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15.0 CULTURAL HERITAGE & ARCHAEOLOGY

15.1 Introduction

This chapter of the EIAR has been prepared by Dr. Charles Mount to assess the significant effects, if any, on the cultural heritage, archaeology and architecture which can reasonably be expected to occur because of the proposal by the Applicant to develop an open-cast mine on lands in Knocknacran West, construct a Cut-and-Cover tunnel under the main Carrickmacross to Kingscourt regional road and a temporary road diversion and new access for the transport of gypsum to the existing processing plant at Knocknacran, and for the transport of overburden and interburden (by haulage truck) to the existing Knocknacran open-cast mine for restoration (collectively known as the Mine Development). The Mine Development will continue to use the processing plant, water treatment facilities and ancillary buildings on the existing Knocknacran site. The Proposed Development will also involve the construction of a Community Sports Complex located in the townlands of Drummond and Knocknacran West, Co. Monaghan. A wide variety of paper, cartographic, photographic and archival sources was consulted. All the lands of the proposed new mining area were visually inspected.

15.2 Legislative and Policy Context

This study which, complies with the requirements of Directive EIA 2014/52/EU. In addition, other statutory, policy, records and guidance documents considered in this study include:

- The Monaghan County Development Plan 2019-25;
- The Record of Monuments and Places (RMP) for County Monaghan;
- The Sites and Monuments Record; and
- The National Inventory of Architectural Heritage.

Monaghan County Development Plan 2019-2025

The Monaghan County Development Plan 2019-2025 is the statutory plan detailing the development objectives/policies of the local authority. The plan includes objectives and policies, relevant to this assessment, i.e., regarding cultural heritage. Chapter 6 of the Development Plan sets out the policies on architectural heritage within the county. The plan states that:

> *"The Planning and Development Act 2000 (as amended) requires planning authorities to include in their development plans, policies and objectives for the protection, enhancement and preservation of the built heritage in their functional area. The principal means of doing this is by maintaining a Record of Protected Structures (RPS); this record identifies buildings of special architectural, historical, artistic, cultural, scientific, social or technical interest."*

The plan notes that:

> *"There are also structures of distinctive traditional styles throughout County Monaghan and whilst these may not be included in the record of protected structures, they reflect the unique local history and character of place. Vernacular structures are extremely vulnerable due to the changing needs and demands of the modern generation. The re-use and adaption of existing buildings is preferable to their demolition. The Government Policy on Architecture*

(2009-2015) seeks that all public authorities address the reuse of existing building stock, regardless of its protected status or otherwise."

The plan includes policies in relation to Protected Structures (see below):

BHP 1 To protect and conserve all structures included in the Record of Protected Structures and to encourage the sympathetic re-use and long-term viability of such structures without detracting from their special interest and character.

BHP 2 To contribute, as appropriate, towards the protection and sympathetic enhancement of archaeological heritage, in particular by implementing the relevant provisions of the Planning and Development Act 2000 (as amended) and the National Monuments Act, 1930 (as amended).

BHP 3 To contribute towards the protection of architectural heritage by complying, as appropriate, with the legislative provisions of the Planning and Development Act 2000 (as amended) in relation to architectural heritage and the policy guidance contained in the Architectural Heritage Protection Guidelines 2011 (and any updated/superseding document).

BHP 4 To maintain and update the Record of Protected Structures in consultation with the National Inventory of Architectural Heritage and to encourage the sympathetic conservation, renewal and repair of these structures.

BHP 5 Planning permission for the demolition of any protected structure shall not be granted except in exceptional circumstances and in accordance with Section 57(10)(b) of the Planning and Development Act 2000.

BHP 6 To ensure that any new development proposed to or in the vicinity of a Protected Structure will complement and be sympathetic to the structure and its setting in terms of its design, scale, height massing and use of materials and to resist any development which is likely to impact on the building's special interest and/ or any views of such buildings and their setting.

BHP 7 To facilitate the retention and sympathetic re-use of protected structures and their settings in circumstances where the proposal is compatible with their character and special interest. In certain instances, land use zoning restrictions and site development standards may be relaxed to secure the conservation and reuse of a protected structure and to provide a viable use for any building which is at risk by virtue of being derelict or vacant.

BHP 8 To require that proposals for works to a protected structure shall be carried out in accordance with best practice as advocated in the Architectural Heritage Protection Guidelines 2011(and any subsequent guidelines).

BHP 9 To use the provisions of the Planning and Development Act 2000 and the Derelict Sites legislation to prevent the loss or deterioration of the County's Architectural Heritage.

BHP 10 The Council aims to conserve the built fabric of the Ulster Canal, Great Northern Railway, historic mills and other industrial heritage structures throughout the county and planning permission will be required for their removal or alteration.

The plan includes policies in relation to Architectural Conservation Areas:

CP 1 To prepare character appraisals for each of the designated Architectural Conservation Areas in the County to guide new development proposals and environmental improvements by identifying the character of each ACA and designing objectives to ensure that their distinctiveness and special interest are preserved and enhanced.

ACP 2 To resist development that would adversely affect the character and appearance of the Architectural Conservation Area. New development or alterations to existing building(s) in an ACA shall reflect the historic architecture in terms of scale, design and materials used. Regard shall be had to any objectives contained in the character appraisals (where applicable).

15.3 Assessment Methodology and Significance Criteria

15.3.1 Methodology

This study which, complies with the requirements of Directive EIA 2014/52/EU, is an assessment of the known or potential cultural heritage resource within a specified area and includes the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, taking into account current knowledge and methods of assessment. It consists of a collation of existing written and graphic information in order to identify the likely context, character, significance and sensitivity of the known or potential cultural heritage, archaeological and structural resource using an appropriate methodology (EPA, 2015 & 2022).

The study involved detailed investigation of the cultural heritage, archaeological, architectural and historical background of the Application Area and the surrounding area. The overall study area extends over an area of ca. 10 square kilometres and is presented in Figure 15.1.

The area was examined using information from:

- The Monaghan County Development Plan 2019-25;
- The Record of Monuments and Places (RMP) for County Monaghan;
- The Sites and Monuments Record;
- The National Inventory of Architectural Heritage;
- Aerial photographs;
- Previous archaeological investigations;
- Cartographic sources; and
- Documentary sources.

A field assessment was carried out on the 29th August 2018 to identify and assess any unknown archaeological sites, structures and previously unrecorded features and possible finds within the application area. Further survey work was undertaken in August 2022 as part of the architectural heritage assessment of the structures to be demolished on the Knocknacran West site.

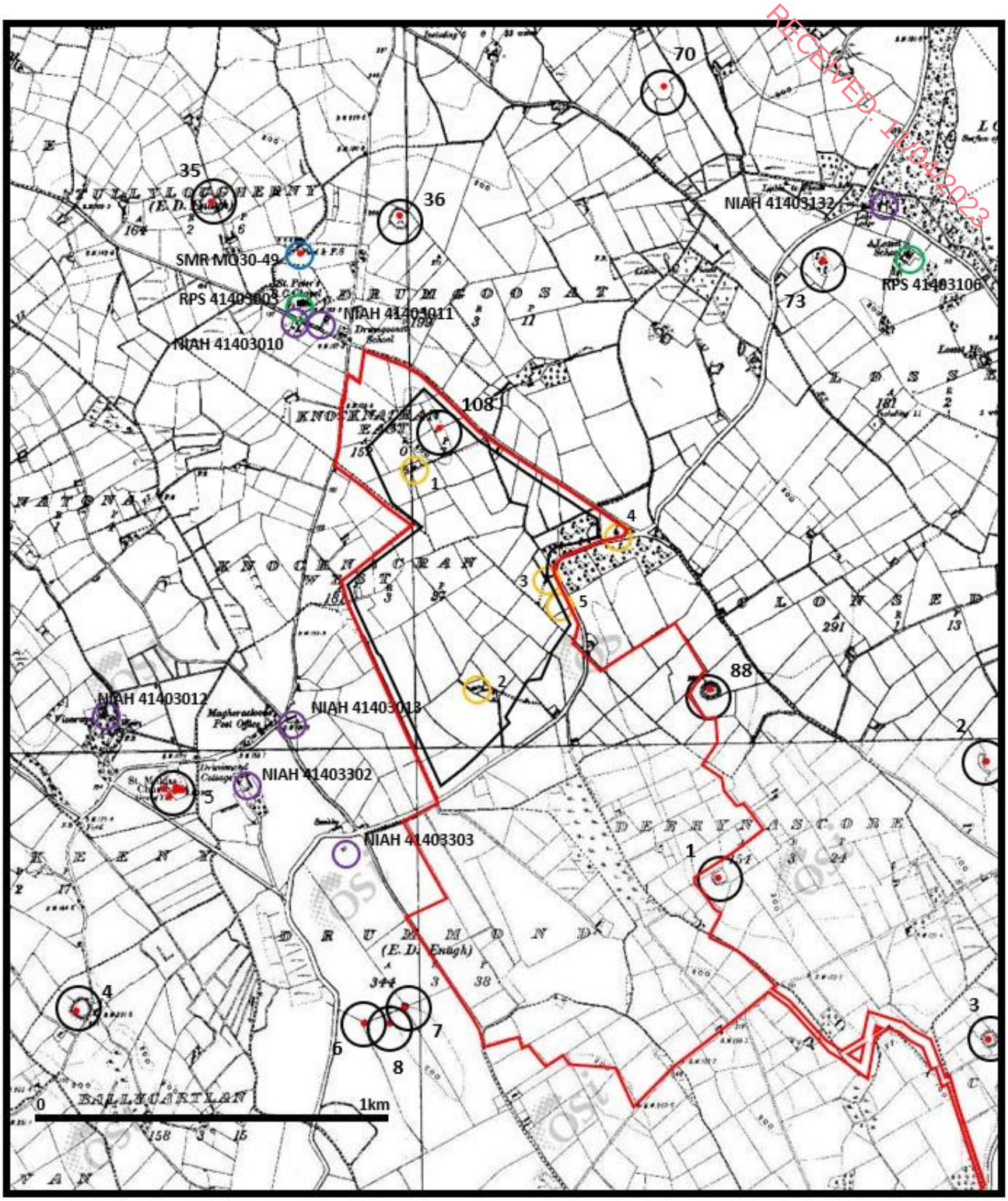

Figure 15.1: The Application Area (red line) superimposed on the Record of Monuments and Places map for Co. Monaghan. Study Area, with black line showing the proposed extraction area. Recorded Monuments indicated by black circles; SMRs by blue circles; Protected Structures by green circles; NIAHs by purple circles. Structures within the Application Area indicated on the 1907 edition of the 6" OS map are indicated by yellow circles.

15.3.1.1 The Record of Monuments and Places (RMP)

This was established under section 12 (1) of the 1994 National Monuments (Amendment) Act and provides that the Minister shall establish and maintain a record of monuments and places. Where the Minister believes there are monuments, such records are to be comprised of a list of monuments and relevant places and a map or maps showing each monument and relevant place in respect of each county in the State. The associated files contain information of Documentary sources and field inspections where these have taken place. Several recorded monuments were noted within the study area. All available information on these sites is provided in Appendix 15.1.

15.3.1.2 Cartographic Sources

This included seventeenth century mapping as well the 1st and 2nd editions of the Ordnance Survey six-inch maps and Documentary sources provide more general historical and archaeological background.

15.3.1.3 The County Development Plan

This notes structures listed for preservation. A field assessment was carried out to identify and assess any unknown archaeological sites, structures and previously unrecorded features and possible finds within the Application Area. An architectural heritage survey was prepared in accordance with the Architectural Heritage Protection Guidelines for Planning Authorities 2011, Appendix B (Architectural Heritage Impact Assessments) and is a written and illustrated account setting out the core data, short description and analysis of the structures proposed for demolition with an impact assessment and recommendations and conclusions (Appendix 15.2).

15.3.1.4 Author

The assessment was prepared by Dr. Charles Mount who has more than thirty years of cultural heritage assessment experience. He holds B.A., M.A. and Ph.D. degrees in archaeology as well as a professional diploma in EIA and SEA Management and is a member of the Institute of Archaeologists of Ireland and a former member of the Discovery Programme.

15.4 Baseline

15.4.1 The Landscape

The proposed Knocknacran West mine is in the townlands of Drumgoosat, and Knocknacran East and West, Co. Monaghan, on OS Six Inch Sheets Nos. 30, 31, 33 & 34, c.4km southwest of the town of Carrickmacross and directly northwest of the R179 road. The soil is fine loamy drift with siliceous stones overlying drift with siliceous stones (Teagasc & EPA, 2015).

15.4.2 Historical and Archaeological Background

The following is a summary of the archaeological and historical development of the study area and the main types of sites and monuments that are known from the surrounding landscape. It is intended to place the types of sites and monuments in the study area in context. The Proposed Development is in the townlands of Drumgoosat, Knocknacran East and West, Enagh, Derrynaglah, Drummond, Derrynascobe and Clontrain, Co. Monaghan in the Barony of Farney and the civil parish of Magheracloone.

15.4.3 Prehistoric Period

The only possible prehistoric monument known from the study area was a mound of unknown type and date in Knocknacran East townland (RMP MO031-108) which was opened in 1860 but nothing was found (Appendix 15.1).

15.4.4 Early Medieval Period

In the Early Medieval period, the study area formed part of the Kingdom of Airgialla, including Louth, Armagh and Monaghan, which was ruled by the Ua Cerbaill family. From the early ninth century, the Fear-Rois sept are noted in the Annals of the Four Masters (AFM) occupying the area of the barony of Farney (Fearnmhaighe). From the later tenth century, the Fear-Rois was ruled by the U Finn family. They are first noted in the Annals (AFM) in 996 when the son of Donnchadh Finn and the Feara-Rois defeated the Ui-Meith. In 1073 the Annals noted the death of Cuchaille Ua Finn, lord of Feara-Rois and in 1109 King Murchadh Ua Maeleachlainn of Meath plundered Feara-Rois, and Killed Ua Finn, lord of Feara-Rois.

15.4.4.1 Settlement

Settlement in the Early Medieval period is indicated by the presence of enclosed farmsteads known as ringforts. There are four ringforts in the study area in Knocknacran East (MO031-088), Derrynascobe (MO034-001), Clonsedy (MO034-002) and Clontrain (MO034-003) townlands and there are enclosures known from Drummond (MO033-006 and MO033-008) and Derrynascobe (MO034-001) townlands that may be the remains of ringforts. Early medieval activity is also indicated by the ecclesiastical site dedicated to the sixth century St. Molua in Camaghy townland (MO033-005001).

15.4.5 Medieval Period

With the arrival of the Anglo-Normans in Leinster and Meath after 1169 the Lords of Meath began to exert authority in Oriel. In 1189, Murrough O'Carroll (Ua Cerbaill), Lord of (Airgialla) Oriel, died and the same year the barony of Farney was granted to Peter Pippard by Prince John (Otway-Ruthven, 1980, p. 70). In 1193, O'Carroll, Lord of Oriel, was hanged by the Anglo-Normans (AFM). By 1200, Pippard had constructed the motte castle at Donaghmoyne to the north of Carrickmacross, but it is not clear if there was any Norman infeudation in the study area or in Farney generally. There are no mottes or moated sites known from the area which would be the usual indicators of activity. It appears the Pippards authority was limited to receiving rents from the area. In the thirteenth century a sub-branch of the O'Carroll's, the MacMahons, rose to prominence in Monaghan and Oriel. In 1273, Eochaich MacMahon became King of Airgialla and from this period the MacMahon's wrested control of Monaghan from the Pippards.

The fifteenth century was characterised by the decline of Anglo-Norman power in Ireland. Part of the response to this was the construction of masonry tower houses which sprang up after King Henry VI introduced a building subsidy of £10 in 1429 (Sweetman, 1999, p. 137). However, as Farney was under MacMahon control there were no Anglo-Normans present to construct them. In 1402, the situation in Farney was recognized by the Dublin Government when the Deputy Lieutenant Le Scrope granted MacMahon the barony of Farney (Otway-Ruthven, 1980, p. 341-2).

15.4.6 Post-medieval Period

In 1575, Queen Elizabeth granted the barony of Farney to the Governor of Ulster, Walter Devereux, 1st Earl of Essex. The Earl of Essex was unable to colonise the area although a fortified house was constructed by the Hadsells at Maghernacloy (Ellis, 1998, p. 303; Brindley 1986, p. 91, No. 1216). His grandson Robert Devereux the third Earl proceeded with the colonisation and constructed a fortress at Drummond Otra in 1628-33 (Brindley

1986, p. 91, No. 1214). After Robert Devereux's death in 1646, the estate fell into co-heiress-ship and the study area came to the Shirley family who held it until the twentieth century (Duffy, 1992).

15.4.7 Designated Structures

The Monaghan County Development Plan 2019-25 was examined as part of the baseline study for this chapter of the EIAR. The review established that there are no Protected Structures situated within the proposed Application Area. There are two buildings listed in the Monaghan County Development Plan situated within the study area (Table 15.1 below and Figure 15.1). The closest Protected Structure is St. Peter and St. Paul's Church (41403003) which is situated c.180 m to the northwest of the application area. The remaining Protected Structure in the study area, Losset School House is a greater distance from the Proposed Development.

Table 15.1: Structures in the study area in the Record of Protected Structures

Number	RPS 41403003
Structure type	St. Peter and St. Paul's Church
Townland	Drumgoosat
Designation	Protected Structure
Data source	Monaghan County Development Plan 2019-25
Perceived Significance:	Regional
Description	Freestanding Roman Catholic barn-style church, dated 1823, with five-bay entrance (south) elevation, with altar situated at north side, having lean-to sacristy to rear (north) elevation, and gabled porches to either end of front elevation. Pitched slate roof having wrought-iron cross gable finials and cast-iron rainwater goods. Smooth rendered walls and plinth, painted stone quoins to south corners. Stone date plaque to front (south) elevation. Pointed-arch window openings having painted stone surround and sill with timber Y-tracery forming twin lights. Square-headed window openings to front porches having painted stone sills and timber windows. Square-headed window opening to sacristy having painted masonry sill and paired six-over-six pane timber sliding sash windows. Square-headed door openings to front porches having timber battened double-leaf doors. Interior has raked timber galleries to east and west end supported by timber posts, marble altar raised on plinth of two steps to centre of north wall. Exposed timber roof structure, tongue-and-groove boarding to soffit. Recessed holy water stoups at base of stairs to south wall. Free-standing cast-iron belfry to south of church, dated 1823. Church set within graveyard and bounded by concrete fencing to east, with rubble stone wall with gate piers and integral steps to south, metal double gate and separate pedestrian gate. Car-park to east.

Number	RPS 41403106
Structure type	Losset School House
Townland	Losset
Designation	Protected Structure
Data source	Monaghan County Development Plan 2019-25
Perceived Significance:	Regional
Description	Detached six bay single storey Tudor revival schoolhouse

15.4.8 Non-designated Structures

The National Inventory of Architectural Heritage (NIAH) which is maintained by the Dept. of Housing, Local Government and Heritage was examined as part of the baseline study for this chapter of the EIAR on the 22nd March 2023. The review established that there are no additional structures situated within the application area. There are seven structures included in the NIAH situated within the study area (Table 15.2 below and Figure

15.1). The closest structure in the NIAH to the proposed application area is a Teacher's House (41403011) which is situated c.121 m to the northwest of the Application Area. The remaining structures in the NIAH in the study area are more distant to the proposed new mining area.

Table 15.2: Undesignated structures near the application area

Number	**41403011**
Structure type	Teacher's House
Townland	Drumgoosat
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance:	Local
Description	Detached three-bay two-storey former teacher's house, built c.1890, having gabled central bay to front (south) elevation, and two-bay single-storey return to rear elevation. Now private dwelling. Pitched slate roof, with red brick gable end chimneystacks with cornices, and with monopitch slate roof to rear return. Snecked dressed stone walls to front elevation, coursed roughly dressed stone walls to side and rear elevations, rubble stone walls to return. Square-headed openings with red brick block-and-start surrounds. Replacement uPVC windows to front and side elevations, one-over-one pane timber sliding sash window with convex horns to rear first floor, timber casement window to rear return. Recent half-glazed timber front door, two concrete steps. Set back from road, standing between national school and Saints Peter and Paul's Church. Recent rubble stone wall and gate piers to site entrance to front (south), hedge to boundary with church (west).
Photos:	-
Number	**41403010**
Structure type	Bell tower/stand
Townland	Drumgoosat
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance:	Local
Description	Freestanding cast-iron bell stand, erected c.1920, to south of church. Comprising four fluted round-plan cast-iron columns with relief anthemion ornamentation. Cast-iron bell. Elaborate bracket system with decorative crosses. Now electronically controlled. Fabricated by M. Byrne, Dublin, with maker's marks. Column bases are set in a raised planting bed with rubble stone wall surround.
Photos:	-
Number	**41403013**
Structure type	Farmyard
Townland	Drummond
Designation	None
Data source	NIAH
Perceived Significance:	Regional
Description	Farmyard complex, built c.1820 on sloping site, comprising three-bay single-storey vernacular house with gabled windbreak to front (south) elevation, with single and two-storey outbuildings attached to west end, and having external staircase to west gable of outbuilding. House later in use as outbuilding, now disused. Pitched slate roof, with brick chimneystack to east gable, and with remains of brick chimneystack to west end of house. Roughcast rendered walls to front and rear, with exposed rubble stone and brick wall to east gable. Square-headed window openings, no windows remaining, with some timber battened fittings. Windbreak has pitched slate roof with timber bargeboards, and square-headed door opening having timber battened door with over-light. Later square-headed opening with sliding metal gate to east end of front elevation. Attached single-bay outbuilding having pitched slate roof, roughcast rendered walls and square-headed opening with sliding metal doors. Two-bay two-storey outbuilding attached to west gable of this,

	having pitched slate roof, whitewashed rubble stone walls, square-headed openings with timber battened shutters and doors. Dogleg external staircase to west gable, with poured concrete treads over rubble stone base
Number	**41403302**
Structure type	Farmyard complex
Townland	Drummond
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance:	Local
Description	Farmyard complex, built c.1800, comprising attached four-bay single-storey house with remains of windbreak with rounded walls, and extensive range of outbuildings. Front elevation of house facing west, with three-bay single-storey outbuilding attached to south gable, with open byre attached to south gable of this, whole forming west range of yard, with single-bay single-storey outbuilding attached to east elevation of outbuilding. Multiple-bay single and two-storey outbuildings forming east range of yard, two-bay two-storey outbuilding to south side, and two-bay single-storey pigsty to north side. Pitched slate roof to house, with red brick chimneystack. Roughcast rendered rubble stone walls. Square-headed window openings, blocked-up on front elevation, having six-over-six pane timber sliding sash windows with exposed box frames on end gable wall. Square-headed panelled timber door opening to front elevation. Single-storey three-bay outbuilding extending to south with pitched corrugated-iron roof, roughcast-rendered rubble stone walls, and square-headed openings with timber fittings. Open byre with monopitch corrugated-iron roof, rubble stone walls, and round-plan rubble stone piers supporting roof. East range and outbuilding to south have pitched corrugated-iron and slate roofs, painted coursed rubble stone walls, and timber fittings. Pigsty has lean-to corrugated iron roof, rubble stone walls, timber fittings, and rubble stone boundary walls. Yard accessed through round-plan piers supporting wrought-iron gate to southwest, additional set of round-plan piers supporting wrought-iron gate accesses fields from northeast corner of yard. Original entrance to Drummond Cottage to northwest of house, no longer in use. Site entrance on main road to south with double-leaf wrought-iron gate, round-plan painted rubble stone walls and flanking walls
Photos:	-
Number	**41403303**
Structure type	Lime kiln
Townland	Drummond
Designation	None
Data source	NIAH
Perceived Significance:	Regional
Description	Square-plan lime kiln, built c.1800, built into bank, recently restored and rebuilt. Roughly dressed stone walls, some dressed snecked new stonework with castellated parapet. Round arch with rusticated voussoirs and keystone to fire opening, rubble stone to soffit. Situated close to crossroads.
Photos:	-
Number	**41403012**
Structure type	Rectory/glebe/vicarage/curate's house
Townland	Camaghy
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance:	Local
Description	Detached three-bay two-storey glebe house over part-raised basement, built 1824, refenestrated c.1880. Now in use as house. Pitched slate roof, with cement rendered gable-end chimneystacks with clay pots, ogee-profile cast-iron gutter, and cast-iron down pipe. Rendered walls having painted quoins. Square-headed window openings with flush reveals,

	and bipartite timber sliding sash windows with moulded mullions and having one-over-one panes with ogee horns. Segmental-headed door opening with double-leaf timber panelled door flanked by sidelights with geometric glazing, with spoked fanlight over and approached by flight of six cut-stone steps with rendered parapet walls. Outbuildings to rear (north) of site. Set back from road served by winding avenue. Mature trees to garden. Curved rubble stone walls and wrought-iron double-leaf gate to site entrance at T-junction in road.
Photos:	-
Number	**41403132**
Structure type	Gate lodge
Townland	Losset
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance:	Local
Description	Detached two-bay single-storey gate lodge with attic storey, dated 1842, having projecting gabled bay to north end of front (west) elevation, forming full-height return to rear, gabled entrance porch to north elevation, lower single-storey addition to rear gable, and recent flat-roofed extension to rear, to south of rear returns. Pitched slate roofs having cut-stone barges and kneelered gables. Red brick and cut-stone chimneystack. Snecked dressed stone walls with tooled stone quoins. Carved stone date plaque to entrance porch gable. Square-headed window openings, some double, some triple-light, having chamfered stone surrounds and mullions. Carved stone label-mouldings to windows to front and south elevations. Some quarry-glazed windows, some fixed timber windows. Square-headed door opening with chamfered stone surround, having recent timber door. Two single-storey outbuildings to rear having pitched slate roofs with cut-stone copings, rubble stone walls, and square-headed openings with some timber fittings. and rubble stone wall enclosure to rear. Set back from road at T-junction on western boundary of Lough Fea estate. Estate entrance to north having cast-iron double-leaf gate, flanked by octagonal-plan cut-stone piers with carved caps, in turn flanked by matching railings on cut-stone plinth walls. Site entrance to south having wrought-iron double-leaf gate, cut-stone piers with rubble stone caps, flanked by rubble stone boundary walls.
Photos:	-

15.4.9 Field Inspection

On the 29th August 2018, fieldwork was carried out to identify any additional upstanding non-designated structures within the proposed new mining area. This involved assessing all upstanding structures that are marked on the 1907 edition of the six-inch Ordnance Survey mapping within the application area (Figure. 15.1). A follow up survey was carried out in August 2022 on the identified former houses and sheds onsite and on the additional occupied 1980s bungalow. The detailed findings of this architectural survey are provided in Appendix 15.2. There are four structures situated in this area which are not of heritage interest (Table 15.3).

Table 15.3: Undesignated structures near the application area

Number	**1**
Structure type	Farmhouse & shed
Townland	Knocknacran East
Designation	None
Data source	1907 edition of the six-inch Ordnance Survey map
Perceived Significance:	None
Description	Derelict three-bay single-storey farmhouse with porch, corrugated roof and single chimney.
Photos:	Plates 1 & 5 (Appendix 15.2) & Plate 15.1 (Appendix 15.3)

Number	2
Structure type	Farmhouse
Townland	Knocknacran West
Designation	None
Data source	1907 edition of the six-inch Ordnance Survey map
Perceived Significance:	None
Description	Two-bay two storey derelict farmhouse with porch, slate roof and single chimney. Concrete extension at east. No heritage interest.
Photos:	Plate 6 (Appendix 15.2) & Plate 15.2 (Appendix 15.3)
Number	**3**
Structure type	Cottage
Townland	Knocknacran West
Designation	None
Data source	1907 edition of the six-inch Ordnance Survey map
Perceived Significance:	None
Description	Two-bay two storey farmhouse with slate roof and two chimneys. Shed at east. No heritage interest.
Photos:	Plate 13 (Appendix 15.2) & Plate 15.3 (Appendix 15.3)
Number	**4**
Structure type	House (Shirley House)
Townland	Knocknacran East
Designation	None
Data source	1907 edition of the six-inch Ordnance Survey map
Perceived Significance:	None
Description	Two-bay two storey derelict stone house with slate roof and two chimneys. Window openings sealed with blocks. No heritage interest.
Photos:	Plate 15.4 (Appendix 15.3)
Number	**5**
Structure type	1980s Bungalow
Townland	Knocknacran East
Designation	None
Data source	1907 edition of the six-inch Ordnance Survey map
Perceived Significance	None
Description	Bungalow granted planning permission 23/07/1981, Planning application details ref: 81396 Monaghan County Council. Bungalow, built after 1981, comprising bungalow with attached garage. One-storey four-bay bungalow, with a single-bay single-storey garage attached to north end gable. Pitched wessex-tiled roof, with chimneystack. Concrete walls. Square-headed window openings with uPVC windows. Square-headed doorway with door. With garden.
Photos	Plate 22 Appendix 15.2

15.4.10 Recorded Monuments

Examination of the Record of Monuments and Places for Co. Monaghan indicated that the site of one Recorded Monument that has been completely removed is located within the proposed Knocknacran West site (Figure 15.1, Appendix 15.1). This is described in the Record of Monuments as: MO031-108---- Knocknacran East Barrow – unclassified. Located on a NE-facing slope. It is depicted as a small circular enclosure (diam. ca. 5 m) on the 1834 edition of the OS 6-inch map where it is described in italic lettering as a 'mound'. It is depicted similarly on the 1907 edition of the map. According to Shirley (1879, p. 536) the mound at Knocknacran East was opened in 1860 but nothing was found. It has been quarried away. The location of this possible monument has been removed by extraction as stated in the RMP.

The closest Recorded Monument to the new extraction area, RMP MO030-036---- Drumgoosat Ringfort – rath, is situated 0.35 km northeast of the proposed application area (Figure 15.1 and Appendix 15.1). The remaining Recorded Monuments in the study area are further distant from the proposed new mining area.

15.4.11 Sites and Monuments Record

Examination of the Sites and Monuments Record (SMR) which is maintained by the Department of Housing, Local Government and Heritage on 22nd March 2023 indicated that there are no SMRs included within the study area.

There is one additional SMR within the study area external to the proposed new mining area (Figure 15.1 and Appendix 15.4). SMR MO030-049---- Drumgoosat Mass-rock is situated 0.3 km northwest of the Site.

15.4.12 Cartographic Sources

The Ordnance Survey 1st and 3rd edition six-inch maps and the first edition 25-inch maps of the application area were examined. The analysis did not indicate any previously unrecorded archaeological sites in the application area or vicinity.

15.4.13 Place Name Evidence

The place names were extracted from the cartography to facilitate the search for structures and monuments and small finds, to help identify any unrecorded monuments or structures, to search for any published papers and documents related to the study area and to assist in the study of the historical development of the area. The English translations of the townland names of the study presented below are based on the Placenames Database of Ireland. The placenames mainly refer to topographical features, land cover and proprietors (Table 15.4 below).

The English placenames presented here are originally sourced from interpretations of John O'Donovan during fieldwork in the county in the summer of 1835 which have then been compiled and presented on logainmneacha.ie.

Table 15.4: Townland Names of the Study Area

Townland	English Translation
Aghafin	White field
Ballycartlan	Cartlan's pass
Camaghy	Crooked field
Corduff	Black hill
Corrybrackan	O'Bracken's round hill
Clonsedy	Lawn of the arrow
Derrynaglagh	Oakwood of the sticks
Derrynascobe	Oakwood of the brooms
Drumgoosat	Ridge of danger
Drummond	Ridge
Knocknacran East & West	Wooded hill
Lisnakeeny	Fair ringfort
Losset	Tilled land
Stranatona	River bottom land
Tonaneeve	Arable field
Tullyloughherny	Hill of the rushes

Analysis of the nomenclature was provided by An Brainse Logainmneacha/The Placenames Branch (Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media (DTCAGSM)) in June 2022 for the townlands the Proposed Development sits within. This is presented in Table 15.3, below. Table 15.3 also provides the townland names in both English and Irish. A map of the townlands is provided in Figure 15.2, below.

Table 15.3: Townlands within the application site and analysis of nomenclature

Townland Name (English)	Townland Name (Irish)	Analysis of Nomenclature
Derrynascobe	*Doire na Scuab*	The (oak-)wood of the brushes, brooms See Doire na gCleath
Drumgoosat	*Droim Guasachta*	(The) ridge of danger, peril
Knocknacran East	*Cnoc na Cranncha Thoir*	The hill of the wooded place crannach, gen. cranncha < crann “tree” + -ach, locative suffix
Knocknacran West	*Cnoc na Cranncha Thiar*	The hill of the wooded place crannach, gen. cranncha < crann “tree” + -ach, locative suffix
Drummond	*An Droimann*	The ridge
Enagh	*An tEanach*	The marsh
Clontrain	*Cluain Tréin*	The wet pasture of Tréan?; wet pasture of (the) strong man? The second element is uncertain. It may be the genitive form of the personal name Tréan (a variant genitive form of which is found in the Irish name of New Ross in County Wexford, Ros Mhic Thriúin “the elevated land of Mac Thriúin (the son of Tréan)”) or the common noun tréan “strong person”. If so, note again the lack of the definite article. The first element, cluain, is discussed in depth by Dr. Pádraig Ó Cearbhaill in Logainmneacha na hÉireann III: Cluain i logainmneacha Thiobraid Árann. The translation we favour in the Placenames Branch is “wet pasture”.
Derrynaglah	*Doire na gCleath*	The (oak-)wood of the spears, poles? The word cleath (gen. pl. id.) has several meanings. Compare with Doire na Scuab above; it is probable that these two woods were named after the primary use once made of the raw materials found in them.

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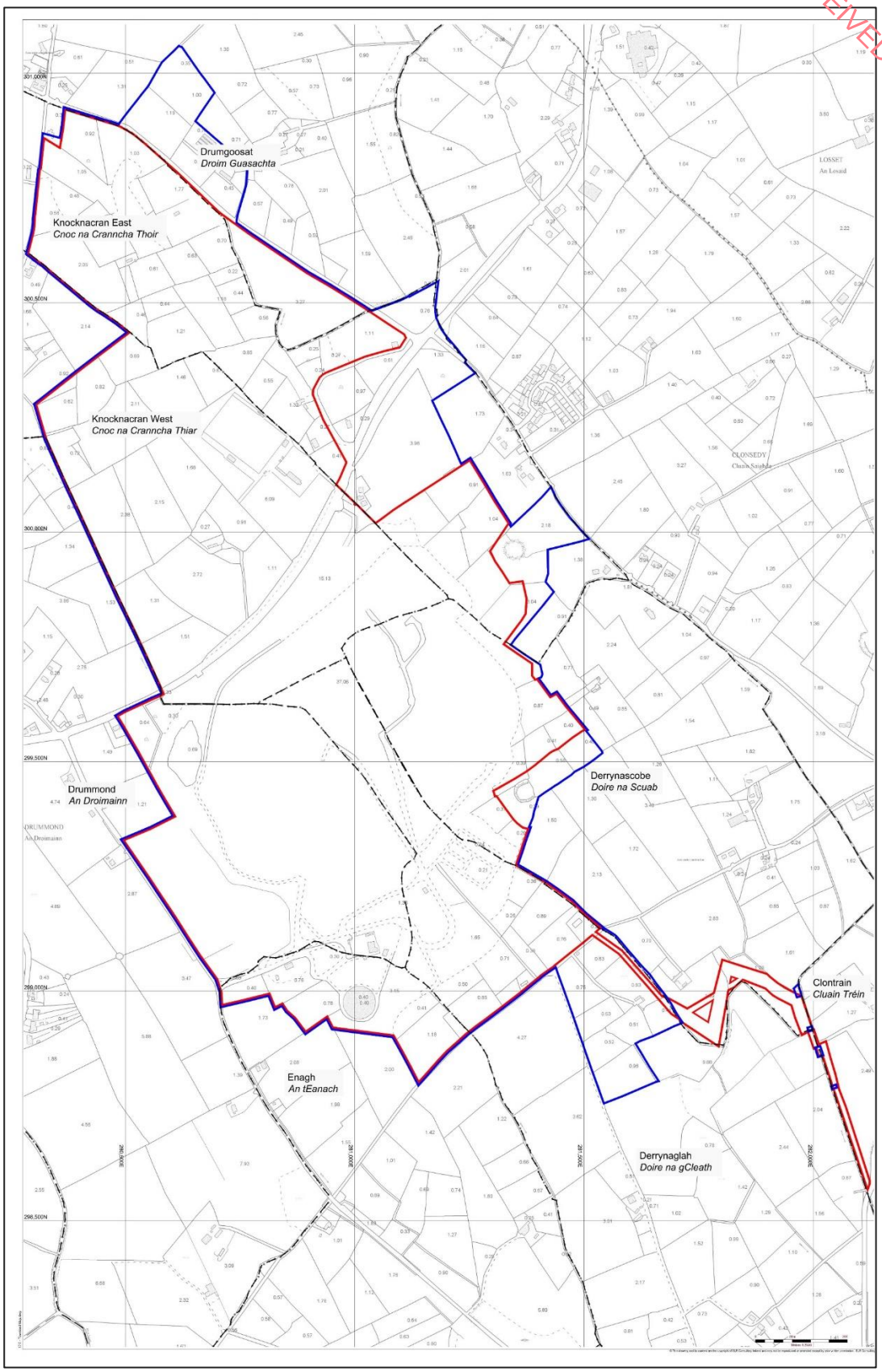
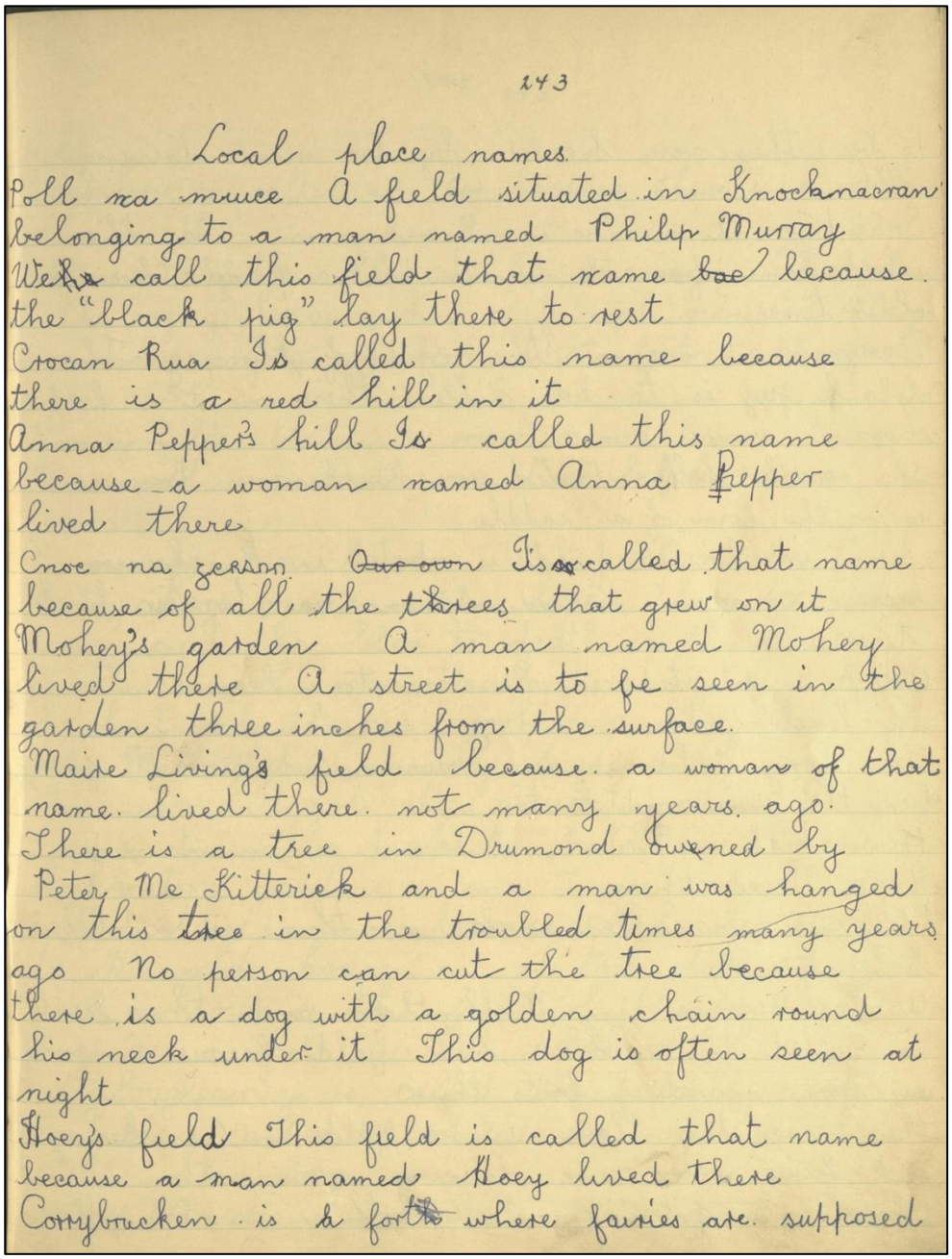


Figure 15.2: Townlands within the application site

15.4.13.1 Minor Placenames – Field Names

Engagement has been had with An Brainse Logainmneacha/The Placenames Branch (DTCAGSM), Cumann Gaelach Mhuineacháin and Meitheal Logainm (national database for minor placenames) to establish if there is a published record of the minor field names in the Application Site.

Consideration was also given to duchas.ie (Volume 0929, pages 243-244), where a record from Drumgoosat School is available on minor place names in the area (Figure 15.5, Figure 15.4 and Figure 15.5). No map is provided with this record, and it is not possible to geolocate the historical field names and the current fields and directly compare names and changes.



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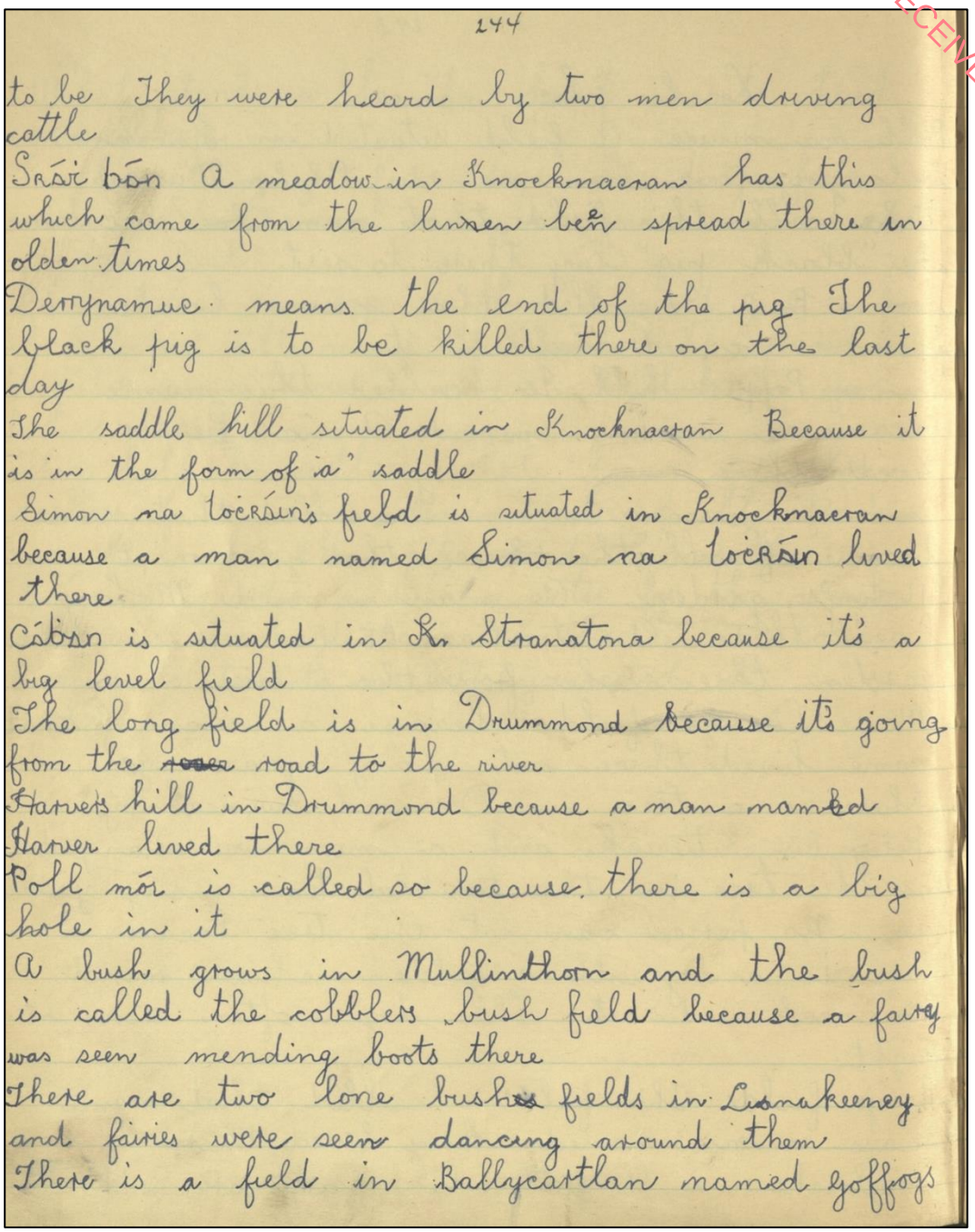
Local place names.

Poll na muice A field situated in Knocknacran belonging to a man named Philip Murray
We ~~ha~~ call this field that name ~~bae~~ because the "black pig" lay there to rest
Crocan Rua Is called this name because there is a red hill in it
Anna Pepper's hill Is called this name because a woman named Anna Pepper lived there
Cnoc na gcrann ~~Dar-own~~ Is ~~as~~ called that name because of all the ~~th~~trees that grew on it
Mohey's garden A man named Mohey lived there A street is to be seen in the garden three inches from the surface.
Maire Living's field because a woman of that name lived there not many years ago.
There is a tree in Drumond owned by Peter Mc Kitterick and a man was hanged on this ~~tree~~ in the troubled times many years ago No person can cut the tree because there is a dog with a golden chain round his neck under it This dog is often seen at night
Hoey's field This field is called that name because a man named Hoey lived there
Corrybracken is a ~~fo~~ where fairies are supposed

Figure 15.3: Page 243 of Drumgoosat National School Volume 0929 (https://www.duchas.ie/en/cbes/4723812/4715608 © National Folklore Collection, UCD)



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to be They were heard by two men driving cattle

Sráid bán A meadow in Knocknacran has this which came from the linen ben spread there in olden times

Derrynamue means the end of the pig The black pig is to be killed there on the last day

The saddle hill situated in Knocknacran Because it is in the form of a" saddle

Simon na Loicáin's field is situated in Knocknacran because a man named Simon na Loicáin lived there

Cábán is situated in Kr Stranatona because it's a big level field

The long field is in Drummond because it's going from the ~~road~~ road to the river

Harvets hill in Drummond because a man named Harver lived there

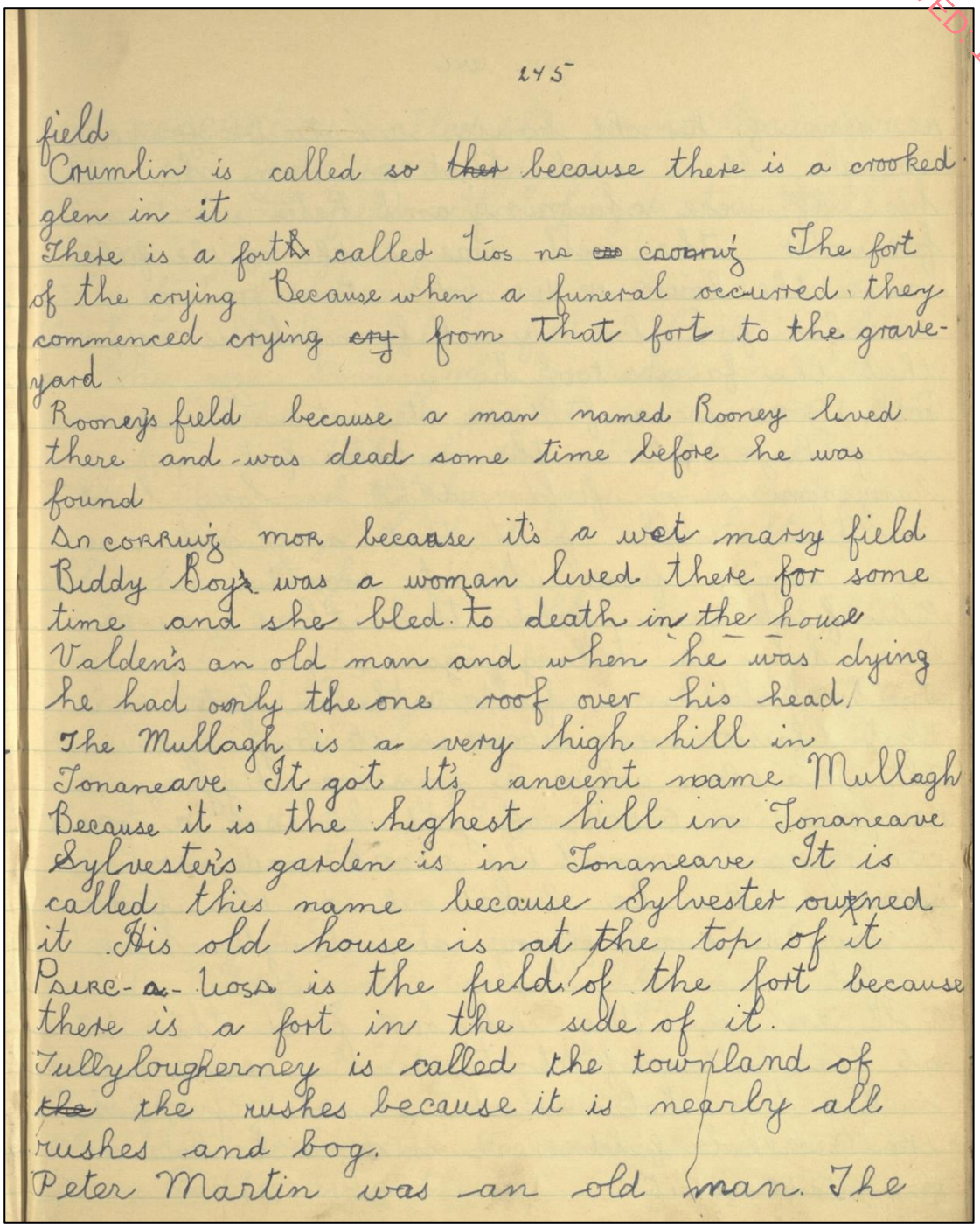
Poll mór is called so because there is a big hole in it

A bush grows in Mullinthom and the bush is called the cobblers bush field because a fairy was seen mending boots there

There are two lone bush fields in Lisnakeeney and fairies were seen dancing around them

There is a field in Ballycartlan named goffogs

Figure 15.4: Page 244 of Drumgoosat National School Volume 0929 (https://www.duchas.ie/en/cbes/4723812/4715609 © National Folklore Collection, UCD)



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field
Crumlin is called so ~~that~~ because there is a crooked glen in it
There is a forth called Lios na ~~[illegible]~~ crorrig The fort of the crying Because when a funeral occurred they commenced crying ~~cry~~ from that fort to the graveyard
Rooney's field because a man named Rooney lived there and was dead some time before he was found
An corrig mor because it's a wet marsy field
Biddy Boy's was a woman lived there for some time and she bled to death in the house
Valden's an old man and when he was dying he had only the one roof over his head
The Mullagh is a very high hill in Tonaneave It got it's ancient name Mullagh Because it is the highest hill in Tonaneave
Sylvester's garden is in Tonaneave It is called this name because Sylvester owned it His old house is at the top of it
Pairc-a-Lios is the field of the fort because there is a fort in the side of it.
Tullylougherney is called the townland of ~~the~~ the rushes because it is nearly all rushes and bog.
Peter Martin was an old man. The

Figure 15.5: Page 245 of Drumgoosat National School Volume 0929 (https://www.duchas.ie/en/cbes/4723812/4715610 © National Folklore Collection, UCD)

The Applicant has engaged with a local landowner to provide detail of the minor field names at present, where possible. A map of the field numbers is shown in Figure 15.6, below.

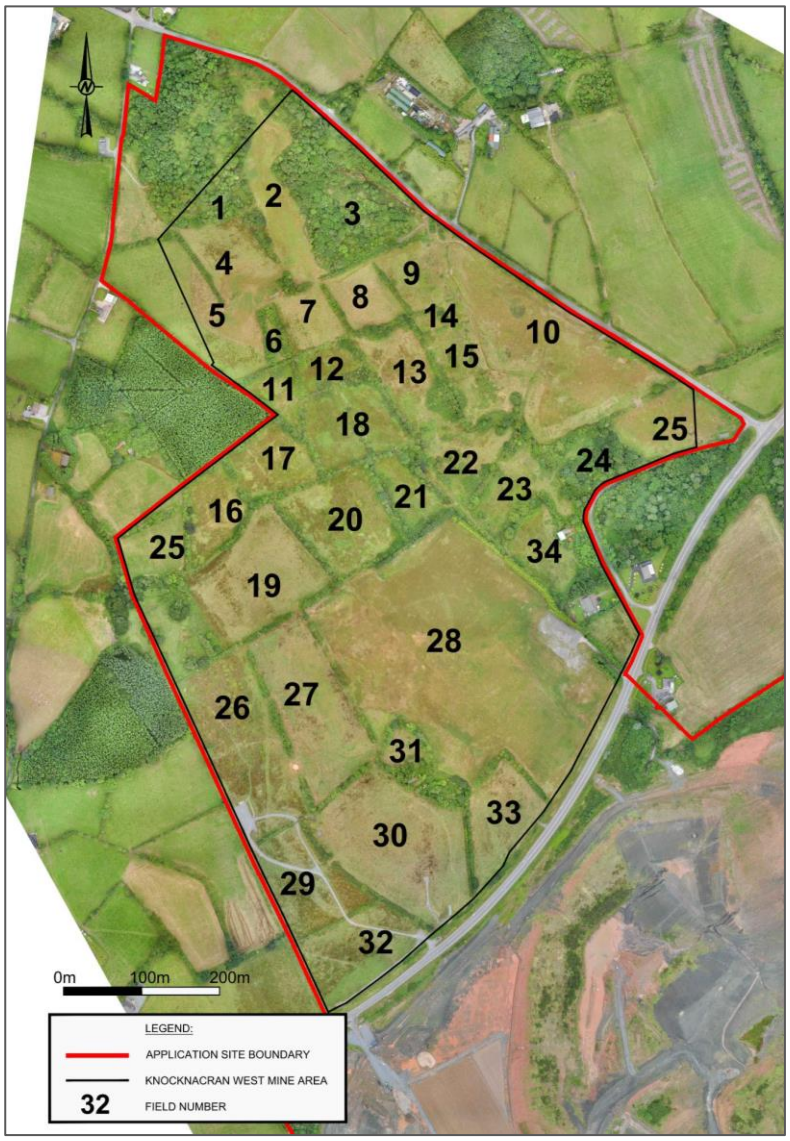

Figure 15.6: Field numbers for fields on the Knocknacran West site

Field names have been collated for 18 of the 34 fields on the Knocknacran West site and are as shown in Table 15.4.

Table 15.4: Field names within the site

Field Number	Field Name
6	"Collins Place"
7	"Collins Place"
8	"Collins Place"
9	"Phil Murray's Place"
10	"Barney Finn's Place"
11	"Collins Place"
12	"Collins Place"
13	"Phil Murray's Place"
14	"Phil Murray's Place"

15	"Phil Murray's Place"
18	"Rushy Field"
21	"The Little Field"
22	"The Three Cornered Field"
23	"The Middle Field"
24	"The Wee Meadow" or "Keenan's Meadow"
25	"The Old Quarry"
28	"Brigee Kelly's Place"
31	"Brigee Kelly's Place"

The field names indicate that naming is predominantly tied to former ownership (13 fields). In cases where the name describes an attribute of the field, this appears to be related to size ("The Little Field"), location ("The Middle Field") or quality of the land ("Rushy Field"). Field names also indicate that fields have historically been associated with quarrying (No. 25 "The Old Quarry").

Comparison between the Drumgoosat historical record for field names within the area and the current names for fields within the area, shows "Murray" is common between the records, although it cannot be determined if this refers to the same field as the Drumgoosat school records do not provide geolocations. It is also apparent that is a general theme in how fields are named over time. Fields have historically been named after either people who lived there or an obvious attribute specific to the field (e.g. quality such as it's a small/little field).

The record of the field names, both those the current record collected from a local source and the historical Drumgoosat National School record, have been provided to Logainm and Cumann Gaelach Mhuineacháin during the compilation of this EIAR (Appendix 15.5). Minor field name records shown in Table 15.4, above, have been uploaded to Meitheal Logainm (https://meitheal.logainm.ie/en/) and can be publicly viewed on this mapping resource for minor field names (Figure 15.7).

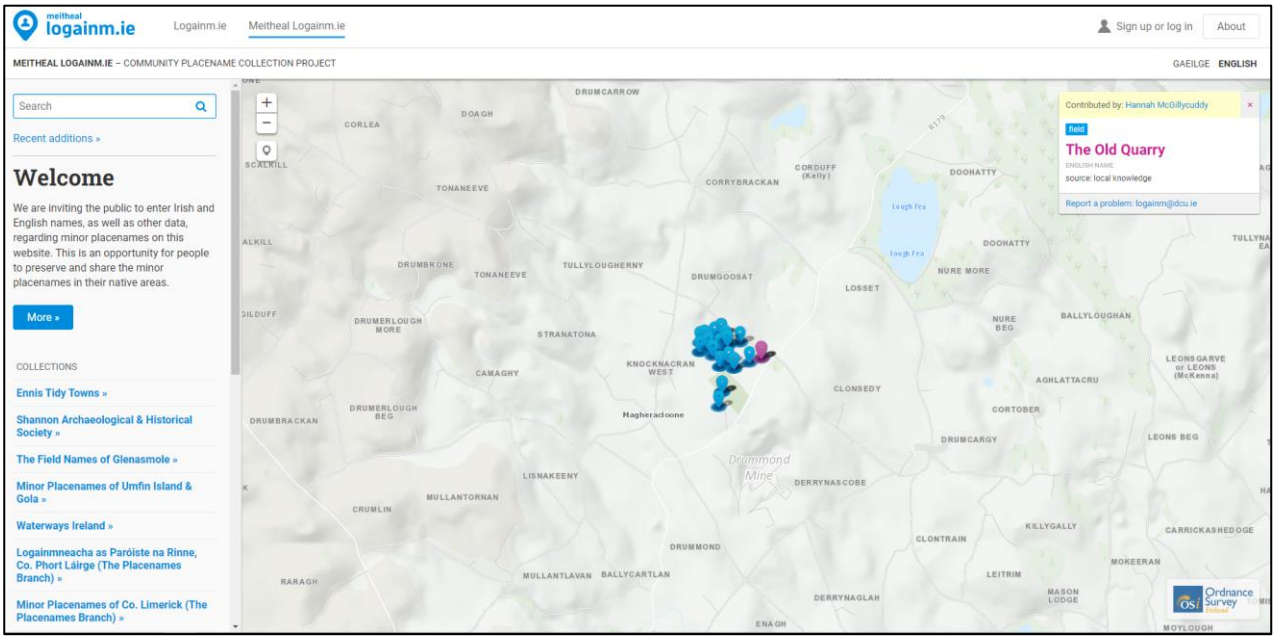

Figure 15.7: Field records for the site available to be viewed publicly at https://meitheal.logainm.ie/en/)

15.4.14 Aerial Photographs

Examination of the Ordnance Survey 1995, 2000 and 2005 imagery as well as Google earth imagery from 2006, 2009, 2010, 2011, 2013, 2015, 2018, 2019, 2020, 2021 and 2022, and Bing imagery did not indicate any additional cultural heritage sites in the study area.

15.4.15 Other Sources

Examination of archaeological corpus works on prehistoric artefacts (Harbison, 1969; Eogan, 1965, 1983, 2000; Kavanagh, 1991; Simpson, 1990), and pottery (O'Ríordáin and Waddell, 1993) and Iron Age material (Raftery, 1984) revealed no artefacts found from the study area.

15.4.16 Previous Assessments Archaeological Investigations

Examination of the excavations database of Irish excavation reports indicated that there have been no licensed archaeological investigations carried out in the Site. The existing Knocknacran Mine development was the subject of a cultural heritage assessment prepared by Brady Shipman Martin that formed part of an EIS accompanying a planning application in 2003 (Reg. No. 03/578). The assessment concluded that the proposal would not significantly affect the archaeology or architecture of the area. A further cultural heritage assessment prepared by Brady Shipman Martin formed part of an EIS accompanying a planning application for an extension in 2007 (Reg. No. 07/430). The assessment concluded that the proposed development would not impact archaeology or architecture. The assessment recommended that Recorded Monuments MO034-001 and MO031-088 each be protected by a 30 m buffer zone. The recommendation was incorporated in condition 9 of the subsequent grant of planning permission which states:

> *9. 'A 30 metre buffer zone should be established around recorded monument MO034-001 and MO034-088. These areas should be then hard fenced from all construction works'.*

15.4.17 Field Inspection

A field inspection was carried out on the 29th August 2018 of the proposed Knocknacran West site. No additional items of heritage, structures or monuments were identified:

Area 1 - This is an area of overgrown and inaccessible woodland that obscures a clear view of the ground (Plate 15.6).

Area 2 - Long narrow-shaped south sloping field of pasture enclosed by mature hedges with trees (Plate 15.7). There was no visible indication of any archaeological or cultural heritage material.

Area 3 - Irregularly shaped area of woodland that obscures a clear view of the ground (Plate 15.8). There was no visible indication of any archaeological or cultural heritage material.

Area 4 - Rectangular-shaped northwest sloping field of pasture enclosed by mature hedges with trees (Plate 15.9). There was no visible indication of any archaeological or cultural heritage material.

Area 5 - Irregularly shaped northwest sloping field of pasture enclosed by mature hedges with trees (Plate 15.10). There was no visible indication of any archaeological or cultural heritage material.

Area 6 - Narrow field of rough south sloping pasture enclosed by mature hedged and trees (Plate 15.11). There was no visible indication of any archaeological or cultural heritage material.

Area 7 - Rectangular-shaped south sloping field of pasture enclosed by mature hedges with trees (Plate 15.12). There was no visible indication of any archaeological or cultural heritage material.

Area 8 - Rectangular -shaped south sloping field of pasture enclosed by mature hedges with trees (Plate 15.13). There was no visible indication of any archaeological or cultural heritage material.

Area 9 - Rectangular-shaped east sloping field of rough pasture enclosed by low banks and mature hedges with trees (Plate 15.14). There was no visible indication of any archaeological or cultural heritage material.

Area 10 - Large triangular-shaped southeast sloping field of rough pasture enclosed by low banks and mature hedges with trees (Plate 15.15). There was no visible indication of any archaeological or cultural heritage material.

Area 11 - Triangular-shaped south sloping field of rough pasture enclosed by mature hedges with trees (Plate 15.16). There was no visible indication of any archaeological or cultural heritage material.

Area 12 - Rectangular-shaped south sloping field of rough pasture enclosed by low banks and mature hedges with trees (Plate 15.17). There was no visible indication of any archaeological or cultural heritage material.

Area 13 - Trapezoidal-shaped southeast sloping field of rough pasture enclosed by low banks and mature hedges with trees (Plate 15.18). There was no visible indication of any archaeological or cultural heritage material.

Area 14 - Rectangular-shaped overgrown undulating field of rough pasture enclosed by low banks and mature hedges with trees (Plate 15.19). There was no visible indication of any archaeological or cultural heritage material.

Area 15 – Sub-rectangular-shaped south sloping field of rough pasture enclosed by ditches, banks and mature hedges with trees and divided by a fence (Plate 15.20). There was no visible indication of any archaeological or cultural heritage material.

Area 16 - Trapezoidal-shaped northeast sloping field of pasture enclosed by low banks and mature hedges with trees (Plate 15.21). There was no visible indication of any archaeological or cultural heritage material.

Area 17 - Pentagonal-shaped south sloping field of rough pasture enclosed by low banks and mature hedges with trees (Plate 15.22). There was no visible indication of any archaeological or cultural heritage material.

Area 18 - Trapezoidal-shaped southeast sloping field of rough pasture enclosed by banks and mature hedges with trees (Plate 15.23). There was no visible indication of any archaeological or cultural heritage material.

Area 19 - Trapezoidal -shaped northeast sloping field of pasture enclosed by low stoney banks and mature hedges with trees (Plate 15.24). There was no visible indication of any archaeological or cultural heritage material.

Area 20 – Sub-rectangular-shaped northwest sloping field of rough pasture enclosed by banks and ditched hedges with trees (Plate 15.25). There was no visible indication of any archaeological or cultural heritage material.

Area 21 - Trapezoidal-shaped southeast sloping field of rough pasture enclosed by banks and mature hedges with trees (Plate 15.26). There was no visible indication of any archaeological or cultural heritage material.

Area 22 - Triangular-shaped undulating field of rough pasture enclosed by banks and mature hedges with trees (Plate 15.27). There was no visible indication of any archaeological or cultural heritage material.

Area 23 - Trapezoidal-shaped northeast sloping field of pasture enclosed by banks and mature hedges with trees (Plate 15.28). There was no visible indication of any archaeological or cultural heritage material.

Area 24 - Rectangular-shaped southwest sloping area of woodland that obscures a clear view of the ground (Plate 15.29). There was no visible indication of any archaeological or cultural heritage material.

Area 25 - Lozenge-shaped south sloping field of rough pasture enclosed by fences, banks and mature hedges with trees (Plate 15.30). There was no visible indication of any archaeological or cultural heritage material.

Area 26 - Trapezoidal-shaped west sloping field of pasture enclosed by ditches, banks and mature hedges with trees (Plate 15.31). There was no visible indication of any archaeological or cultural heritage material.

Area 27 - Trapezoidal-shaped west sloping field of pasture enclosed by low banks and mature hedges with trees (Plate 15.32). There was no visible indication of any archaeological or cultural heritage material.

Area 28 – This area experienced a series of subsidence events after fieldwork was completed. Remediation works have taken place to infill the crownholes, all facilities associated with the GAA/Community centre including pitches have been removed and the land regraded. There was no visible indication of any archaeological or cultural heritage material at the time of the field inspection.

Area 29 - Concave-shaped west sloping field of rough pasture enclosed by low banks and ditched mature hedges with trees (Plate 15.33). There was no visible indication of any archaeological or cultural heritage material.

Area 30 - Pentagonal-shaped south sloping field of pasture enclosed by low banks and mature hedges with trees (Plate 15.34). There was no visible indication of any archaeological or cultural heritage material.

Area 31 - Oval-shaped flat field of pasture enclosed by low banks and mature hedges with trees (Plate 15.35). There was no visible indication of any archaeological or cultural heritage material.

Area 32 - Sub rectangular-shaped south sloping field of pasture enclosed by low banks and mature hedges with trees (Plate 15.36). There was no visible indication of any archaeological or cultural heritage material.

Area 33 - Bell-shaped southwest sloping field of pasture enclosed by low banks and mature hedges with trees (Plate 15.37). There was no visible indication of any archaeological or cultural heritage material.

Area 34 - Trapezoidal-shaped southeast sloping field of pasture enclosed by low banks and mature hedges with trees (Plate 15.38). There was no visible indication of any archaeological or cultural heritage material.

15.5 Key Characteristics of the Proposed Development

15.5.1 Construction Phase: Community Sports Complex

During this phase, the existing Community Sports Complex will be further developed. The initial phase of this development has been constructed (Reg. Ref.: 20/365), and the next phase will involve extending the Community Sports Complex with the construction of two further playing pitches, one with a perimeter running track, an all-weather pitch, a new club building, including a sports hall, a handball alley, changing rooms & toilets, a viewing gallery, a part-covered grandstand, additional parking and associated siteworks.

15.5.2 Construction Phase: Mine Development

During this phase:

- Screening berms will be constructed;
- Planting (including bolstering and retention of the existing perimeter hedgerow which sits in front of/is separate to the proposed planted screening berms) will be carried out;
- Perimeter fencing, will be installed;
- One residential house and three unoccupied houses and sheds on the Knocknacran West site will be demolished;
- A temporary diversion of the R179 will be constructed to maintain traffic flow while a Cut-and-Cover Tunnel is constructed;
- The existing processing plant on the existing Knocknacran Open-Cast Mine site will be refurbished; and
- A new vehicular entrance will be constructed to the existing mine site from the L4816.

15.5.3 Operational Phase: Community Sports Complex

During this phase, the Community Sports Complex will be in operation.

15.5.4 Operational Phase: Mine Development

The proposed phased extraction of gypsum by open-cast mining methods at Knocknacran West is to expose and recover the Upper and Lower gypsum seams/units remaining after the cessation of mining from the Drumgoosat underground mine in 1989. In parallel, the Knocknacran Mine will be backfilled and remediated to near original ground.

During this phase:

- Open Cast mining will be undertaken to allow extraction (by blasting) of the gypsum form the Drumgoosat Underground mine area closed in 1989. The gypsum extracted will maintain a continuous supply of mineral as the current Knocknacran mine will be exhausted as the new mine is brought into operation;

- The proposed Mine Development amounts to the replacement of the loss of mining of gypsum at the Knocknacran Open-Cast Mine with the mining of gypsum at Knocknacran West Open-Cast Mine. Both mine sites are comparable in size and nature of operations;
- Overburden and Interburden will be stripped (by mechanical means) to expose the gypsum mineral at the new Knocknacran West Open cast mine.; The stripping of the site will be undertaken in a series of campaigns at specific times and last for defined periods of time (typically < 6 months) over the life of the proposed Mine Development. The stripping earthworks will be undertaken by a specialist contractor following a tender process.
- The gypsum remaining in the former Drumgoosat Underground Mine will be extracted by open-cast mining methods;
- The existing Knocknacran Mine will be restored to near original ground level;
- The existing plant site will process and despatch the extracted gypsum;
- The existing Drumgoosat dewatering pump, will be relocated to an existing borehole on the Knocknacran West site to continue to provide dewatering;
- The depth of mining will be to a depth to which the base of the Lower gypsum bed extends in the open-cast area which is ca. - 53 m OD; and
- The stripping of the site will be undertaken in a series of campaigns at specific times and last for defined periods of time (typically < 6 months) over the life of the proposed Mine Development. The stripping earthworks will be undertaken by a specialist contractor following a tender process.

15.5.5 Restoration/Closure Phase: Community Sports Complex

There is no proposal to close the Community Sports Complex development, and this phase is therefore not applicable in this case.

15.5.6 Restoration/Closure Phase: Mine Development

During this phase:

- The new Knocknacran West site will be returned to grassland and a waterbody;
- The existing Knocknacran site will be returned to near original ground level;
- The existing Knocknacran Plant site will be partially dismantled whereby mine plant is removed; and
- In line with the current CRAMP it is presented that here that a suitable developer would be sought to utilise the general buildings existing on the existing site for a light industrial usage into the future. This would be subject to a future developer seeking the necessary permits for continuation of use and change of use from mining to a non-mining use.

15.6 Potential Effects

15.6.1 Potential Effects: Construction Phase: Community Sports Complex

The site that the proposed Community Sports Complex is located on, consists of former backfilled lands within the Knocknacran Mine open-cast extraction area (on the eastern side). Recent construction works have been undertaken on the site area (including in the west) to build the initial development permitted under Reg. Ref 20/365. No archaeological or cultural heritage features were identified during the course of works. As much of the site consists of either backfilled material emplaced during the phased restoration of the extraction area within Knocknacran Mine, or has undergone construction earthworks, there is no in-situ archaeology likely to be unknown or undiscovered at this site.

There will be no direct impacts or effects on any known items of archaeology, cultural heritage or buildings of heritage interest at the Community Sports Complex site.

There will be no indirect impacts or effects on any known items of archaeology, cultural heritage or buildings of heritage interest at the Community Sports Complex site.

15.6.2 Potential Effects: Construction Phase: Mine Development

15.6.2.1 Potential Effects: Construction Phase: Mine Development: Designated Structures

There are two buildings listed in the Monaghan County Development Plan situated within the study area (Table 15.5 below and Figure 15.1). The closest Protected Structure is St. Peter and St. Paul's Church (41403003) which is situated c.180 m to the northwest of the application area. This is considered too distant to be directly or indirectly impacted or affected by the proposed construction phase of the Mine Development. The remaining Protected Structure in the study area, Losset School House is a greater distance from the proposed Mine Development and is also considered too distant to be directly or indirectly impacted or affected by it.

No underground mine workings underlie these structures and subsidence is scoped out.

Table 15.5: Structures in the study area in the Record of Protected Structures and potential effects

Number	RPS 41403003
Structure type	St. Peter and St. Paul's Church
Townland	Drumgoosat
Designation	Protected Structure
Data source	Monaghan County Development Plan 2019-25
Perceived Significance	Regional
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Number	**RPS 41403106**
Structure type	Losset School House
Townland	Losset
Designation	Protected Structure
Data source	Monaghan County Development Plan 2019-25

Perceived Significance	Regional
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.

15.6.2.2 Potential Effects: Construction Phase: Mine Development: Non-designated Structures

There are seven structures included in the NIAH situated within the study area (Table 15.6 below and Figure 15.1). The closest structure in the NIAH to the proposed Mine Development is a Teacher's House (41403011) which is situated c.121 m to the northwest. This is considered too distant to be directly or indirectly impacted by the construction phase of proposed Mine Development. The remaining structures in the NIAH in the study area are more distant and are also considered too distant to be directly or indirectly impacted by the construction phase of the proposed Mine Development.

No underground mine workings underlie these structures and subsidence is scoped out.

Table 15.6: Non-designated structures near the application area and potential effects

Number	**41403011**
Structure type	Teacher's House
Townland	Drumgoosat
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance	Local
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Photos	-
Number	**41403010**
Structure type	Bell tower/stand
Townland	Drumgoosat
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance	Local
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Photos	-
Number	**41403013**
Structure type	Farmyard
Townland	Drummond
Designation	None
Data source	NIAH
Perceived Significance	Regional
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required

Significance & quality of impact	None
Number	**41403302**
Structure type	Farmyard complex
Townland	Drummond
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance	Local
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Photos	-
Number	**41403303**
Structure type	Lime kiln
Townland	Drummond
Designation	None
Data source	NIAH
Perceived Significance	Regional
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Photos	-
Number	**41403012**
Structure type	Rectory/glebe/vicarage/curate's house
Townland	Camaghy
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance	Local
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Photos	-
Number	**41403132**
Structure type	Gate lodge
Townland	Losset
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance:	Local
Type of impact:	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Photos:	-

15.6.2.3 Potential Effects: Construction Phase: Mine Development: Undesignated Structures within the Knocknacran West site

On the 29th August 2018 and the 23rd August 2022, fieldwork was carried out to identify any additional upstanding non-designated structures within the proposed Knocknacran West site which will be demolished during the construction phase. This involved assessing all upstanding structures that are marked on the 1907 edition of the six-inch Ordnance Survey mapping within the application area (Figure. 15.1). There are five structures situated in this area which are not of heritage interest, four of which will be demolished but have no heritage interest (Table 15.7). The four structures to be demolished are considered in full detail in Appendix 15.2, presented below is a summary table of the findings.

Table 15.7: Undesignated structures within the Knocknacran West site

Number	**1**
Structure type	Farmhouse & sheds
Townland	Knocknacran East
Designation	None
Data source	1907 edition of the six-inch Ordnance Survey map
Perceived Significance	None.
Type of impact	Demolition
Assessment	The structure is one of many later nineteenth century farmhouses in the region and 1 is considered to have low rarity value. The structure has one outbuilding. The structure is set away from the main road, is not visible from the main road and makes no contribution to the streetscape. The structure survives as an abandoned ruin that has lost most of the original elements that contribute to any special interest. The structure is ruined reducing its condition value and compromising its survival as an upstanding structure. The structure has fallen into a ruined condition and could not be re-used and adapted without extensive conservation works thereby reducing its use value. The architectural special interest of structure 1 is generally low. The potential contribution that structure 1 makes to its setting is considerably reduced by its abandoned and ruined condition and the fact that it is not visible from the local road. Appendix 15.2.
Significance & quality of Effect	Permanent negative impact on structure. As the architectural special interest of structure 1 is generally low the effect will not be significant (Imperceptible).
Embedded Mitigation	Preservation by record is provided in Appendix 15.2
Photos	Plates 1 & 5 (Appendix 15.2) & Plate 15.1 (Appendix 15.3)
Number	**2**
Structure type	Farmhouse
Townland	Knocknacran West
Designation	None
Data source	1907 edition of the six-inch Ordnance Survey map
Perceived Significance	None
Type of impact	Demolition
Assessment	The structure is one of many pre-1836 farmhouse in the region and is considered to have low rarity value. The structure is a deteriorating ruin. The structure is associated with a small rectangular grassed area and two outbuildings. The structure is set away from the main road, but is visible from the main road in the distance at south making a minor contribution to the streetscape.

	The structure survives as an abandoned shell that has lost, most of its window frames, most of its render, internal fittings and furnishings and other original elements that contribute to any special interest. The structure has fallen into a partly ruined condition reducing its condition value and compromising its survival as an upstanding structure. The outbuilding to the east has lost part of its roof and is in a worse condition. The structure is also located just to the south-west of an area of land subsidence. It is unlikely the structure could be re-used and adapted. The architectural special interest of structure 2 is generally low. Due to the structures siting over mine workings and its proximity to land subsidence it is unlikely the structure could be re-used and adapted. Appendix 15.2.
Significance & quality of Effect	The proposed development will have a permanent negative impact on structure 2. However, as the architectural special interest of structure 2 is generally low the impact will not be significant (Imperceptible).
Embedded Mitigation	Preservation by record is provided in Appendix 15.2
Photos	Plate 6 (Appendix 15.2) & Plate 15.2 (Appendix 15.3)
Number	**3**
Structure type	Cottage
Townland	Knocknacran West
Designation	None
Data source	1907 edition of the six-inch Ordnance Survey map
Perceived Significance:	None
Type of impact:	Demolition
Assessment	The structure is one of many pre-1836 farmhouse in the region, and is considered to have low rarity value. The structure is situated within its own curtilage with several outbuildings. The structure is set away from the main road, is not visible from the main road and makes no contribution to the streetscape. The structure does not retain its original windows and doors. The structure is in fair condition. Structures 3 is also located just to the north-east of an area of land subsidence. The structure is located above an area of underlying mine workings and there is a general subsidence risk associated with the land on this site. Due to health and safety concerns it is unlikely the structure could be re-used and adapted. The architectural special interest of structure 3 is generally low to moderate. The potential contribution that structure 3 makes to its setting is reduced by the fact that it is not visible from the local road. Due to the structures siting over mine workings and its proximity to land subsidence it is unlikely the structure could be re-used and adapted. Appendix 15.2.
Significance & quality of Effect	The proposed development will have a permanent negative impact on structure. However, as the architectural special interest of structure 13 is generally low to moderate the impact will not be significant (Imperceptible).
Embedded Mitigation	Preservation by record is provided in Appendix 15.2.
Photos	Plate 13 (Appendix 15.2) & Plate 15.3 (Appendix 15.3)
Number	**4**
Structure type	House (The Shirley House)
Townland	Knocknacran East
Designation	None
Data source	1907 edition of the six-inch Ordnance Survey map
Perceived Significance	None

Type of impact	None. This structure will not be directly impacted by the proposal. It is known as a location for roosting bats (Chapter 6.0 refers) and the roof will be repaired to create a more favourable habitat for bats.
Assessment	No heritage interest.
Significance & quality of effect	Imperceptible
Mitigation	No mitigation required.
Photos	Plate 15.4 (Appendix 15.3)
Number	**5**
Structure type	1980s Bungalow
Townland	Knocknacran East
Designation	None
Data source	1907 edition of the six-inch Ordnance Survey map
Perceived Significance	None
Type of impact	Demolition.
Assessment	Bungalow granted planning permission 23/07/1981, Planning application details ref: 81396 Monaghan County Council. The structure is a standard 1980s bungalow. Therefore structure 5 is considered to have low rarity value. The structure is situated on its own within its own curtilage with low ensemble value. The structure retains its fittings and furnishings but these are mass-produced and are not considered to be of architectural interest. The structure is in good condition. Structure 5 is a standard 1980s bungalow and has no architectural special interest.
Significance & quality of effect	The proposed development will have a permanent negative impact on structure. However, as the structure has no architectural special interest the impact will not be significant (Imperceptible)
Mitigation	No mitigation required.
Photos	Plate 22 (Appendix 15.2)

15.6.2.4 Potential Effects: Construction Phase: Mine Development: Recorded Monuments

The closest Recorded Monument to the Mine Development, RMP MO030-036---- Drumgoosat Ringfort – rath, is situated 0.35 km northeast of the proposed application area (Figure 15.1 and Appendix 15.1). This monument is considered to be too distant to be directly or indirectly impacted or affected by the construction phase of the Mine Development. The remaining Recorded Monuments in the study area are further distant from the proposed Mine Development and are considered to be too distant to be directly or indirectly impacted or affected by the proposal. No underground mine workings underlie these monuments and subsidence is scoped out.

15.6.2.5 Potential Effects: Construction Phase: Mine Development: Undesignated Monuments

Examination of the Sites and Monuments Record (SMR) which is maintained by the Department of Housing, Local Government and Heritage on 6th October 2020 indicated that there are no undesignated monuments included within the proposed Mine Development.

There is one additional undesignated monument included within the study area external to the proposed new mining area (Figure 15.1 and Appendix 15.4). SMR MO030-049---- Drumgoosat Mass-rock is situated 0.3 km northwest of the proposed Mine Development and is considered to be too distant to be directly or indirectly impacted or affected by the proposal during the construction phase.

No underground mine workings underlie these monuments and subsidence is scoped out.

15.6.2.6 Potential Effects: Construction Phase: Mine Development: Cartographic Sources

The Ordnance Survey 1st and 3rd edition six-inch maps and the first edition 25-inch maps of the application area were examined. The analysis did not indicate any previously unrecorded archaeological sites in the application area or vicinity. It is considered that there will be no direct or indirect impact or effect from the proposal during the construction phase.

15.6.2.7 Potential Effects: Construction Phase: Mine Development: Place Names

As part of the construction phase of the Mine Development, works will modify and remove existing fields which are located in the proposed temporary diversion area. Removal of material from existing fields will also occur during the construction of perimeter screening berms on the Knocknacran West site. The impact of this will result in the loss, partially or fully of existing field.

Place name evidence for fields within the area shows that names are not static and have evolved over time as fields have changed and generations have grown. As part of the baseline work, field names have been compiled for both current and historical names within the area. In the case of the existing field names, which are georeferenced, these names have been uploaded to Meitheal Logainm and can be viewed online at https://meitheal.logainm.ie/en/. The field names have also been given to Cumann Gaelach Mhuineacháin who have previously expressed interested in compiling records of the minor placenames within County Monaghan. The duchas record from Drumgoosat National School has been given to both Meitheal Logainm and Cumann Gaelach Mhuinecháin for reference.

While the construction phase will initiate the removal of fields within the Knocknacran West site, a record of the field names has been recorded and given to public sources to allow the evolution of the cultural landscape to be preserved. The historical and current record of the field names in the area indicate that the names are generational, not static and have evolved over time as the ownership and quality of the fields have evolved and the landscape has changed. It is considered that there will be a neutral effect from the proposal during the construction phase on minor place names.

15.6.3 Potential Effects: Operational Phase: Community Sports Complex

Once the Community Sports Complex is constructed, there would be no further impacts or effects on the archaeology or cultural heritage beneath/at the site and this has been scoped out of the assessment.

15.6.4 Potential Effects: Operational Phase: Mine Development

15.6.4.1 Potential Effects: Operational Phase: Mine Development: Designated Structures

There are two buildings listed in the Monaghan County Development Plan situated within the study area (Table 15.8 below and Figure 15.1). The closest Protected Structure is St. Peter and St. Paul's Church (41403003) which is situated c.180 m to the northwest of the application area. This is considered too distant to be directly or indirectly impacted or affected by the proposed operational phase of the Mine Development. The remaining Protected Structure in the study area, Losset School House is a greater distance from the proposed Mine Development and is also considered too distant to be directly or indirectly impacted or affected by it.

No underground mine workings underlie these structures and subsidence is scoped out.

Table 15.8: Structures in the study area in the Record of Protected Structures and potential effects

Number	RPS 41403003
Structure type	St. Peter and St. Paul's Church
Townland	Drumgoosat
Designation	Protected Structure
Data source	Monaghan County Development Plan 2019-25
Perceived Significance	Regional
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Number	**RPS 41403106**
Structure type	Losset School House
Townland	Losset
Designation	Protected Structure
Data source	Monaghan County Development Plan 2019-25
Perceived Significance	Regional
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.

15.6.4.2 Potential Effects: Operational Phase: Mine Development: Non-designated Structures

There are seven structures included in the NIAH situated within the study area (Table 15.9 below and Figure 15.1). The closest structure in the NIAH to the proposed Mine Development is a Teacher's House (41403011) which is situated c.121 m to the northwest. This is considered too distant to be directly or indirectly impacted by the operational phase of proposed Mine Development. The remaining structures in the NIAH in the study area are more distant and are also considered too distant to be directly or indirectly impacted by the operational phase of the proposed Mine Development.

No underground mine workings underlie these structures and subsidence is scoped out.

Table 15.9: Non-designated structures near the application area and potential effects

Number	41403011
Structure type	Teacher's House
Townland	Drumgoosat
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance	Local
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Photos	-
Number	**41403010**
Structure type	Bell tower/stand
Townland	Drumgoosat
Designation	None
Data source	National Inventory of Architectural Heritage

Perceived Significance	Local
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Photos	-
Number	**41403013**
Structure type	Farmyard
Townland	Drummond
Designation	None
Data source	NIAH
Perceived Significance	Regional
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required
Significance & quality of impact	None
Number	**41403302**
Structure type	Farmyard complex
Townland	Drummond
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance	Local
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Photos	-
Number	**41403303**
Structure type	Lime kiln
Townland	Drummond
Designation	None
Data source	NIAH
Perceived Significance	Regional
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Photos	-
Number	**41403012**
Structure type	Rectory/glebe/vicarage/curate's house
Townland	Camaghy
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance	Local
Type of impact	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Photos	-

Number	41403132
Structure type	Gate lodge
Townland	Losset
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance:	Local
Type of impact:	None
Significance & quality of effect	None
Mitigation	No mitigation required.
Photos:	-

15.6.4.3 Potential Effects: Operational Phase: Mine Development: Undesignated Structures within the Knocknacran West site

There is one structure (Structure 4) situated on the Knocknacran West site which is not of heritage interest (Table 15.10). This is the Shirley House, and the structure sits outside the open-cast extraction area and will not be directly impacted by the operational phase of the Mine Development.

No underground mine workings underlie this structure and subsidence is scoped out.

Table 15.10: Undesignated structures within the Knocknacran West site

Number	4
Structure type	House (The Shirley House)
Townland	Knocknacran East
Designation	None
Data source	1907 edition of the six-inch Ordnance Survey map
Perceived Significance	None
Type of impact	None. This structure will not be directly impacted by the proposal.
Assessment	No heritage interest.
Significance & quality of effect	None
Mitigation	No mitigation required.
Photos	Plate 15.4

15.6.4.4 Potential Effects: Operational Phase: Mine Development: Recorded Monuments

The closest Recorded Monument to the Mine Development, RMP MO030-036---- Drumgoosat Ringfort – rath, is situated 0.35 km northeast of the proposed application area (Figure 15.1 and Appendix 15.1). This monument is considered to be too distant to be directly or indirectly impacted or affected by the operational phase of the Mine Development. The remaining Recorded Monuments in the study area are further distant from the proposed Mine Development and are considered to be too distant to be directly or indirectly impacted or affected by the proposal.

No underground mine workings underlie these structures and subsidence is scoped out.

15.6.4.5 Potential Effects: Operational Phase: Mine Development: Undesignated Monuments

Examination of the Sites and Monuments Record (SMR) which is maintained by the Department of Housing, Local Government and Heritage on 22nd March 2023 indicated that there are no undesignated monuments included within the proposed Mine Development.

There is one additional undesignated monument included within the study area external to the proposed new mining area (Figure 15.1 and Appendix 15.4). SMR MO030-049---- Drumgoosat Mass-rock is situated 0.3 km northwest of the proposed Mine Development and is considered to be too distant to be directly or indirectly impacted or affected by the proposal during the operational phase.

No underground mine workings underlie these structures and subsidence is scoped out.

15.6.4.6 Potential Effects: Operational Phase: Mine Development: Cartographic Sources

The Ordnance Survey 1st and 3rd edition six-inch maps and the first edition 25-inch maps of the application area were examined. The analysis did not indicate any previously unrecorded archaeological sites in the application area or vicinity. It is considered that there will be no direct or indirect impact or effect from the proposal during the operational phase.

No underground mine workings underlie these structures and subsidence is scoped out.

15.6.4.7 Potential Effects: Operational Phase: Mine Development: Place Names

As part of the operational phase of the Mine Development, fields (ca. 33) will be removed within the Knocknacran Wet Mine during its operational life. The impact of this will result in the loss, partially or fully of existing fields.

Place name evidence for fields within the area shows that names are not static and have evolved over time as fields have changed and generations have grown. As part of the baseline work, field names have been compiled for both current and historical names within the area. In the case of the existing field names, which are georeferenced, these names have been uploaded to Meitheal Logainm and can be viewed online at https://meitheal.logainm.ie/en/. The field names have also been given to Cumann Gaelach Mhuineacháin who have previously expressed interested in compiling records of the minor placenames within County Monaghan. The duchas record from Drumgoosat National School has been given to both Meitheal Logainm and Cumann Gaelach Mhuinecháin for reference.

While the operational phase will remove the fields within the Knocknacran West site, a record of the field names has been recorded and given to public sources to allow the evolution of the cultural landscape to be preserved. The historical and current record of the field names in the area indicate that the names are generational, not static and have evolved over time as the ownership and quality of the fields have evolved and the landscape has changed. In addition, during the operational life, fields will be created within the Knocknacran Mine site and will contribute to the evolving landscape of cultural heritage within the locality. It is considered that there will be a neutral effect from the proposal during the operational phase on minor place names.

15.6.5 Potential Effects: Closure/Restoration Phase: Community Sports Complex

No closure phase is proposed for the Community Sports Complex, therefore the potential impact and effect from this phase is not considered further. It is scoped out for consideration in this phase.

15.6.6 Potential Effects: Closure/Restoration Phase: Mine Development

Once the Mine Development is in restoration and there are no further earthworks or blasting, there would be no further potential impacts or effects on the archaeology or cultural heritage beneath/at the site and this has been scoped out of the assessment.

15.7 Mitigation and Management

15.7.1 Mitigation and Management: Construction Phase: Community Sports Complex

- Works will be undertaken in line with any conditions set by MCC.

15.7.2 Mitigation and Management: Construction Phase: Mine Development

15.7.2.1 Embedded Mitigation: Construction Phase: Mine Development

- Preservation by record is provided in Appendix 15.2 for the four undesignated structures to be demolished on the Knocknacran West site; and
- Preservation by record has been provided by uploading minor placename records identified in this planning application process to Meitheal Logainm (https://meitheal.logainm.ie/en/) and to Cumann Gaelach Mhuineacháin.

15.7.2.2 Additional Mitigation: Construction Phase: Mine Development

Embedded mitigation has already been outlined in Section 15.7.2.1, the following additional mitigation will be implemented onsite:

- Works will be undertaken in line with any conditions set by MCC; and
- Due to the possibility of the survival of previously unknown subsurface archaeological deposits or finds within the unstripped part of the new proposed mining area (Knocknacran West Mine site) in all areas except No. 28 in the application area should be archaeologically monitored during topsoil stripping.

15.7.3 Mitigation and Management: Operational Phase: Community Sports Complex

- Works will be undertaken in line with any conditions set by MCC.

15.7.4 Mitigation and Management: Operational Phase: Mine Development

15.7.4.1 Embedded Mitigation: Operational Phase: Mine Development

- Preservation by record has been provided by uploading minor placename records identified in this planning application process to Meitheal Logainm (https://meitheal.logainm.ie/en/) and to Cumann Gaelach Mhuineacháin.

15.7.4.2 Additional Mitigation: Operational Phase: Mine Development

- Works will be undertaken in line with any conditions set by the EPA in the IE Licence; and

- Due to the possibility of the survival of previously unknown subsurface archaeological deposits or finds within the unstripped part of the new proposed mining area (Knocknacran West Mine site) in all areas except No. 28 topsoil-stripping in the application area should be archaeologically monitored.

15.8 Monitoring

15.8.1 Monitoring: Construction Phase: Community Sports Complex

- Any monitoring associated with authorisation or consents will be incorporated into the Main Contractor's Construction Management Plan (CMP) and will be adhered to.

15.8.2 Monitoring: Construction Phase: Mine Development

- Monitoring will be undertaken in line with any conditions set by MCC;
- The appointed Main Contractor will be required to produce a final CMP, which will document appropriate procedures and responsible persons when working on the site; and
- Any monitoring associated with authorisation or consents will be incorporated into the Main Contractor's CMP and will be adhered to.

15.8.3 Monitoring: Operational Phase: Community Sports Complex

There is no proposed monitoring of the Community Sports Complex during this phase and so this is not considered further.

15.8.4 Monitoring: Operational Phase: Mine Development

There is no specific monitoring required for this phase of the Mine Development. Should any minor place names or archaeological features be identified during this phase, they will be recorded.

15.8.5 Monitoring: Restoration/Closure Phase: Community Sports Complex

There is no proposed decommissioning of the Community Sports Complex and so this is not considered further here.

15.8.6 Monitoring: Restoration/Closure Phase: Mine Development

As no new earthworks areas will occur during this phase, there is no need to monitor this phase and so this is not considered further.

15.9 Residual Effects

15.9.1 Community Sports Complex

Once the identified mitigation measures, appropriate design standards and operational infrastructure management plans are adhered to, it is considered that any effects surrounding the Community Sports Complex will be **Not Significant.**

15.9.2 Mine Development

As the consideration of the effects of the Mine Development on the archaeological and cultural heritage component during the construction, operational and closure phases has not identified a significant effect, it is considered here that any residual effects would also be **Not Significant.**

15.10 Cumulative Effects

15.10.1 The Project – Community Sports Complex and Mine Development

The construction phases of the Community Sports Complex and the Mine Development occur simultaneously, however, no significant effects are identified for either and it is considered that there is no potential for cumulative effects on archaeology and cultural heritage between the two developments.

The construction phase of the Community Sports Complex overlaps with the first year of the operational life of the Mine Development, however, no significant effects are identified for either and it is considered that there is no potential for cumulative effects between the two developments.

The operational phase of the Community Sports Complex and Mine Development overlap, however, no significant effects are identified for either and it is considered that there is no potential for cumulative effects between the two developments.

The restoration phase of the mine development overlaps with the operational phase of the Community Sports Complex, however, no significant effects are identified for either and it is considered that there is no potential for cumulative effects between the two developments.

15.10.2 The Project and Other Offsite Projects

Drummond Mine and the Project occur within the same gypsum deposit. Drummond Mine is an underground mine while the proposed Mine Development will be an open-cast, a former open-cast and a sports complex. Given the geographical distance between the two active extraction areas (i.e. the two mines) and the fact that Drummond Mine is permitted only to 2032, there is no likelihood of a cumulative effect between the two developments on archaeology and cultural heritage.

Other extractive industries near to the Application Site include four operational quarries within a radius of 5 km of the Project. These are; (i) Cormey Clay Pit, Breedon Brick Ltd.'s open-cast clay quarry, located ca. 1.5 km south of the Site. (ii) an associated site located ca. 4 km south of the Site, (iii) Limestone Industries Ltd limestone quarry, located ca. 2 km west of the Site, and (iv) Roadstone Barley Hill open-cast quarry located ca. 4 km southeast of the Site. As these facilities are not within the immediate vicinity of the Site (ca. 1 km), there will be no cumulative effect on either a known or a previously unknown archaeological feature.

Losset ADN Materials Ltd. have a planning application under consideration (Reg. Ref. 22/254) and are located ca. 1 km to the north of the Project site. Based on a review of the current planning file data (to date 27th March 2023), this development does not appear to require any excavation into soils beyond foundational level. There will be no cumulative effect on archaeology and cultural heritage due to this development.

Other existing developments in the area include a mushroom farm, chicken farm, school and industrial/commercial facilities (e.g. car dealership). There will be no cumulative effect between the Project and these developments.

The cumulative effects are deemed **Not Significant** between the Project and other offsite Projects.

15.11 'Do-Nothing' Scenario

In a 'Do Nothing' Scenario, the Knocknacran West Mine would not be mined out and by association, the former Drumgoosat underground workings would not be removed at all. The Knocknacran Mine site would close once the resource is extracted and in line with the existing closure plan (Reg. Ref. 17/217) resulting in a mixed use of agricultural lands and a waterbody onsite. The proposed Community Sports Complex would not be further expanded and would remain as currently constructed.

15.12 Difficulties Encountered

No particular difficulties were encountered in the assessment.

15.13 References

- Brindley, A. (1986) 'Archaeological Inventory of Co. Monaghan'. Dublin.
- Department of Housing, Local Government and Heritage and Wordwell (2023) 'Database of Irish Excavation Reports'. Available at: https://excavations.ie/ (Accessed: 22 March 2023).
- Department of Housing, Local Government and Heritage (2023) 'National Inventory of Architectural Heritage'. Available at: https://www.buildingsofireland.ie/ (Accessed: 22 March 2023).
- Duffy, P. J. (1992) 'Assisted emigration from the Shirley estate 1843-54'. Clogher Record, XIV (2). Available at: https://mural.maynoothuniversity.ie/1321/ (Accessed: 28 March 2023).
- Ellis, S.G. (1998) 'Ireland in the Age of the Tudors 1447-1603'. London: Routledge.
- Environmental Protection Agency (2015) 'Advice Notes for Preparing Environmental Impact Statement - Draft'.
- Environmental Protection Agency (2022) 'Guidelines on the information to be contained in Environmental Impact Assessment Report'. Available at: https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf (Accessed: 13 March 2023).
- Eogan, G. (1965) 'Catalogue of Irish Bronze Swords'. Dublin.
- Eogan, G. (1983) 'Hoards of the Irish Later Bronze Age'. Dublin.
- Eogan, G. (2000) 'The Socketed Bronze Axes in Ireland (Prähistorische Bronzefunde, abteilung IX, band 22)'. Stuttgart: Steiner.
- European Union (2014) 'Directive 2014/52/EU of the European Parliament and of the Council, amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment'. Official Journal of the European Union. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0052&from=EN (Accessed: 13 March 2023).
- Harbison, P. (1969) 'The axes of the Early Bronze Age in Ireland'. Prähistorische Bronzefunde, abteilung IX, band 1.
- Irish Statute Book (1994) 'National Monuments (Amendment) Act'. Office of the Attorney General. Available at: https://www.irishstatutebook.ie/eli/1994/act/17/enacted/en/print (Accessed: 13 March 2023).
- Kavanagh, R. M. (1991) 'A reconsideration of razors in the Irish earlier Bronze Age'. JRSAI 121, pp. 77-104.
- Meitheal Loganim – Community Placename Project. Available at https://meitheal.logainm.ie/en/ (Accessed: 14 March 2023).
- Monaghan County Council (2019) 'Monaghan County Development Plan 2019 - 2025'. Available at: https://monaghan.ie/planning/wp-content/uploads/sites/4/2019/04/Monaghan-County-Development-Plan-2019-2025-%E2%80%93-Written-Statement.pdf (Accessed: 13 March 2023).

- National Monuments Service (1996) 'Record of Monuments and Places: County Monaghan Recorded Monuments Protected under Section 12 of the National Monuments (Amendment) Act, 1994'. Available at: https://www.archaeology.ie/publications-forms-legislation/record-of-monuments-and-places (Accessed: 13 March 2023)
- National Monuments Service (2021) 'Archaeological Survey of Ireland - The Sites and Monuments (SMR) Database'. Available at: https://www.archaeology.ie/archaeological-survey-ireland (Accessed: 13 March 2023).
- O'Ríordáin, B. and Waddell J. (1993) 'The Funerary Bowls and vases of the Irish Bronze Age'. Galway: Galway University Press for the National Museum of Ireland.
- Otway-Ruthven, A.J. (1980) 'A History of Medieval Ireland'. London: Ernest Benn.
- Raftery, B. 1984. La Tène in Ireland. Marburg: Veroffentlichung des Vorgeschichtlichen Seminars.
- Shirley, E. P. (1879) 'The History of the County of Monaghan'. London: Pickering and Co.
- Simpson, D.D.A. (1990) 'The stone battle axes of Ireland'. JRSAI 120, pp. 5-40.
- Sweetman, D. (1999) 'The Medieval Castles of Ireland'. Dublin.
- Teagasc and Environmental Protection Agency (2015) 'Irish Soil Information System'. Available at: http://gis.teagasc.ie/soils/map.php (Accessed: 13 March 2023).

APPENDIX 15.1
Record of Monuments and Places (RMP) Sites in the Study Area

APPENDIX 15.2
Architectural Heritage Assessment Report

APPENDIX 15.3
Figures and Photographic Plates

APPENDIX 15.4
Sites in the Sites and Monuments Record in the Study Area

APPENDIX 15.5
Correspondence regarding the Minor Place Names

MO030-035---- TULLYLOUGHERNY Ringfort – rath

Situated in a fold on the S-facing slope of a WNW-ESE spur. This enclosure is depicted on McCrea's map of Co. Monaghan (1793). It is a circular grass-covered area (diam. 54m N-S; 54m E-W), the S half of which slopes down to the S (H 2.4m). It is defined by an earthen bank (at N: Wth of base 7.2m; int. H 1.8m; ext. H 0.4m; at W: Wth of base 5m; int. H 1.7m; ext. H 0.5m) WSW-N-E and by a scarp (at S: Wth 2.3m; H 2m) incorporated into an E-W field bank at S. It is cut by a NNW-SSE farm lane towards the perimeter at E. There is no visible fosse, or identifiable original entrance.

MO030-036---- DRUMGOOSAT Ringfort – rath

Situated at the crest of the N end of a NW-SE drumlin ridge, it is known locally as 'the priest's fort' as it was owned by the parish priest at one time. It is a circular grass-covered area (diam. 49m N-S) that slopes down slightly to the N and is defined by a slight, intermittently visible earthen bank (at SE: Wth of base 4.4m; Wth of top 1.2m; int. H 0.4m; ext. H 0.65m) that is largely reduced to a scarp (at NW: H 2.05m). There is no visible fosse or identifiable original entrance.

MO031-070---- CORRYBRACKAN Ringfort – rath

Located at the S tip of a broad NW-SE spur in a fairly low-lying landscape. It is depicted as an embanked enclosure (ext. diam. c. 45m) described as a 'fort' in gothic lettering on the 1834 edition of the OS 6-inch map, and as a curved field bank NE-SW on the 1907 edition. A field bank (Wth 1.5m; H 1m) and hedge NE-E-SW (Chord c. 50m NE-SW) may incorporate part of the bank but there is no other evidence of an antiquity.

MO031-073---- LOSSET Redundant record

Located on a gentle N-facing slope. This is depicted as an oval scrub-covered area (dims c. 70m NW-SE; c. 30m NE-SW) only on the 1914 edition of the OS 6-inch map. It was mistakenly classified as an earthwork site but there is no reason to believe there is an antiquity here.

MO031-088---- KNOCKNACRAN EAST Ringfort – rath

Located on the gentle E-facing slope of a low hill. This is an overgrown circular area (diam. 38.8m WNW-ESE; 34.5m N-S) that slopes down to the SE (H c. 1m), which is defined by an earthen bank (Wth 5.2-5.4m; int. H 0.4-0.5m; ext. H 1.6-2m) and an outer fosse (Wth of top 6-6.7m; Wth of base 1.2m at WNW to 3.2m at ESE; ext. D 0.2-0.4m). There is an entrance (Wth of base 2.4m) at SE.

MO031-108---- KNOCKNACRAN EAST Barrow - unclassified

Located on a NE-facing slope. It is depicted as a small circular enclosure (diam. c. 5m) on the 1834 edition of the OS 6-inch map where it is described in italic lettering as a 'mound'. It is depicted similarly on the 1907 edition of the map. The feature has been quarried away. According to Shirley (1879, 536) the mound at Knocknacran East was opened in 1860 but nothing was found. It has been quarried away.MO031-108---- Knocknacran East Barrow Sites and Monuments Record (SMR)

MO033-004---- BALLYCARTLAN Ringfort – rath

Situated on a rise which is towards the SE end of a relatively low NW-SE ridge. It is depicted on McCrea's map of Co. Monaghan (1793). This is a circular, domed (H 0.7-1.3m) and grass-covered area (diam. 50m N-S; 47m E-W) defined by an overgrown earthen bank (at N: Wth 5m; int. H 0.6m; ext. H 2m) W-NNE that is largely reduced to an overgrown scarp (at S: Wth 3.4m; H 2.3m) or incorporated into a field bank elsewhere. There is no visible fosse. There are gaps in the perimeter at W, NNE, and SSW, but the last may be the original entrance.

MO033-005001- CAMAGHY Church

Situated on a slight rise. The parish church of Magheracloone, dedicated to St Molua, is listed as de Cluayn in the ecclesiastical taxation (1302-06) of Pope Nicholas IV (Shirley 1879, 289). St Molua of Kyle, Co. Laois (LA015-023001-) is a sixth century saint descended from the Coirce Oiche of Ulster. A twelfth century life connects him in passing with Drumsnat (MO0013-002003-) but his feast day was celebrated on 4 August at Magheracloone. The names of some of the clergy are known from 1443, and at the Suppression of the monasteries in1540 the tithes were impropriate to the Crutched Friars of St John the Baptist's of Ardee (LH017-101022-) but by 1622 they were held the Moore family of Mellifont (Shirley 1879, 372). In that year the church was described as repaired outside (Leslie 1929, 221-2). The church was rebuilt in 1824 on the site of the old one, which was described as being 'very ancient, small and sunk nearly three feet below the level of the ground'. Lewis places the rebuilding date in 1835. The graveslab of John Dobbs dated 1679 (Maffett 1891) is preserved under a fitted carpet in its aisle. The church is in the SE quadrant of a subrectangular or D-shaped graveyard (dims c. 75m NW-SE; c. 60m NE-SW) defined by masonry walls with the straightest wall at NW.

There is a headstone shaped like a Latin cross (H 0.7m; span 0.74m) with a rectangular cross-section (dims 0.4m x 0.22m) commemorating Owen MacMahon and his wife Rose Kelly with the date 1687 close to the church door, and a second headstone shaped like a Latin cross (H 0.83m; span 0.47m) with a narrower stem (dims 0.28m x 0.14m) commemorating Thomas MacNamorue with the date 1685 is in the graveyard. A third headstone of the same form (H 0.85m; span 0.45m) commemorating Patrick Mahen has been recorded with the date 1688 (Shirley 1879, 374), but the date is now illegible.

MO033-005002- CAMAGHY Graveyard

Situated on a slight rise. The site of the parish church of Magheracloone (MO033-005001-) is on the same location as the present Church of Ireland church of St Molua in the SE quadrant of a D-shaped graveyard (dims c. 75m NW-SE; c. 60m NE-SW) defined by masonry walls with the straightest wall at NW. In the graveyard are three headstones shaped like Latin crosses, which commemorate Owen MacMahon (1687), Thomas MacNamorue (1685) and Patrick Mahen (1688).

MO033-005003- CAMAGHY Headstone

Situated within the graveyard at the site of the medieval parish church of Magheracloone (MO033-005001-). There is a headstone shaped like a Latin cross (H 0.7m; span 0.74m) with a rectangular

cross-section (dims 0.4m x 0.22m) commemorating Owen MacMahon and his wife Rose Kelly with the date 1687 close to the church door. The legend is inscribed in roman capitals and reads: 'IHS / THIS CROS WA/S MADE FOR O/WEN MACMAHON AND / HIS WIFE ROSE REILY / IN JULY 1687 AND HE/RE LIETH HIS FATHER / LOUGHLIN MAC EDMON/D MA PHELIM/Y.'

MO033-005004- CAMAGHY Headstone

Within the graveyard at the site of the medieval parish church of Magheracloone (MO033-005001-). There is a headstone shaped like a Latin cross (H 0.83m; span 0.47m) with a narrow stem (dims 0.28m x 0.14m) commemorating Thomas MacNamorue with the date 1685 in the graveyard. The legend is inscribed in roman capitals and reads: 'IHS / THOMAS MAKNAMORUE / ADGED 25 YEARES DYED / THE 8TH OF JANVRY / ANO. DNI. 1685'. The headstone has a cross in a circle (diam. 0.14m) at the crux on the other side.

MO033-005005- CAMAGHY Headstone

Within the graveyard at the site of the medieval parish church of Magheracloone (MO033-005001-). There is a headstone shaped like a Latin cross (H 0.85m; span 0.45m) with a narrow stem (dims 0.22m x 0.15m) commemorating Patrick Mahen, which has been recorded with the date 1688, but the date is now illegible. The legend is inscribed in roman capitals and reads: 'IHS / PRAY FOR THE SOVL OF PATRICK / MAHEN MCARD MC BRE / MC LAVD W / HO DE / PART / ED THIS / LIFE IN / THE YEAR 1688 / …OF HIS AGE / HIS BRO.' The inscription runs onto the N side of the stem 'ART / WHO / .. / THIS / CROSL / .. / HIS BRO /'.

MO033-005006- CAMAGHY Graveslab

The graveslab of John Dobbs who died in 1679 is preserved under a fitted carpet in the aisle of the present Church of Ireland church of St. Molua. The inscription has been recorded (Shirley 1879, 373; Maffett 1891) as: HERE LYETH THE BODY OF / JOHN DOBBS WHO DEPARTED / THIS LIFE MAY THE 17th 1679. / MORTVVS. / LOCKT VP IN HOPEFULL SILEN / CE HERE I LYE, WHAT ONCE I / WAS OTHERS MAY TELL, NOT I. / TVMVLVS. / WHO ERE THOV ART HERE I / PROTECT THE DVST, / OF ONE WAS KNOWING, KIND, / GENTLE, AND JVST; / THE HEART THAT GRVDGES / THIS TO HIM THATS GONE, / IS HARDER MVCH THAN MINE / THO THAT IS STONE.

MO033-006---- DRUMMOND Enclosure

Situated on the SW-facing slope of a low NW-SE drumlin ridge. It is depicted as a small circular embanked enclosure on the 1834 edition of the OS 6-inch map where it is described as a 'fort' with field banks approaching it from NE, SE and NW. This is a circular grass-covered area (diam. 11m; 10.5m N-S;) defined by a scrub-covered earthen bank (Wth of base 2.8-3m; int. H 0.3-0.6m; ext. H 0.7m at N to 1.1m at S) with an outer fosse (at N: Wth of base 3m; ext. D 0.2m) NNW-NE that has been incorporated into a recent drain (at S: Wth of top 3m; Wth of base 1.8m; ext. D 0.6m) elsewhere . There is a large tree-stump at the centre, and there are gaps in the bank at N, E, SE and SSW, none of which need be original. The equally small enclosure (MO033-007----) is c. 100m to the ENE while the cropmark enclosure (MO033-008----) is c. 50m to the ESE.

MO033-007---- DRUMMOND Enclosure

Situated on the summit of a NW-SE drumlin ridge towards the NW end. It is depicted as a small circular embanked enclosure on the 1834 edition of the OS 6-inch map where it is described as a 'fort' with field banks approaching it from NE, NW and SW. This is a circular grass-covered area (diam. 12m) defined by an earthen bank (at NE: Wth at base 4.6m; int. H 0.4ml; ext. H 1.5m) with some scrub, but material has been added to the perimeter S-NNW. There is no visible fosse or entrance. The equally small enclosure (MO033-006----) is c. 100m to the WSW while the cropmark enclosure (MO033-008----) is c. 40m to the SW.

MO033-008---- DRUMMOND Enclosure

Located on the SW-facing slope of a NW-SE drumlin ridge. A circular enclosure (int. diam. c. 35m) defined by a single fosse feature (Wth c. 5m) that has a large opening (Wth c. 10m) at SE is visible on aerial photographs (CUCAP: AVG 85, 86) dating from c. 1973. It is also visible on Google Images (19/03/2015). The small enclosures (MO033-007----) and (MO033-008----) are c. 50m to the WNW and c. 40m to the NE respectively.

MO034-001---- DERRYNASCOBE Ringfort – rath

Located at the S tip of a N-S drumlin ridge, with large quarry works c. 40m to the NW. This is a circular area (diam. 33.4m N-S; int. diam. 27m N-S), which was grass-covered with N-S cultivation ridges in 1967 but is now scrub-covered, defined by an overgrown earthen bank (Wth 5-6.2m; int. H 0.2m at S to 1.3m at N; ext. H 2-2.4m) separated by a water-logged fosse (Wth of top 6-6.6m; Wth of base 2-2.4m; ext. D 1.4-1.9m) SE-W-NNE from an outer bank (Wth 1.6-3.2m; ext. H 0.4m) SE-W and NW-NNE, which is probably a field bank. The original entrance is not identified.

MO034-003---- CLONSEDY Ringfort – rath

Situated on the spine of and on the SE-facing slope of a NW-SE spur. This is a circular grass-covered area (diam. 43m NNE-SSW; 40m WNW-ESE) with relict cultivation ridges defined by a an overgrown earthen bank (at WNW: Wth of base 6m; Wth of top 1m; int. H 0.5m; ext. H 1.5m) with traces of an outer stone-facing separated by a rounded fosse (at WNW: Wth of top 5.8m; ext. D 1.6m) from a slight outer bank (at WNW: Wth 5m; ext. H 0.3m). These features only survive SSW-NW, but the inner bank is evident by a slight scarp elsewhere (at ESE: Wth c. 10m; H 0.8m). Gaps in the inner bank at NW (Wth 1.7m) and NNW (1.5m) are probably modern.

MO034-003---- CLONTRAIN Ringfort – rath

Located on a slight rise. This is a circular grass and rush covered area (int. diam. 33m ENE-WSW) defined by an earthen bank (Wth 4.6-6m; int. H 0.4-0.6m; ext. H 0.8m at NE to 1.9m at SW), with a fosse surviving E-SSE that widens into a pool S-SW, which may be modern. There is an entrance (Wth 2.5m) and causeway (Wth of top 3m), probably modern, at SW, but a gap (Wth 2.5m) at N is more likely to be original. The perimeter is incorporated into a field bank N-E. Farm sheds abutted the bank

at SE in 1967 but a shed was built on the perimeter at S before 1995, and the interior is now scrub-covered.

Proposed development consisting of (1) excavation of the former (Drumgoosat) underground mine by open cast mining methods for the purposes of gypsum extraction at Knocknacran (East & West) and Drumgoosat, Co. Monaghan.

Architectural Heritage Impact Assessment Report

For

Saint-Gobain Mining (Ireland) Ltd.

Author

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Introduction

This Architectural Heritage Impact Assessment Report (AHIAR) was prepared by Dr. Charles Mount for Saint-Gobain Mining (Ireland) Ltd. as a study in support of a planning application and EIAR. It represents the results of a heritage assessment of the proposed development on four structures. The application site is in the townlands of Drumgoosat, and Knocknacran East and West, c.4km southwest of the town of Carrickmacross and directly northwest of the R179 road.

The Development Proposal

The proposed development will include the construction of a Cut-and-Cover Tunnel under the Carrickmacross to Kingscourt regional road (R179) for the transport of gypsum (by haulage truck and covered conveyor) to the existing processing plant area at Knocknacran, and for the transport of overburden and interburden (by haulage truck) to the existing Knocknacran Open-Cast Mine site for ongoing restoration purposes. The construction of the proposed tunnel will necessitate a temporary realignment of the R179 during the tunnel construction period to allow the R179 to remain in constant use. Development will also include: the demolition of one house and three unoccupied houses and sheds in the townlands of Knocknacran (East & West), Co. Monaghan; and the pumping of water from the existing Drumgoosat underground workings via an existing borehole on the Knocknacran West Mine site. (2) The continued ongoing restoration of the existing Knocknacran Open-Cast Mine located in the townlands of Derrynascobe, Derrynaglah, Enagh, Knocknacran (East & West) and Drummond, Co. Monaghan, permitted under Reg. Ref. 17/217 and operating subject to Industrial Emissions (IE) Licence P0519-04 and Mining Lease M139. The proposed development includes a modification to the existing (approved) restoration plan to return the existing Knocknacran Open-Cast Mine to near ground levels. (3) The continuation of use and refurbishment of the existing Knocknacran Processing Plant area, including water treatment facilities and associated infrastructure (including discharge pipeline to the River Bursk) in the townlands of Enagh, Derrynaglah, Drummond, Derrynascobe and Clontrain, Co. Monaghan. The proposed development will include a replacement vehicular access to the existing Knocknacran Open-Cast Mine and Knocknacran Processing Plant area site from the L4816. (4) The further development of a Community Sports Complex (permitted under Reg. Ref. 20/365) located in the townlands of Drummond, Derrynaglah and Knocknacran West, Co. Monaghan which provided for a playing pitch, dressing rooms, welfare facilities, parking and associated drainage/wastewater infrastructure.

The County Development Plan

The Monaghan County Development Plan 2019-2025 (CDP) is the statutory plan detailing the development objectives/policies of the local authority. The plan includes objectives and policies, relevant to this assessment, i.e., regarding cultural heritage. Chapter 6 of the Development Plan sets out the policies on architectural heritage within the county. The plan states that:

> *The Planning and Development Act 2000 (as amended) requires planning authorities to include in their development plans, policies and objectives for the protection, enhancement and preservation of the built heritage in their functional area. The principal means of doing this is by maintaining a Record of Protected Structures (RPS); this record identifies buildings of special architectural, historical, artistic, cultural, scientific, social or technical interest.*

The plan notes that:

There are also structures of distinctive traditional styles throughout County Monaghan and whilst these may not be included in the record of protected structures, they reflect the unique local history and character of place. Vernacular structures are extremely vulnerable due to the changing needs and demands of the modern generation. The re-use and adaption of existing buildings is preferable to their demolition. The Government Policy on Architecture (2009-2015) seeks that all public authorities address the reuse of existing building stock, regardless of its protected status or otherwise.

The plan includes policies in relation to Protected Structures (see below).

BHP 1 To protect and conserve all structures included in the Record of Protected Structures and to encourage the sympathetic re-use and long-term viability of such structures without detracting from their special interest and character.

BHP 2 To contribute, as appropriate, towards the protection and sympathetic enhancement of archaeological heritage, in particular by implementing the relevant provisions of the Planning and Development Act 2000 (as amended) and the National Monuments Act, 1930 (as amended).

BHP 3 To contribute towards the protection of architectural heritage by complying, as appropriate, with the legislative provisions of the Planning and Development Act 2000 (as amended) in relation to architectural heritage and the policy guidance contained in the Architectural Heritage Protection Guidelines 2011 (and any updated/superseding document).

BHP 4 To maintain and update the Record of Protected Structures in consultation with the National Inventory of Architectural Heritage and to encourage the sympathetic conservation, renewal and repair of these structures.

BHP 5 Planning permission for the demolition of any protected structure shall not be granted except in exceptional circumstances and in accordance with Section 57(10)(b) of the Planning and Development Act 2000.

BHP 6 To ensure that any new development proposed to or in the vicinity of a Protected Structure will complement and be sympathetic to the structure and its setting in terms of its design, scale, height massing and use of materials and to resist any development which is likely to impact on the building's special interest and/ or any views of such buildings and their setting.

BHP 7 To facilitate the retention and sympathetic re-use of protected structures and their settings in circumstances where the proposal is compatible with their character and special interest. In certain instances, land use zoning restrictions and site development standards may be relaxed to secure the conservation and reuse of a protected structure and to provide a viable use for any building which is at risk by virtue of being derelict or vacant.

BHP 8 To require that proposals for works to a protected structure shall be carried out in accordance with best practice as advocated in the Architectural Heritage Protection Guidelines 2011(and any subsequent guidelines).

BHP 9 To use the provisions of the Planning and Development Act 2000 and the Derelict Sites legislation to prevent the loss or deterioration of the County's Architectural Heritage.

BHP 10 The Council aims to conserve the built fabric of the Ulster Canal, Great Northern Railway, historic mills and other industrial heritage structures throughout the county and planning permission will be required for their removal or alteration.

The plan includes policies in relation to Architectural Conservation Areas (see below).
CP 1 To prepare character appraisals for each of the designated Architectural Conservation Areas in the County to guide new development proposals and environmental improvements by identifying the character of each ACA and designing objectives to ensure that their distinctiveness and special interest are preserved and enhanced.

ACP 2 To resist development that would adversely affect the character and appearance of the Architectural Conservation Area. New development or alterations to existing building(s) in an ACA shall reflect the historic architecture in terms of scale, design and materials used. Regard shall be had to any objectives contained in the character appraisals (where applicable).

Methodology

This AHIAR which has been prepared in accordance with the Architectural Heritage Protection Guidelines for Planning Authorities 2011, Appendix B (Architectural Heritage Impact Assessments) and is a written and illustrated account setting out the core data, short description and analysis of the four structures proposed for demolition with an impact assessment and recommendations and conclusions.

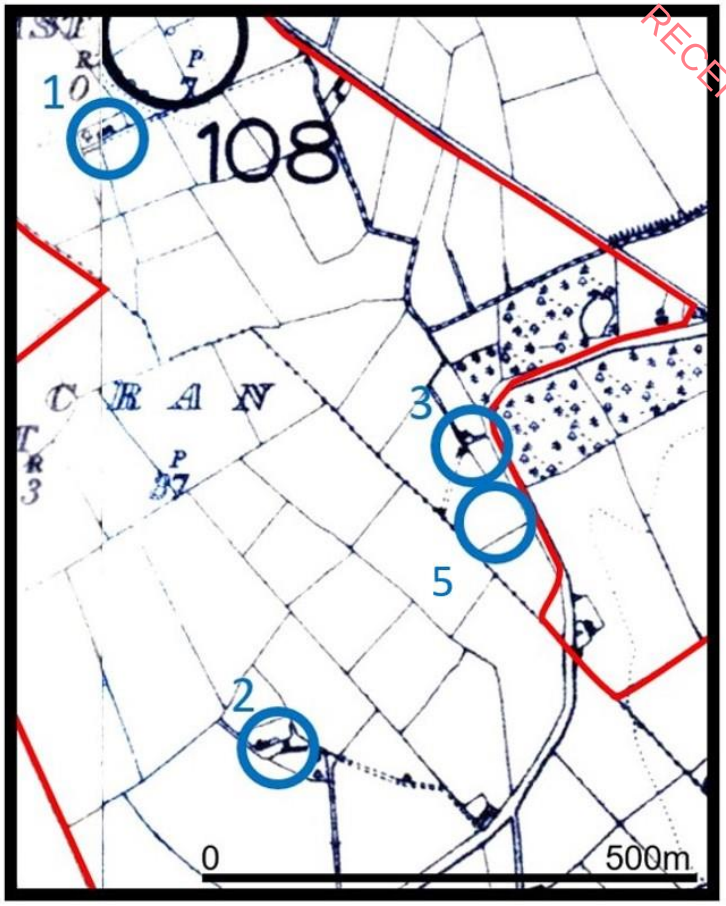

Fig 1. RMP map for Co. Monaghan indicating the Locations of the four structures 1, 2, 3 and 6 structures propose for demolition with blue circles.

Structure 1

Core Data

Purpose of the assessment
This Architectural Heritage Impact Assessment Report (AHIAR) was prepared for Saint-Gobain Mining (Ireland) Ltd. in relation to a proposed development at Knocknacran (East & West) and Drumgoosat, Co. Monaghan.

Name and address of the structure
Unnamed farmhouse, Knocknacran East, Carrickmacross, Co. Monaghan, without Eircode.

Plate 1: View of structure 1 looking north.

Brief description
Farmhouse, built between 1836 and 1897, with outbuilding.

Ordnance Survey grid reference
ITM 680443/800603

Details of the form, or forms, of statutory protection which apply to the site
i. Record of Protected Structures
The structure is not listed in the Co. Monaghan Record of Protected Structures.

ii. Architectural Conservation Area designation
The structure is not located in a designated Architectural Conservation Area.

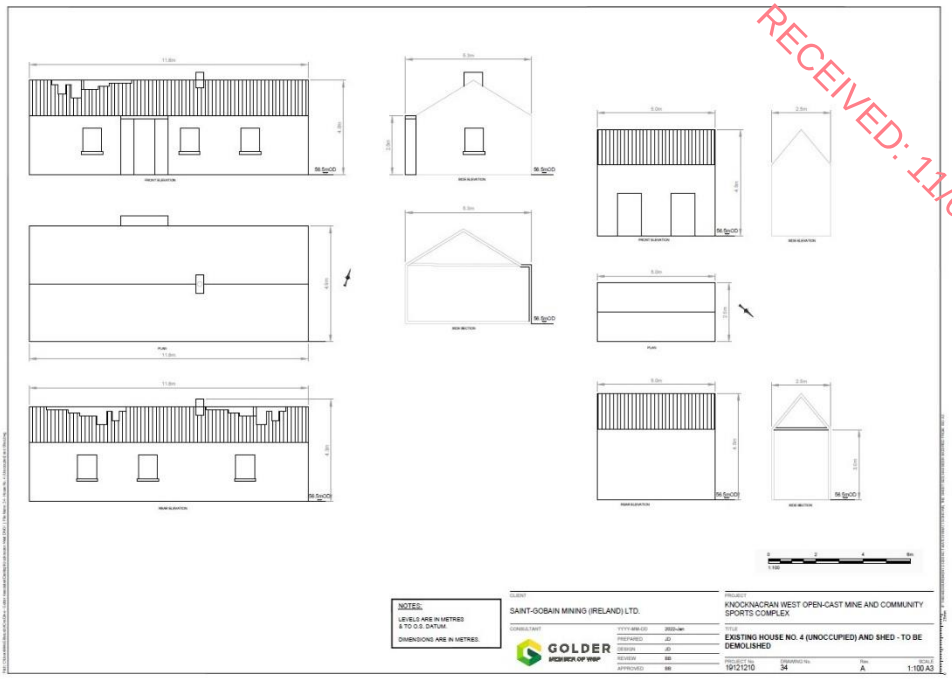

Fig 2: Plan of structure 1.

Report author
The assessment was prepared by Dr. Charles Mount who is a member of the Institute of Archaeologists of Ireland and has more than thirty years of cultural heritage assessment experience. He holds M.A. and Ph.D. degrees in archaeology as well as a professional diploma in EIA and SEA Management.

Date of assessment/inspection
The structure was inspected by the author on the 16th of August 2022.

Planning Authority
Monaghan County Council

Details of any declaration issued regarding the structure
There are no known declarations concerning the site.

National Inventory of Architectural Heritage number
The structure is not included in the National Inventory of Architectural Heritage.

Description of the structure

Abandoned and partly ruined farmhouse, built between 1836 and 1897, comprising house and outbuilding. One-storey four-bay house, with flat-roofed porch to front (south). Pitched fibre-cement asbestos roof (partly ruined, is allowing ingress of rain), with brick chimneystack. Rubble stone walls with rough-cast render. Square-headed window openings have decaying timber-frames. Square-headed doorway with no door. Interior in poor condition, ceilings decaying, original fittings and furnishings removed and building used to store hay.

Detached two-bay single-storey outbuilding to east having pitched partly ruined corrugated-iron roof, rubble stone walls, and square-headed doorways with no surviving render.

Analysis of the structure

The structure was originally built between 1836 and 1897as a farmhouse and has been abandoned.

Current physical condition

The structure is deteriorating (Plates 1-4). The roofs is failing and allowing ingress of water that is leading to the collapsed of the ceilings. Most of the internal fittings and furnishings have been removed and the entrance is missing its door.

Relationship of the structure to its setting

Structure 1 is set on the edge of a field and has no garden.

Persons or organisations associated with the construction

The are no known persons associated with the construction and use of the structure.

Plate 2. View of structure 1 interior, entrance.

Plate 3. View of structure 1 interior, west room.

Plate 4. View of View of structure 1 interior, east room.

Plate 5. View of structure 1 outbuilding looking east.

Impact Assessment

Assessment of the special interest of the structure in accordance with the Architectural Heritage Protection Guidelines 2011, including contribution to special interest made by the setting

The Architectural Heritage Protection Guidelines 2011 (2.5.7) set out the characteristics of architectural interest that may be attributed to a structure and includes (2.5.7 d) a structure which make a positive contribution to its setting. The significance of the architectural special interest is assessed below with reference to five criteria: structure rarity, ensemble value, fittings and furnishings, condition and use value and is summarised in Table 1.

Rarity value
The structure is one of many later nineteenth century farmhouses in the region and 1 is considered to have low rarity value.

Ensemble
The structure has one outbuilding. The structure is set away from the main road, is not visible from the main road and makes no contribution to the streetscape.

Fittings and furnishings
The structure survives as an abandoned ruin that has lost most of the original elements that contribute to any special interest.

Condition
The structure is ruined reducing its condition value and compromising its survival as an upstanding structure.

Use
The structure has fallen into a ruined condition and could not be re-used and adapted without extensive conservation works thereby reducing its use value.

Value	Significance
Rarity	Low
Ensemble	Low
Fittings and furnishings	Low
Condition	Low
Use	Low

Table 1. Summary of assessment of architectural special interest of structure 1.

Conclusion

The architectural special interest of structure 1 is generally low. As noted in the core data set out above the potential contribution that structure 1 makes to its setting is considerably reduced by its abandoned and ruined condition and the fact that it is not visible from the local road.

Assessment of the impact of the proposed development on the setting and special interest of the structure

The proposed development will have a permanent negative impact on structure. However, as the architectural special interest of structure 1 is generally low the impact will not be significant.

Recommendations

This assessment has found that the architectural special interest of structure 1 is generally low achieving only a low significance. The proposed development will have a permanent negative impact on structure. However, as the architectural special interest of structure 1 is generally low the impact will not be significant. This impact can be successfully mitigated through preservation by record.

Structure 2

Core Data

Purpose of the assessment
This Architectural Heritage Impact Assessment Report (AHIAR) was prepared for Saint-Gobain Mining (Ireland) Ltd. at Knocknacran (East & West) and Drumgoosat, Co. Monaghan.

Name and address of the structure
Unnamed farmhouse, Knocknacran West, Carrickmacross, Co. Monaghan, without Eircode.

Plate 6: View of structure 2 looking north.

Brief description
Farmhouse, built before c.1836, with outbuildings.

Ordnance Survey grid reference
ITM 680626/799980.

Details of the form, or forms, of statutory protection which apply to the site
i. Record of Protected Structures
The structure is not listed in the Co. Monaghan Record of Protected Structures.

ii. Architectural Conservation Area designation
The structure is not located in a designated Architectural Conservation Area.

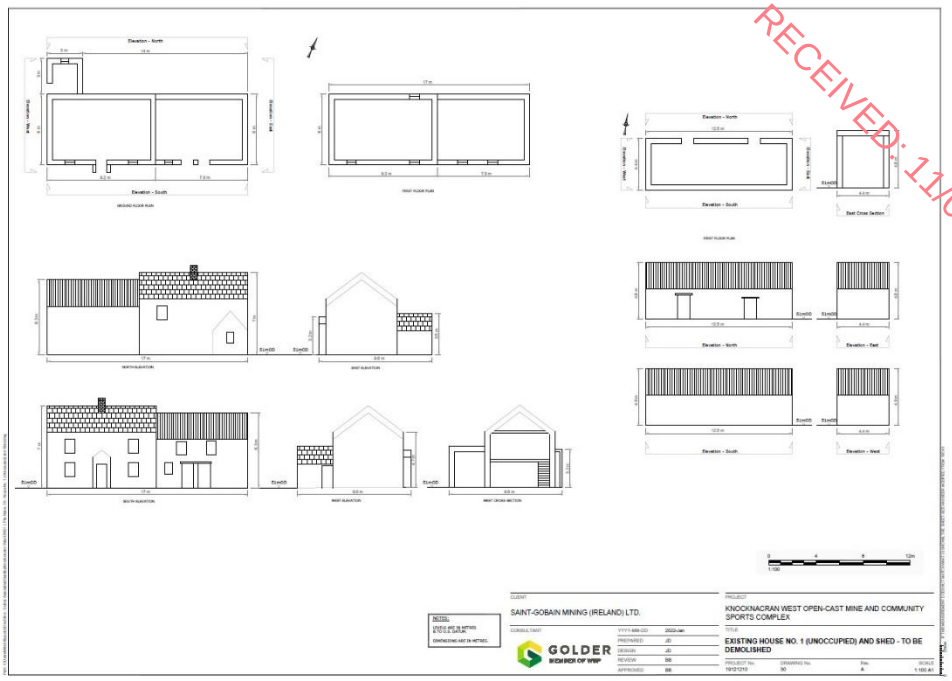

Fig 2: Plan of structure 2.

Report author
The assessment was prepared by Dr. Charles Mount who is a member of the Institute of Archaeologists of Ireland and has more than thirty years of cultural heritage assessment experience. He holds M.A. and Ph.D. degrees in archaeology as well as a professional diploma in EIA and SEA Management.

Date of assessment/inspection
The structure was inspected by the author on the 16th of August 2022.

Planning Authority
Monaghan County Council

Details of any declaration issued regarding the structure
There are no known declarations concerning the site.

National Inventory of Architectural Heritage number
The structure is not included in the National Inventory of Architectural Heritage.

Description of the structure

Abandoned and ruined farmhouse, built before c.1836, comprising house and outbuildings. Two-storey house having three-bay ground floor and two-bay first floor, with gabled porch to front (south). Pitched tiled roof, with brick chimneystack. Rubble stone walls with little surviving render. Square-headed window openings have mostly ruined timber-frames. Square-headed doorway with no door (Plate 6).

Ruined Two-bay two-storey outbuilding attached to east gable, having pitched mostly ruined corrugated-iron roof, rubble stone walls, square-headed openings with mostly ruined timber-frames. Square-headed doorway with no doors.

Ruined detached two-bay single-storey outbuilding to east having pitched collapsed corrugated-iron roof, rubble stone walls, and square-headed openings.

Analysis of the structure

The structure originally built before c.1836 as a farmhouse has been abandoned.

Current physical condition

The structure is a deteriorating ruin (Plates 7-10). Much of the external render and the internal plaster has been eroded exposing the rubble stonework to weathering which is washing out the mortar. Most of the internal fittings and furnishings have been removed. The stair is partly collapsed making access to the upper story impossible and the upper floor is deteriorating. The entrance is missing its door. The ground floor interior is exposed to the elements.

The roof has been removed from most of the attached outbuilding at east exposing the walls and the interior to rain and damp and the interior is becoming overgrown (Plate 11).

The detached outbuilding to the east is overgrown, the roof and the upper walls are collapsing (Plate 12).

Plate 7. View of structure 2 interior, downstairs kitchen.

Plate 8. View of structure 2 interior, downstairs east room.

Plate 9. View of structure 2 interior, stairwell.

Plate 10. View of structure 2 interior, upstairs west room, taken from downstairs through open floor.

Plate 11. View of structure 2 outbuilding looking north.

Plate 12. View of structure 2 outbuilding looking south.

Relationship of the structure to its setting
Structure 2 is set within a small rectangular grassed yard.

Persons or organisations associated with the construction
The are no known persons associated with the construction and use of the structure.

Impact Assessment

Assessment of the special interest of the structure in accordance with the Architectural Heritage Protection Guidelines 2011, including contribution to special interest made by the setting

The Architectural Heritage Protection Guidelines 2011 (2.5.7) set out the characteristics of architectural interest that may be attributed to a structure and includes (2.5.7 d) a structure which make a positive contribution to its setting. The significance of the architectural special interest is assessed below with reference to five criteria: structure rarity, ensemble value, fittings and furnishings, condition and use value and summarised in Table 2.

Rarity value
The structure is one of many pre-1836 farmhouse in the region and is considered to have low rarity value.

Ensemble
The structure is associated with a small rectangular grassed area and two outbuildings. The structure is set away from the main road, but is visible from the main road in the distance at south making a minor contribution to the streetscape.

Fittings and furnishings
The structure survives as an abandoned shell that has lost, most of its window frames, most of its render, internal fittings and furnishings and other original elements that contribute to any special interest.

Condition
The structure has fallen into a partly ruined condition reducing its condition value and compromising its survival as an upstanding structure. The outbuilding to east has lost part of its roof and is in a worse condition.

Use
The structure has fallen into a partly ruined condition and could not be re-used and adapted without extensive conservation works. Structures 2 is also located just to the south-west of an area of land subsidence. The structure is located above an area of underlying mine workings and there is a general subsidence risk associated with the land on this site. Due to health and safety concerns, it is unlikely the structure could be re-used and adapted.

Value	**Significance**
Rarity	Low
Ensemble	Low
Fittings and furnishings	Low
Condition	Low
Use	Low

Table 2. Summary of assessment of architectural special interest of structure 2.

Conclusion
The architectural special interest of structure 2 is generally low. Due to the structures siting over mine workings and its proximity to land subsidence it is unlikely the structure could be re-used and adapted.

Assessment of the impact of the proposed development on the setting and special interest of the structure

The proposed development will have a permanent negative impact on structure. However, as the architectural special interest of structure 2 is generally low the impact will not be significant.

Recommendations

This assessment has found that the architectural special interest of structure 2 is generally low. The proposed development will have a permanent negative impact on structure. However, as the architectural special interest of structure 2 is generally low the impact will not be significant and the impact can be successfully mitigated through preservation by record.

Structure 3

Core Data

Purpose of the assessment
This Architectural Heritage Impact Assessment Report (AHIAR) was prepared for Saint-Gobain Mining (Ireland) Ltd. in relation to a proposed development at Knocknacran (East & West) and Drumgoosat, Co. Monaghan.

Name and address of the structure
Unnamed farmhouse, Knocknacran East, Carrickmacross, Co. Monaghan, without Eircode.

Plate 13: View of structure 3 looking north.

Brief description
Farmhouse, built before c.1836, with outbuildings.

Ordnance Survey grid reference
ITM 680815/800296.

Details of the form, or forms, of statutory protection which apply to the site
i. Record of Protected Structures
The structure is not listed in the Co. Monaghan Record of Protected Structures.

ii. Architectural Conservation Area designation
The structure is not located in a designated Architectural Conservation Area.

Fig 2: Plan of structure 3.

Report author
The assessment was prepared by Dr. Charles Mount who is a member of the Institute of Archaeologists of Ireland and has more than thirty years of cultural heritage assessment experience. He holds M.A. and Ph.D. degrees in archaeology as well as a professional diploma in EIA and SEA Management.

Date of assessment/inspection
The structure was inspected by the author on the 16th of August 2022.

Planning Authority
Monaghan County Council

Details of any declaration issued regarding the structure
There are no known declarations concerning the site.

National Inventory of Architectural Heritage number
The structure is not included in the National Inventory of Architectural Heritage.

Description of the structure

Farmhouse, built before c.1836, comprising house and outbuildings. Two-storey house with two-bay first floor and three-bay ground floor, with gabled porch to east end of front, a single-bay single-storey extension attached to east end gable, and a single-bay single-storey outbuilding attached to west gable. Pitched cement tile roof, with rendered chimneystack. Roughcast rendered rubble stone walls. Square-headed window openings with replacement uPVC windows. Square-headed doorway with replacement door. Single-bay one-storey extension attached to east gable, having pitched corrugated-iron roof, roughcast rendered rubble stone walls, square-headed opening with replacement uPVC window (Plates 13-19).

One-bay single-storey outbuilding to west gable having slanted corrugated iron roof, mostly constructed of concrete blocks with one low whitewashed rubble stone wall at east and large square-doorway at south (Plate 20).

Detached two-bay two-storey outbuilding to south, having pitched corrugated iron roof, whitewashed rubble stone walls, one square-headed opening in each storey of the facade with wooden doors. Square-headed doorway and one square-headed window in each in east face, and square-headed doorway in south face (Plate 21).

Analysis of the structure

The structure originally built before c.1836 as a farmhouse.

Current physical condition

The structure retains its roof, windows and doors and is in fair condition. Part of the interior is being used to store wood and other items.

Plate 14. View of structure 3 interior, downstairs west room.

Plate 15. View of structure 3 interior, downstairs middle room.

Plate 16. View of structure 3 interior, downstairs east room.

Plate 17. View of structure 3 interior, upstairs hall.

Plate 18. View of structure 3 interior, upstairs east room.

Plate 19. View of structure 3 interior, upstairs west room.

Plate 20. View of structure 3 outbuilding looking west.

Plate 21. View of structure 3 outbuilding looking south.

Relationship of the structure to its setting
Structure 3 is set on north side of small yard formed by outbuildings.

Persons or organisations associated with the construction
The are no known persons associated with the construction and use of the structure.

Impact Assessment

Assessment of the special interest of the structure in accordance with the Architectural Heritage Protection Guidelines 2011, including contribution to special interest made by the setting

The Architectural Heritage Protection Guidelines 2011 (2.5.7) set out the characteristics of architectural interest that may be attributed to a structure and includes (2.5.7 d) a structure which make a positive contribution to its setting. The significance of the architectural special interest is assessed below with reference to five criteria: structure rarity, ensemble value, fittings and furnishings, condition and use value and summarised in Table 3.

Rarity value
The structure is one of many pre-1836 farmhouse in the region, and is considered to have low rarity value.

Ensemble
The structure is situated within its own curtilage with several outbuildings. The structure is set away from the main road, is not visible from the main road and makes no contribution to the streetscape.

Fittings and furnishings
The structure does not retain its original windows and doors.

Condition
The structure is in fair condition.

Use
Structures 3 is also located just to the north-east of an area of land subsidence. The structure is located above an area of underlying mine workings and there is a general subsidence risk associated with the land on this site. Due to health and safety concerns it is unlikely the structure could be re-used and adapted.

Value	**Significance**
Rarity	Low
Ensemble	Low
Fittings and furnishings	Moderate
Condition	Moderate
Use	low

Table 3. Summary of assessment of architectural special interest of structure 3.

Conclusion
The architectural special interest of structure 3 is generally low to moderate. As noted in the core data set out above the potential contribution that structure 3 makes to its setting is reduced by the fact that it is not visible from the local road. Due to the structures siting over mine workings and its proximity to land subsidence it is unlikely the structure could be re-used and adapted.

Assessment of the impact of the proposed development on the setting and special interest of the structure

The proposed development will have a permanent negative impact on structure. However, as the architectural special interest of structure 3 is generally low to moderate the impact will not be significant.

Recommendations

This assessment has found that the architectural special interest of structure 3 is generally low to moderate. The proposed development will have a permanent negative impact on structure. However, as the architectural special interest of structure 3 is generally low to moderate the impact will not be significant and can be successfully mitigated through preservation by record.

Structure 5

Core Data

Purpose of the assessment
This Architectural Heritage Impact Assessment Report (AHIAR) was prepared for Saint-Gobain Mining (Ireland) Ltd. in relation to a proposed development at Knocknacran (East & West) and Drumgoosat, Co. Monaghan.

Name and address of the structure
Unnamed bungalow, Knocknacran East, Carrickmacross, Co. Monaghan, Eircode A81 YK65.

Plate 22. View of structure 5 looking west.

Brief description
Bungalow granted planning permission 23/07/1981, Planning application details ref: 81396 Monaghan County Council.

Ordnance Survey grid reference
ITM 680847/800204.

Details of the form, or forms, of statutory protection which apply to the site
i. Record of Protected Structures
The structure is not listed in the Co. Monaghan Record of Protected Structures.

ii. Architectural Conservation Area designation
The structure is not located in a designated Architectural Conservation Area.

Fig 2: Plan of structure 5.

Report author
The assessment was prepared by Dr. Charles Mount who is a member of the Institute of Archaeologists of Ireland and has more than thirty years of cultural heritage assessment experience. He holds M.A. and Ph.D. degrees in archaeology as well as a professional diploma in EIA and SEA Management.

Date of assessment/inspection
The structure was inspected by the author on the 16th of August 2022.

Planning Authority
Monaghan County Council

Details of any declaration issued regarding the structure
There are no known declarations concerning the site.

National Inventory of Architectural Heritage number
The structure is not included in the National Inventory of Architectural Heritage.

Description of the structure

Bungalow, built after 1981, comprising bungalow with attached garage. One-storey four-bay bungalow, with a single-bay single-storey garage attached to north end gable. Pitched wessex-tiled roof, with chimneystack. Concrete walls. Square-headed window openings with uPVC windows. Square-headed doorway with door. With garden (Plate 22).

Analysis of the structure

The structure originally built after 1981 as a bungalow.

Current physical condition
The structure retains its windows and doors and is in good condition.

Relationship of the structure to its setting
Structure 6 is set within its own garden.

Persons or organisations associated with the construction
Constructed by Patrick Rafferty, Knocknacran, Magheraclone, Carrickmacross.

Impact Assessment

Assessment of the special interest of the structure in accordance with the Architectural Heritage Protection Guidelines 2011, including contribution to special interest made by the setting

The Architectural Heritage Protection Guidelines 2011 (2.5.7) set out the characteristics of architectural interest that may be attributed to a structure and includes (2.5.7 d) a structure which make a positive contribution to its setting. The significance of the architectural special interest is assessed below with reference to five criteria: structure rarity, ensemble value, fittings and furnishings, condition and use value and summarised in Table 4.

Rarity value
The structure is a standard 1980s bungalow. Therefore structure 5 is considered to have low rarity value.

Ensemble
The structure is situated on its own within its own curtilage with low ensemble value.

Fittings and furnishings
The structure retains its fittings and furnishings but these are mass-produced and are not considered to be of architectural interest

Condition
The structure is in good condition.

Use
The structure retains its windows and doors and and could be re-used and adapted with some works.

Value	Significance
Rarity	Low
Ensemble	Low
Fittings and furnishings	Low
Condition	Low
Use	Low

Table 4. Summary of assessment of architectural special interest of structure 6.

Conclusion

Structure 5 is a standard 1980s bungalow and has no architectural special interest.

Assessment of the impact of the proposed development on the setting and special interest of the structure

The proposed development will have a permanent negative impact on structure. However, as the structure has no architectural special interest the impact will not be significant.

Recommendations

This assessment has found that structure 6 is a standard 1980s bungalow and has no architectural special interest. The proposed development will have a permanent negative impact on structure. However, as the structure has no architectural special interest the impact will not be significant. As the structure has no architectural special interest no mitigation is required.

Dr. Charles Mount
23 August 2022

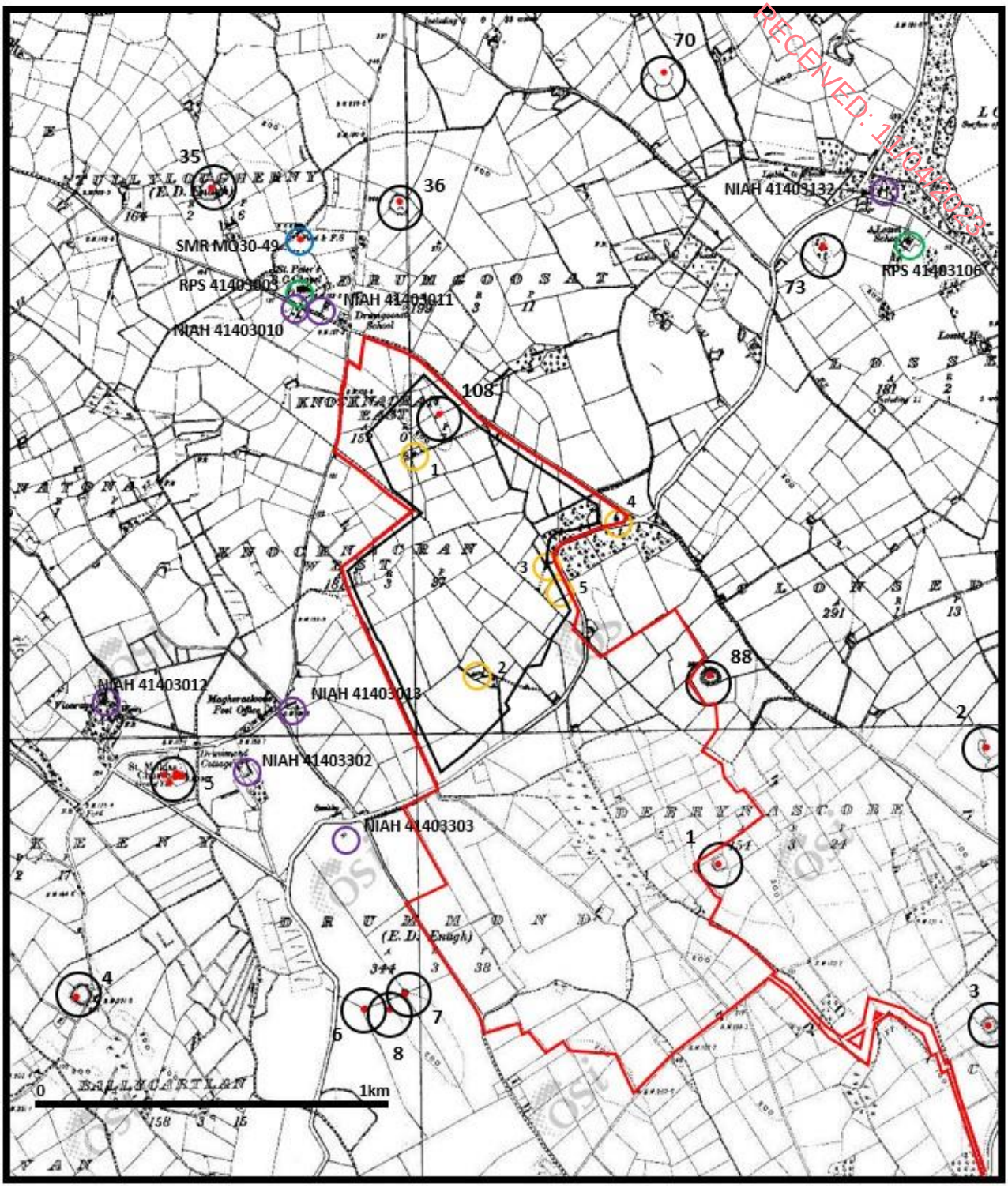

Figure 15.1 **The application area superimposed on the Record of Monuments and Places map for Co. Monaghan. The overall application area is indicated with the red line. The proposed extraction area is indicated with a black line. Recorded Monuments are indicated with black circles. Sites in the SMR with blue circles. Protected Structures are indicated with green circles. Structures in the NIAH are indicated with purple circles. Structures within the application area indicated on the 1907 edition of the six-inch Ordnance Survey map are indicated with gold circles.**

Plate15.1: View of structure 1 looking north

Plate15.2: View of structure 2 looking north

Plate15.3: View of structure 3 looking north

Plate15.4: View of structure 4 looking south-west

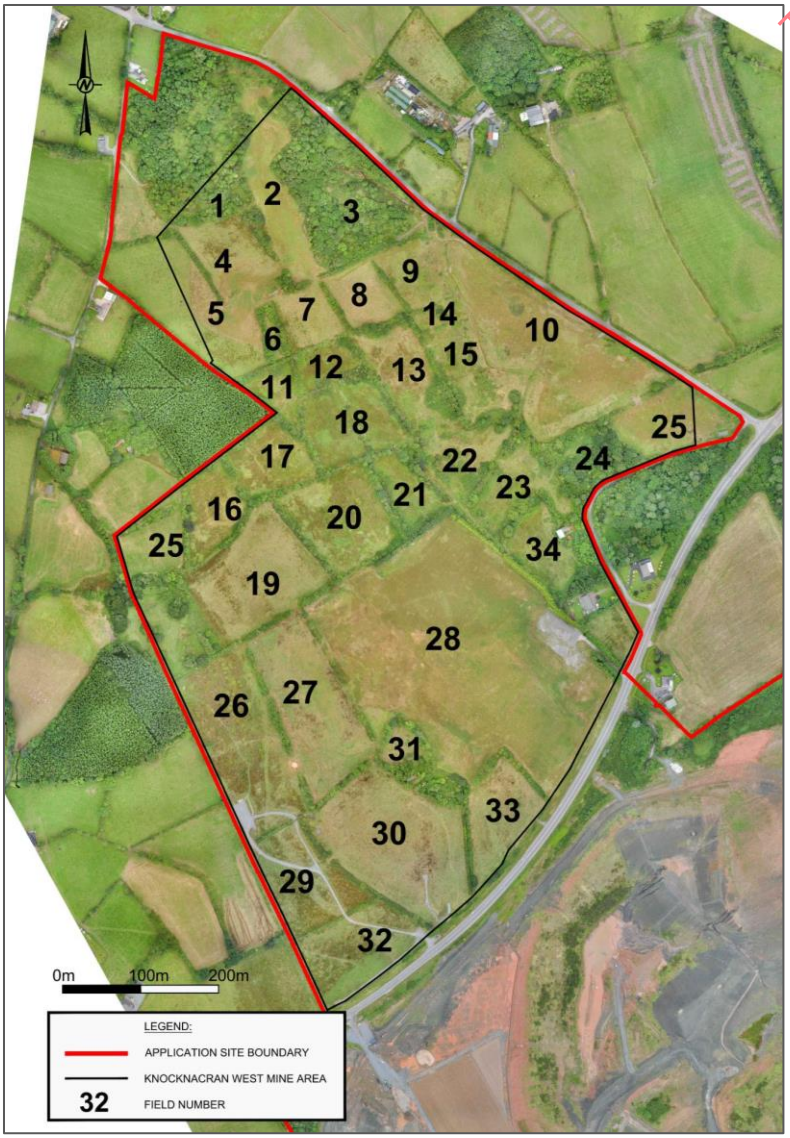

Plate15.5: Aerial image of the new proposed extraction area with the fieldwork areas numbered

Plate15.6: View of Area 1 looking east

Plate15.7: View of Area 2 looking south

Plate15.8: View of Area 3 looking east

Plate15.9: Panoramic view of Area 4 looking north-west

Plate15.10: Panoramic view of Area 5 looking north

Plate15.11: View of Area 6 looking south

Plate15.12: Panoramic view of Area 7 looking south-west

Plate15.13: Panoramic view of Area 8 looking south-west

Plate15.14: Panoramic view of Area 9 looking east

Plate15.15: View of Area 10 looking south-east

Plate15.16: View of Area 11 looking south-west

Plate15.17: Panoramic view of Area 12 looking south-east

Plate15.18: Panoramic view of Area 13 looking north

Plate15.19: View of Area 14 looking west

Plate15.20: View of Area 15 looking north

Plate15.21: Panoramic view of Area 16 looking south

Plate15.22: Panoramic view of Area 17 looking east

Plate15.23: Panoramic view of Area 18 looking south-east

Plate15.24: Panoramic view of Area 19 looking west

Plate15.25: Panoramic view of Area 20 looking south

Plate15.26: View of Area 21 looking south

Plate15.27: Panoramic view of Area 22 looking north

Plate15.28: Panoramic view of Area 23 looking west

Plate15.29: View of Area 24 looking east

Plate15.30: Panoramic view of Area 25 looking south

Plate15.31: Panoramic view of Area 26 looking north

Plate15.32: Panoramic view of Area 27 looking south

Plate15.33: Panoramic view of Area 29 looking north-west

Plate15.34: Panoramic view of Area 30 looking north

Plate15.35: Panoramic view of Area 31 looking north

Plate15.36: Panoramic view of Area 32 looking south-west

Plate15.37: Panoramic view of Area 33 looking south

Plate15.38: Panoramic view of Area 34 looking south

Appendix 15.2 Sites and Monuments Records (SMR) in the Study Area

MO030-049----

DRUMGOOSAT

Mass-rock

Situated in pasture on the floor of a small N-S stream c. 25m SE of NE-SW section of the stream. This is a rectangular stone (dims 0.75m x 0.35m; H 0.4m) with two whitethorn trees growing over it. A commemorative Mass was celebrated here c. 1980, and it is well known locally, although not mentioned by the sources.

Hannah McGillycuddy

From: Logainm.ie <logainm@dcu.ie>
Sent: 30 March 2023 13:16
To: Hannah McGillycuddy
Subject: Re: Minor field names - Knocknacran West, Monaghan

Hanna, a chara,

Thank you very much for this and for the work you are doing. I have authorised your submissions on meitheal.logainm and upgraded your account to *senior user* meaning I won't have to check each submission personally henceforth.

I will also forward your email to the Placenames Branch to notify them of the work you are doing.

Beannacht,

Andrea

Foireann logainm.ie
Fiontar & Scoil na Gaeilge | Ollscoil Chathair Bhaile Átha Cliath (DCU)
logainm@dcu.ie | logainm.ie | meitheal logainm.ie | @logainm_ie | Nuachtlitir


Ar Máirt 28 Márta 2023 ag 16:41, scríobh Hannah McGillycuddy <hmcgillycuddy@slrconsulting.com>:

> Good afternoon,
>
> I've recently uploaded several field names onto the Meitheal Logainm website in Knocknacran West, Magheracloone, Co. Monaghan.
>
> We are shortly lodging a planning application for works on the site, on behalf of our client Saint-Gobain Mining (Ireland) Ltd. As part of the planning application process, we've sought to compile what knowledge there is on the minor field names on the site. The names uploaded to the portal were sourced from a local person's knowledge of current field names. I attach a map and table version of the data I've uploaded to your website for reference as well. We also have had engagement with the heritage officer in Monaghan County Council who advised that there's a historical school record from the local village school (Drumgoosat) which notes (historical) field names in the area. I've provided those records on the attached document, however, we're unable to geolocate them as they only provide broad townland locations, although they do provide a broader area than that shown just on the Knocknacran West map.

We hope that these can help to provide a record of minor place names within the area. We'll also pass on the information to Cumann Gaelach Mhuineacháin and this data will be included in the upcoming planning application to Monaghan County Council as well.

Cheers,

Hannah

Hannah McGillycuddy
Associate - Environmental & Social Impact Assessment
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hmcgillycuddy@slrconsulting.com

SLR Consulting Ireland
35 Friary Street, Kilkenny, R95 FP62

The Prince's Responsible Business Network
Race at Work Charter signatory

Hannah McGillycuddy

From: Hannah McGillycuddy
Sent: 28 March 2023 16:51
To: cg.muineachan@gmail.com
Cc: Barry Balding
Subject: RE: Minor field name query
Attachments: Field Names Knocknacran West Site.docx

Hello,

I was in touch with you previously regarding a query around field names for a site we had a planning application query around. Since then, we have compiled a record of the field names from a local source. We'll be lodging a planning application shortly which will include this detail as well but please find attached a map and table providing the field names on the site. We've also uploaded the field names to the Meitheal Logainm website in Knocknacran West, Magheracloone, Co. Monaghan (https://meitheal.logainm.ie/en/). They're being validated so may not be public records yet on the map viewer.

Monaghan County Council's heritage officer had also mentioned that there's a historical field name list for the general area around our site. This is available through Duchas.ie and specifically the Drumgoosat National School records. We've included the relevant pages in the attached document, however, we've been unable to cross reference how these relate to the current list of field names we were given as the records do not include a map of the fields named.

We hope that these can help to provide a record of minor place names within the area.

Cheers,
Hannah

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From: Hannah McGillycuddy <hmcgillycuddy@slrconsulting.com>
Sent: 01 July 2022 09:21
To: cg.muineachan@gmail.com
Cc: Barry Balding <bbalding@slrconsulting.com>
Subject: Minor field name query

Good morning,

I'm emailing you with a query relating to minor field names for fields within several townlands in Co. Monaghan and am hoping that you may be able to help. I have previously been in touch with meitheal logainm and they had kindly passed on your contact details.

Would you possibly have any records for the minor field names within the townlands of Knocknacran East, Knocknacran West and Drumgoosat?

Any help you could provide in this regard would be greatly appreciated.

Thanks.

Kind regards,
Hannah

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The Prince's Responsible Business Network
Race at Work Charter signatory

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16.0 MATERIAL ASSETS

16.1 Introduction

This Chapter of the EIAR addresses the impacts of mining and sporting activities at the Application Site on material assets located in the vicinity of the Site.

Material assets comprise the physical resources in the environment, which may be of human or natural origin. The objective of the assessment contained in the following sections is to ensure that these assets have been used in a sustainable manner with respect to operations at the Site. Material Assets in the vicinity of the Site comprise of built services and infrastructure such as surface water drainage, telecommunications, electricity, gas and water supply infrastructure.

Other Material Assets include roads and traffic, and also waste management infrastructure.

16.2 Legislative and Policy Context

The European Union Directive 85/337/EC required that certain private and public projects which are likely to have significant resultant environmental impacts are subject to a formalised Environmental Impact Assessment prior to their consent. This Directive was subsequently amended by the EU through three amendments: 97/11/EC, 2003/4/EC and 2009/31/EC and then codified in Directive 2011/92/EU. Subsequently, on 16 April 2014, Directive 2011/92/EU was amended by Directive 2014/52/EU. Directive 2011/92/EU, as amended by Directive 2014/52/EU, will be hereafter referred to as the 'EIA Directive'.

Article 3 of the EIA Directive sets out the factors that should be identified, described and assessed in terms of direct and indirect significant effects of a project. Material assets are included as one of these factors. Annex IV of the EIA Directive sets down the minimum information to be supplied in an EIAR, also makes specific reference to material assets as a factor that should be described if it is likely to be significantly affected by the project.

The 2014/52/EU Directive was transposed into Irish law through European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (SI No. 296 of 2018) which amended the Planning and Development Act, 2000, and the Planning and Development Regulations, 2001. This EIAR has been produced in accordance with these relevant legislative requirements and Statutory Instruments.

16.2.1 Relevant Guidance

There is no specific Irish guidance for the assessment of material assets in the context of EIA. The 'Guidelines on the information to be contained in environmental impact assessment reports', were published by the EPA in May 2022 (2022 EIAR Guidelines) with a view to facilitating compliance with the amended EIA Directive. Therefore, these Guidelines have been considered in the course of this assessment.

The EIAR Guidelines state that material assets 'can now be taken to mean built services and infrastructure'. They suggest headings under which material assets can be addressed within an EIAR as set out in Table 16.1 below. The sub-topics listed under the heading of 'Roads and Traffic' have been dealt with in detail in Chapter 14.0 Traffic and Transport. The sub-topics listed under the heading of 'Built Services' are assessed within this chapter

The 2022 EIAR Guidelines refer to the relative ambiguity of the meaning of 'Material Assets' in comparison to other factors, and the sub-topic of waste management is included within the overall prescribed environmental factor of Material Assets. The sub topics listed under waste are addressed within this chapter.

Table 16.1: Sample Headings and Topics to address Issues arising for Material Assets

Prescribed Environmental Factor	Typical Headings under which Environmental Factors could be addressed in an EIAR	Typical Topics
Material Assets	Roads & Traffic	Construction Phase
		Operational Phase
		Unplanned Events (i.e. Accidents)
	Built Services	Electricity
		Telecommunications
		Gas
		Water Supply Infrastructure
		Sewerage
	Waste Management	Construction Waste
		Operational Waste

Note: Extracted from 2022 EIAR Guidelines, EPA

It is stated within the 2022 EIAR Guidelines that impacts such as those on agricultural land come under the factors of land and soil.

It should also be noted that in December 2022 the Department of Energy, Climate and Communications published their Policy Statement for Mineral Exploration and Mining in Ireland (Critical Raw Materials for the Circular Economy Transition). A Strategic Environmental Assessment (SEA) process was undertaken to ensure that the protection of the environment and promotion of sustainable development is considered appropriately in the development of the Policy Statement. 'Material Assets' is one of a number of environmental topics that is put forward for consideration. Under the heading of 'Material Assets', the following environmental issues have been highlighted:

- Impacts to potable water supplies;
- Impacts to commercial and agricultural activities adjacent to mines;
- Planning and development potential;
- Potential for land severance or land access to support exploration and/or mining;
- Competing with other offshore infrastructure under the National Marine Planning Framework;
- Potential risks and opportunities for mining wastes; and
- Change in land use based on risk to water quality, quantity and flooding thus reducing value of land either by limiting development potential or requiring a change in land use.

Where relevant, the above issues have been considered within the appropriate chapters of this EIAR.

16.3 Assessment Methodology and Significance Criteria

16.3.1 Technical Scope

This EIAR chapter aims to identify the likely significant effects that the Proposed Development may have on the specific material assets relevant to the proposed development. These are discussed under the following headings:

- Traffic and Transport;
- Fuel Resource Management;
- ESB Utilities Network;
- Gas Supply;
- Telecommunications;
- Magheracloone Group Water Scheme;
- Third Party Water Wells;
- Drumgoosat Dewatering Borehole;
- Wastewater Infrastructure;
- Surface Water Infrastructure;
- Local Waste Infrastructure;
- Surface Infrastructure;
- Geological Resource;
- Land Resource; and
- Scenic Routes.

16.3.2 Temporal Scope

Construction Phase

Under the current programme, it is expected that the duration of construction will be short-term and last for approximately 24 months, some construction phase elements (such as the temporary diversion of the R179, Cut-and-Cover tunnel and the relocation of the mine entrance) will be of temporary duration while construction of the Community Sports Complex will be short term.

Operational Phase

The operational phase of the development will follow and will be long-term for the mining development and permanent for the Community Sports Complex.

Restoration Phase

A restoration phase for the mining development will have permanent effects, no restoration phase is considered for the Community Sports Complex.

The EIA has been based on these assumptions, using the definitions regarding duration of effects as set out in the EPA's 2022 Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'.

16.3.3 Geographical Scope

The EIAR directly covers the physical extent of the Site as shown in the red line boundary plan (Figure 16.1). Where appropriate, the EIAR identifies the potential for impacts to users in the wider area, depending on the catchment areas for various utility infrastructure.

16.3.4 Prediction of Impacts and Effects Prior to Mitigation

This chapter of the EIAR describes the likely significant direct effects of the Proposed Development on the material assets surrounding the Proposed Development. The aim of establishing significance of impacts is to provide a measure of the risks of disturbance to, or undue burden on, existing material assets.

16.3.5 EIA Significance Terminology

The 2022 EIAR Guidelines have been followed in order to clearly identify how the significance of impacts has been assessed. This common framework follows a 'matrix approach' to environmental assessment which is based on the characteristics of the impact (magnitude and nature) and the value (sensitivity) of the receptor.

Descriptions for value (sensitivity) of receptors are provided in Table 16.2. Sensitivity is assessed based on professional judgement of importance of the assets to users surrounding the Proposed Development, and their sensitivity to potential disruption to the as-built service infrastructure.

Table 16.2: Environmental Value (Sensitivity) and Descriptions

Value (sensitivity) of Receptor / Resource	Typical Description
High	High importance and rarity, national scale, and limited potential for substitution.
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

The descriptions for magnitude of impact are provided in Table 16.3.

Table 16.3: Magnitude of Impact and Typical Descriptions

Magnitude of Impact (change)		Typical Description
High	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.
Medium	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Low	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Adverse	Very minor loss or alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.

The approach followed to derive significance from receptor value and magnitude of impacts is shown in Table 16.4. Where the table includes two significance categories, the reporting of a single significance category is supported by rationale provided in supporting text.

The assessment of magnitude of impact considers whether the change that causes the impact is positive or negative, and whether the impact is direct or indirect, short, medium- or long-term, temporary or permanent, and if it is reversible.

For the purposes of this assessment, the following definitions of duration have been used:

- Temporary - effect likely to last less than 1 year without intervention (i.e. less than the construction phase);
- Short term - effect likely to last 1 to 7 years without intervention;
- Medium term - effect likely to last 7 to 15 years without intervention;
- Long term - effect likely to last 15 to 60 years without intervention; and
- Permanent - effect likely to last over 60 years without intervention.

Table 16.4: Significance Matrix

		Magnitude of Impact (Degree of Change)			
		Negligible	Low	Medium	High
Environmental Value (Sensitivity)	High	Slight	Slight or moderate	Moderate or large	Profound
	Medium	Imperceptible or slight	Slight or moderate	Moderate	Large or profound
	Low	Imperceptible	Slight	Slight	Slight or moderate
	Negligible	Imperceptible	Imperceptible or slight	Imperceptible or slight	Slight

A description of the significance categories used is provided in Table 16.5.

Table 16.5: Significance Categories and Typical Descriptions

Significance Category	Typical Description
Profound	An effect which obliterates sensitive characteristics.
Large	An effect which, by its character, magnitude, duration or intensity alters a significant proportion of a sensitive aspect of the environment.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Imperceptible	An effect capable of measurement but without significant consequences.

Effects that are either Large or Profound are considered to be Significant, and effects that are Moderate, Slight or Imperceptible are considered to be Not Significant.

16.3.6 Information Sources

Information for the assessment of potential impacts on the identified material assets was obtained by means of a desk-based review, and included the following sources:

- Existing and proposed plant infrastructure details provided by SRL and subcontractors;
- ESB network utility plans;
- Gas Networks Ireland (GNI) utility plans;
- Eir utility mapping;
- Irish Water utility mapping;

- County Council water mapping;
- Magheracloone Group Water Scheme (MGWS) mapping;
- In-house SLR knowledge of the Application Site; and
- Aerial and ordnance survey maps of the area.

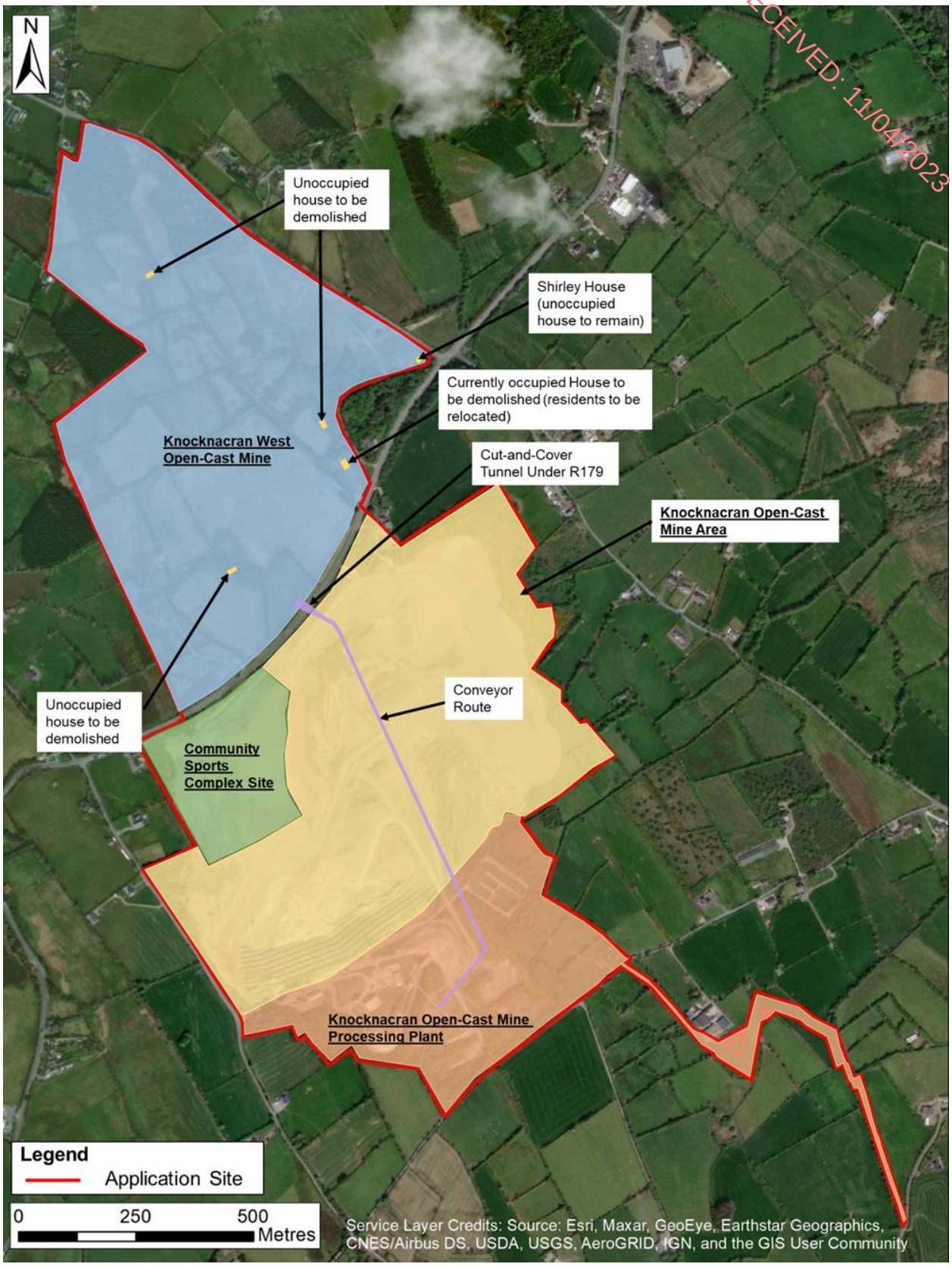

Figure 16.1: Site area

16.4 Baseline

16.4.1 General Aspects of the Surrounding Environment

An outline for the Site in the local context is provided in Figure 16.1. The existing Knocknacran Mine and Drummond Mine have been in operation since 1989 and 2003, respectively, while gypsum mining has been carried out in the area since the 1950s.

The lands surrounding the Site can be characterised as (i) rural in nature, with land uses in the area being generally agricultural, single-house residential, small-scale commercial (e.g. Drumgoosat village shop) and with a church and primary school in the village of Drumgoosat to the north of the Site; (ii) being used for the extraction and processing of gypsum for the manufacture of plaster and plasterboard; and (iii) lands having a former recreational amenity. Residential housing in the area is primarily concentrated to linear ribbon settlements along local roads.

The town of Kingscourt is located ca. 7 km south of the Site along the R179, and the town of Carrickmacross is located ca. 7 km north of the Site along the R179.

16.4.2 Traffic and Transportation

The Site is bordered to the north, south, east and west by local roads. The R179 regional road bisects the Site and marks the boundary between the existing Knocknacran Mine, Community Sports Complex and the proposed Knocknacran West Mine. The R179 is a ca. 10 m wide road with hard strips on both sides of the carriageway and a posted speed limit of 80 kph. The current R179 is a realignment of the former road. A Segment of the former R179 remains intact as an unclassified slip road connecting the R179 with the L4900 between the Knocknacran West Mine site and Knocknacran Mine site.

The existing mine entrance is located on the L4816 and there is an existing entrance on the site of the proposed Community Sports Complex. The L4816 is ca. 9 m wide with no hard shoulder or hard strip at the edge of the carriageway. Additionally, there are several existing entrances along the R179, L4900 and L49014 for both the existing Knocknacran Mine and the site of the proposed Knocknacran West Mine.

A petrol station is located on the R179, to the west of the Community Sports Complex site and to the east of the R179/L4816 junction. The petrol station is a popular pull-in spot for road users.

A Traffic and Transportation Assessment (TTA) was undertaken by PMCE in March 2023 and includes a speed survey of the L4816. This assessment is provided in Appendix 14.1 of this EIAR.

16.4.3 Fuel Resource Management

Diesel fuel is stored on the plant site for machinery. The storage of the fuel is provided on the existing plant site in oil storage tanks. The details of these tanks are provided on planning Drawings 13 and 14 in the planning set. The main diesel tank shown on Drawing 13, can store 27,000 L. At present 18,000 L of diesel is bought every 4 – 6 weeks. Other liquids such as hydraulic oil and coolant are stored in the other storage tanks within the dedicated storage area on the plant site (detailed on Drawings 03, 05, 06, 13 and 14 of the planning set).

16.4.4 ESB Network Utilities

A service map was received from the ESB on 27th February 2023 detailing both the layout of underground and overhead ESB lines on-site and in the locality. The existing Knocknacran Mine site is connected to the ESB grid by an onsite medium voltage ESB substation which connects to the overhead lines to the south of the Site by an underground line.

Overhead ESB lines traverse the Knocknacran West site, border the western side of the Community Sports Complex and border the Knocknacran Mine to the south. Power is supplied to a switchroom in the changing room block for the existing development (Reg. Ref. 20/365).

The current electrical usage at the mine site, is 23.9 KwH/tonne, Table 16.6, below. Electricity is consumed in pumping water from the Knocknacran open-cast sump to the River Bursk, crushing gypsum rock in primary and secondary crushers, and transporting the gypsum by conveyor.

All electricity is sourced from certified CO_2 neutral sources in line with SGMI corporate policy.

Table 16.6: Electricity usage during production

Process	6 month electricity usage	
Open-Cast Production in 6 month period	36,435	tonnes
Water Pumping Electricity Consumption	1,656	KwH
Processing Consumption (includes crushing and conveying)	867,796	KwH
Total Electricity Consumption	869,452	KwH
Consumption per tonne of Product	23.9	KwH / Tonne

These ESB service routes are shown on Figure 16.2 and original maps are included in Appendix 16.1.

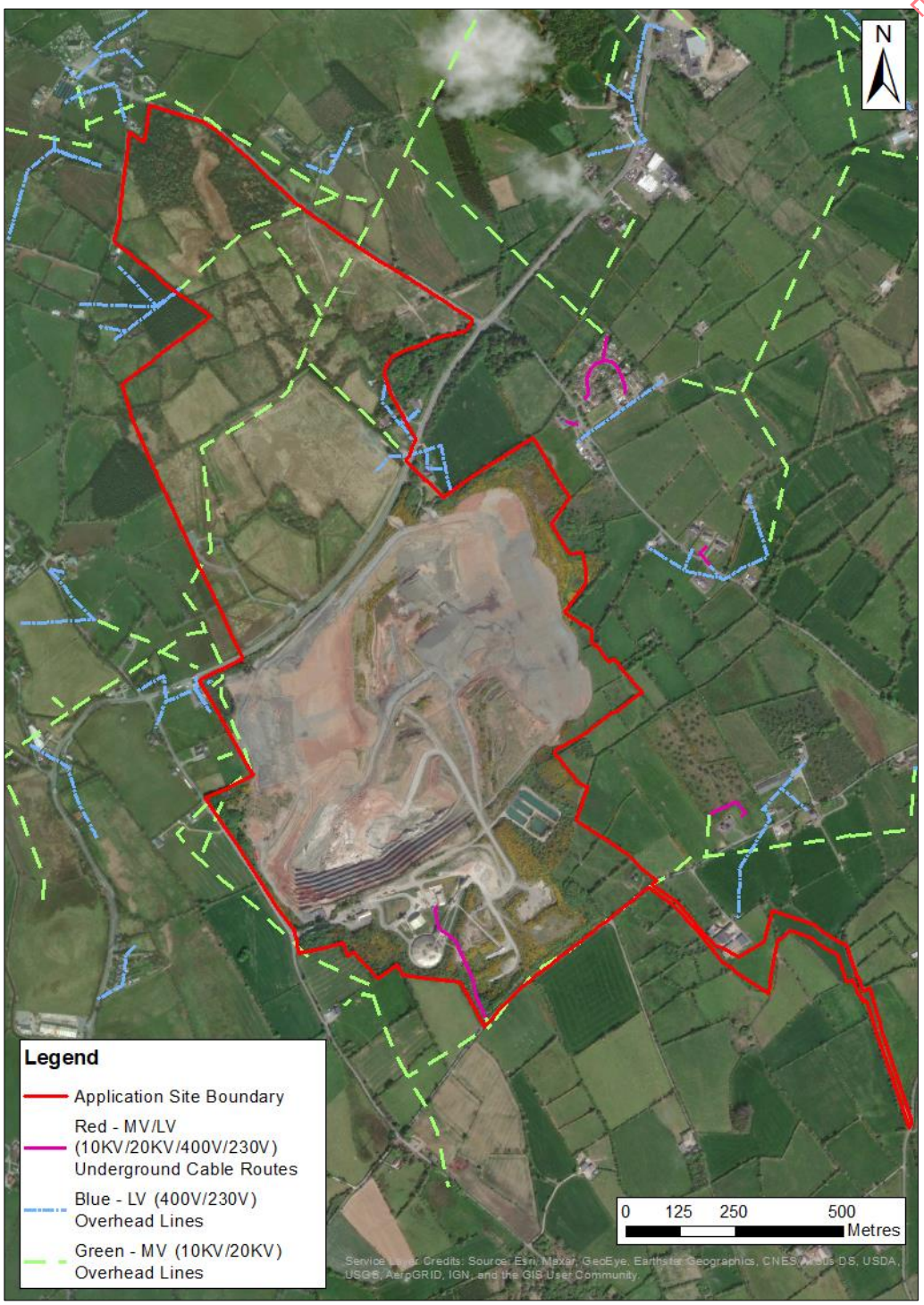

Figure 16.2: ESB Network map redrawn based on service maps

16.4.5 Gas Supply

There is a Gas Networks Ireland (GNI) 315 PE 4 bar distribution line located within the Site which services the surrounding area. This has been confirmed from GNI service drawings and communications with GNI, however, the exact location of the pipeline along the R179 will be confirmed by the Applicant prior to

construction of the proposed temporary diversion of the R179 and Cut-and-Cover Tunnel. The necessary works to ensure the safety and integrity of the gas pipeline and gas supply will be carried out in agreement and under the control/supervision of GNI subject to planning permission being granted. The works associated with the handling of the gas pipeline will form part of the enabling works for the temporary diversion road and tunnel construction.

A gas connection is being provided for in the permitted Community Sports Complex site, works are ongoing to construct this development (Reg. Ref. 20/365) and the site will be serviced by a gas connection prior to the commencement of the Proposed Development.

The pipeline as mapped follows the former R179 layout, however, it would have been previously uncovered during mining operations, as the open-cast at Knocknacran would have excavated this area historically. Communications with staff on the mine site have indicated that the pipe was relocated to follow the current R179 road, communication with MGWS has also indicated the gas pipe was uncovered during works to lay the MGWS water pipe along the current R179 alignment in the early 2000s.

The currently mapped GNI service routes have been identified on Figure 16.3 and original maps are included in Appendix 16.2.

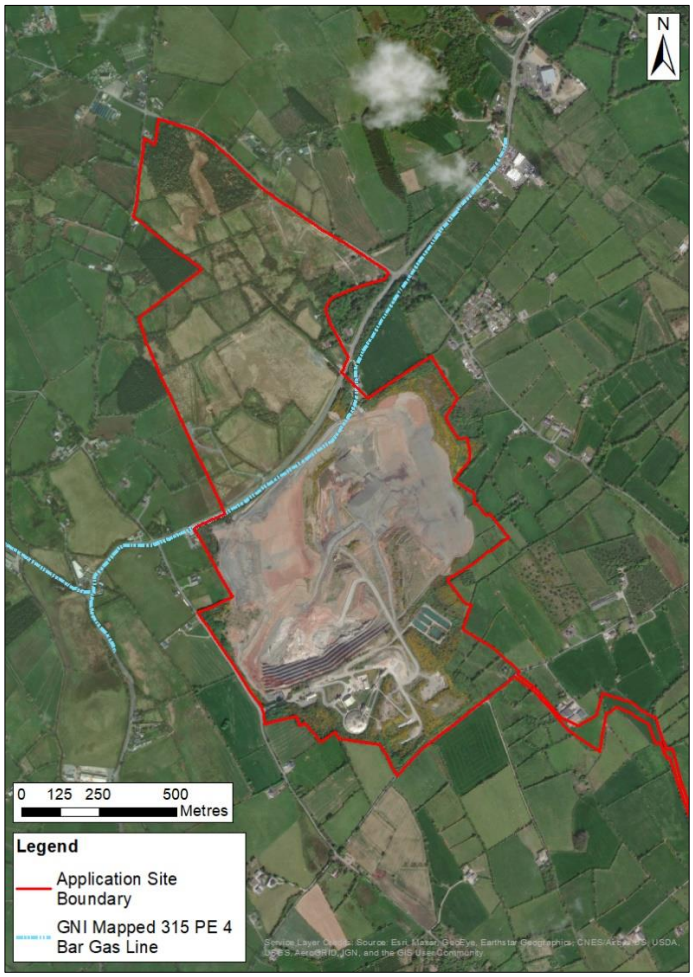

Figure 16.3: Gas service plan redrawn from GNI supplied maps

16.4.6 Telecommunications Network

The location of the existing telecommunications networks is shown in Figure 16.4 below.

Mapping has been sourced from the Eir CBYD online mapping request portal and has been re-drawn to an appropriate scale for reporting purposes.

The telecommunication services can be seen to extend from infrastructure following the road network surrounding the Site and service the one-off housing along the local roads. Similarly, to the GNI service map, the mapped telecommunication lines along the R179 follow the former road network, however, this will also be confirmed prior to any site works taking place as communication with mine staff has also indicated this pipeline was relocated adjacent to the current R179 and it has never been uncovered during mining operations. As with GNI, the necessary works to ensure the integrity of the telecommunications infrastructure where the proposed tunnel intersects the R179 will be carried out in agreement and under the control/supervision of Eir subject to planning permission being granted. The works associated with the handling of the telecommunications infrastructure will form part of the enabling works for the temporary diversion road and tunnel construction.

The permitted Community Sports Complex site (in construction, Reg. Ref 20/365) will have a connection to the telecommunications network prior to the commencement of the Proposed Development.

Figure 16.4: Telecommunications network redrawn from Eir supplied maps

16.4.7 Magheracloone Group Water Scheme

The water service provider in the area is the Magheracloone Group Water Scheme (MGWS) which comprises a ca. 132 km long distribution network. MGWS is sourced primarily from Lough Greaghlone and supplies domestic dwellings, farms, schools, churches and businesses. The existing Knocknacran and Drummond Mines are supplied by the MGWS, as will the permitted Community Sports Complex (Reg. Ref. 20/365). The MGWS services route has been digitised and redrawn from a service map provided by MGWS (Figure 16.5).

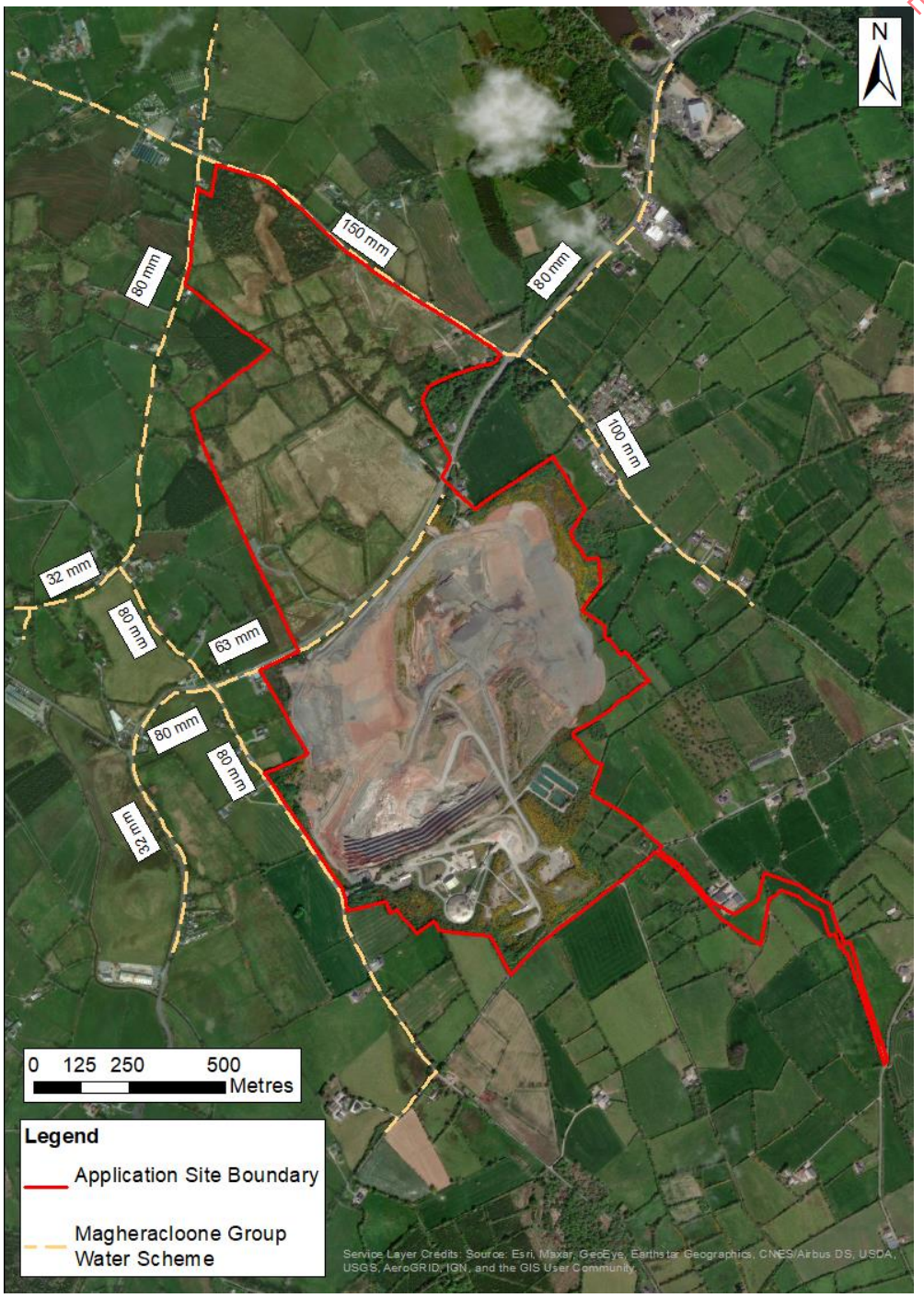

Figure 16.5: MGWS services route redrawn from MGWS service map

A 63 mm mains supply runs partially along the R179 southward. Along the L4900 a 150 mm mains runs south-easterly where it connects at the junction to an 80 mm mains running northwards along the R179. A 100 mm mains runs south-eastwards along the L8830. Along the western boundary of the Knocknacran West Mine site an 80 mm mains runs southwards from Drumgoosat village to connect to the mains at the junction with the R179. An 80 mm main also runs south-eastwards along the L4816 by the existing Knocknacran Mine site.

16.4.8 Third Party Water Wells

A third party well survey was undertaken during September 2019 to map private wells in the area (Figure 16.6). During the survey 22 wells (and springs) were recorded within 500 m of the Application Site. A total of 14 are listed as being in use, but none are currently monitored regularly. Most are used to supply water to local housing and farms; 8 are boreholes, 11 are dug wells, 2 are springs and 1 is an unknown well type (well serves two houses but inaccessible for survey). One publicly accessible 'healing spring' was recorded. Table 16.6 presents the type of well and water levels recorded in the wells during the survey (coordinates are in Irish National Grid and heights are relative to Malin).

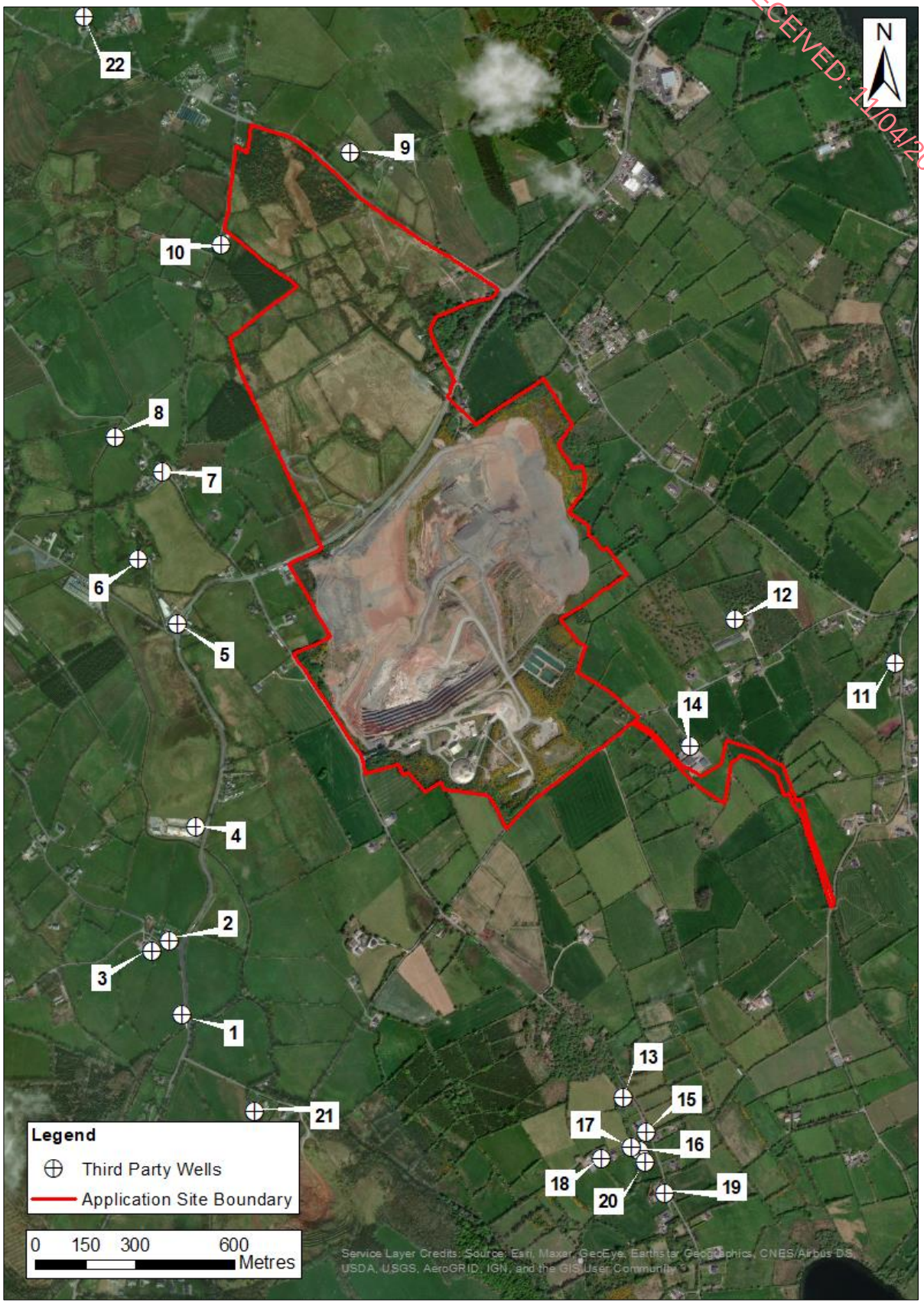

Figure 16.6: Third Party Wells offsite

Table 16.7: Domestic Well Survey - September 2019

Sampling Location	Easting	Northing	Elevation (m)	EOH (m)	EOH (mOD)	Bored/dug	Usage	Water Level (m OD)	Water Level Depth (m)
1	298242	280163	33.12	-	-	Dug	In use - domestic	32.2	0.92
2	298464	280124	36.71	45.7	-8.99	Bored	In use - domestic	34.73	1.98
3	298437	280075	37.1	-	-	Dug	In use - domestic	35.24	1.86
4	298812	280207	32.85	-	-	Bored	In use – industrial	31.36	1.49
5	299420	280147	36.46	30	6.46	Bored	Not in use	33.68	2.78
6	299618	280033	34.31	4.4	29.91	Dug	In use - domestic	32.41	1.9
7	299877	280100	37.17	5.4	31.77	Dug	In use - domestic	33.8	3.37
8	299981	279962	33.54	3.3	30.24	Dug	In use – domestic (spring well)	31.16	2.38
9	281019	300769	41.89	-	-	Bored	Not in use	33.59	8.3
10	300559	280283	47.67	4.8	42.87	Dug	Not in use	45.62	2.05
11†	299302	282311	28.59	-	-	Spring	In use – healing spring	28.59	
12*†	282146	298941	-	1.05	-	Spring	In use – agricultural	-	0.42
13	297993	281497	35.04	-	-	Bored	In use - domestic	24.32	10.72
14	299053	281693	41.65	6.0	35.65	Dug	Not in use	40.65	1.0
15	297889	281562	36.53	-	-	Bored	In use - domestic	24.43	12.1
16	297833	281539	34.3	4.7	29.6	Dug	In use - domestic	32.3	2.0
17	297847	281516	33.56	45.7	-12.14	Dug	In use – domestic	16.49	17.07
18	297809	281428	41.32	3.8	37.52	Dug	Not in use	38.57	2.75
19	297707	281618	42	-	-	Bored	In use - domestic	24.85	17.15
20*	282174	297089	-	-	-	Bored	In use - domestic	-	16.55
21	297951	280382	38.42	5.4	33.02	Dug	Not in use	35.42	3
22*	-	-	-	-	-	-	Not in use	-	-

(Note: † Spring' * Not accessible for surveying)

16.4.9 Drumgoosat Dewatering Borehole

An existing dewatering borehole is located within the proposed Community Sports Complex site. This borehole is used to dewater the Drumgoosat underground workings at present, see further details on this well in Chapter 8.0 (Water).

16.4.10 Wastewater Infrastructure

Sewerage services in the vicinity of the Site are covered by independent septic tank (or similar) systems. The existing Knocknacran and Drummond mines site's office area has an independent septic tank system (Solido Smart EBL-45 with a design capacity ca. 10 PE) and a wastewater treatment system (Oakstown Super BAF 50 PE Wastewater Treatment System with a design capacity of 46 PE) is installed and operational at the Community Sports Complex (Reg. Ref. 20/365).

16.4.11 Surface Water Infrastructure

There is no existing surface water infrastructure on the proposed Knocknacran West Mine site except drainage ditches bounding and within the site and a stream in the east of the site (refer to Chapter 8.0, Water, for further details). The existing drainage flow paths are to the south-west.

The Corduff Stream is an ephemeral stream, with negligible flows being recorded during drier months (Piteau Associates, 2022, Appendix 8.1). According to Piteau (Appendix 8.1), the existing catchment of the Corduff Stream down to Lough Fea is ca. 6.1 km^2.

Surface water occurring on the Knocknacran Mine site is directed towards the base of the open-cast prior to reporting to the water settlement lagoons, from where it is discharged via existing infrastructure to the River Bursk (under IE licence P0519-04).

The existing site for the proposed Community Sports Complex receives runoff waters from a relatively small catchment south of the R179 road.

The catchment to the north of the R179 drains to a stream which flows from east to west along the northern side of the R179.

16.4.12 Local Waste Infrastructure

The mining activities consist of the stripping of overburden and interburden (to expose gypsum) which is used on site for phased restoration. The gypsum is processed on-site before being transported to the plaster/plasterboard factory in Kingscourt. No soil or bedrock material is exported offsite as a waste material, all extracted material is used.

Waste material generated on the existing Knocknacran Mine site is normal office waste, scrap metal, waste oil, timber, tyres and plastics which are contained within designated and clearly labelled recycling and waste bins before being transported offsite for disposal by a designated waste contractor as and when required.

16.4.13 Surface Infrastructures

Surface infrastructure in the vicinity of the Site considered for this assessment includes dwellings, a national school, church, industrial and commercial facilities, and the road network.

The closest receptors within 500 m of the Site are shown in Figure 16.7. There are currently 7 non-residential facilities within 500 m of the Site, including a church, village shop, mushroom farm, national school (Drumgoosat), motor mechanic, garage and a filling station.

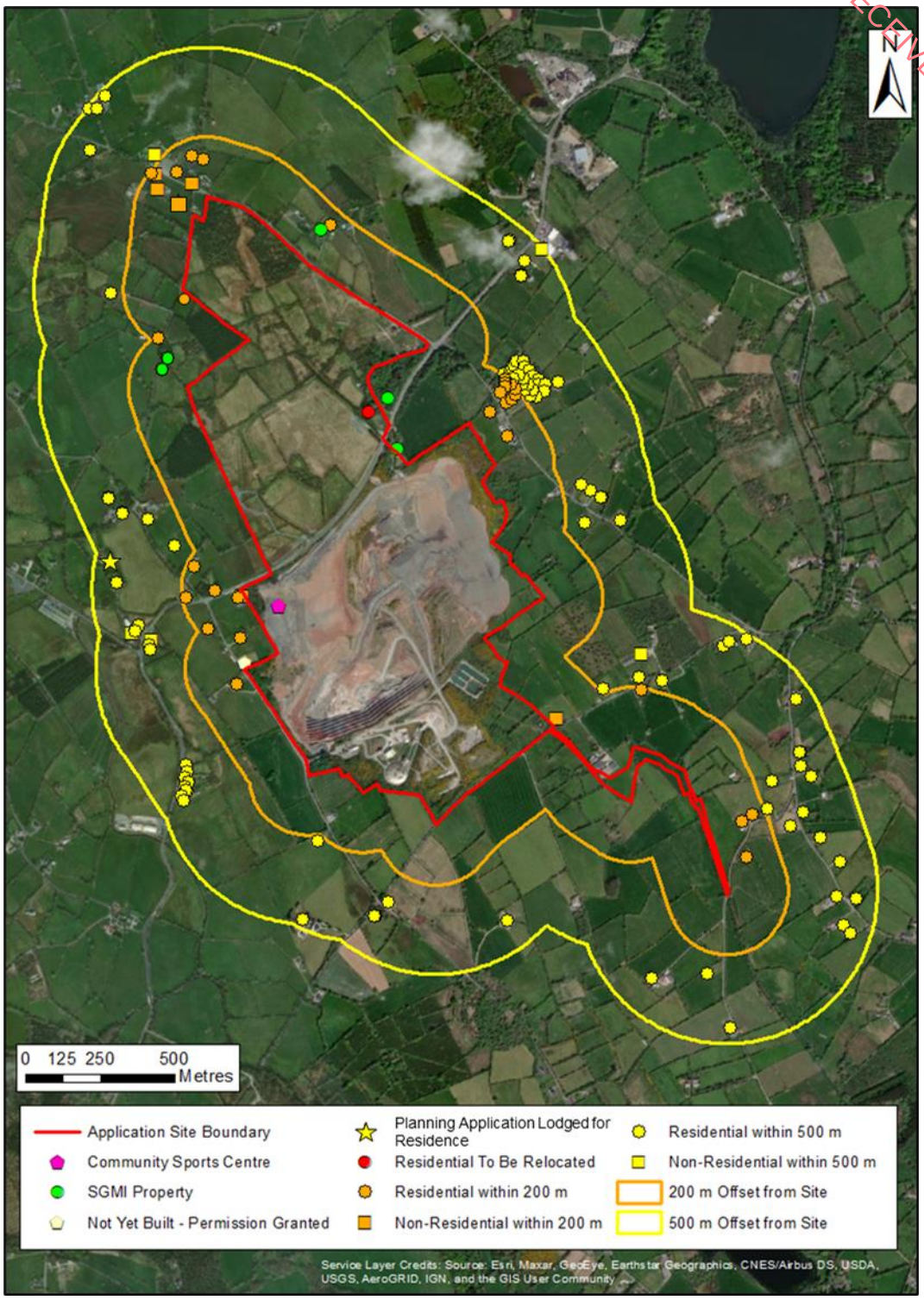

Figure 16.7: Location of receptors within 500 m of the Site

16.4.14 Geological Resource

The geology of the Site is described in detail in Chapter 7.0 (Land, Soils and Geology). As outlined previously, the existing activities undertaken at Knocknacran Mine and Drummond Mine include the extraction of gypsum for use in the construction industry which represents a geological resource and an asset which is

actively mined. Section 7.4.11 of the EIAR deals with the Geological Assets within the area; according to the extractive register on the GSI online viewer (GSI, 2023) there are no active quarries at or near the Proposed Development. Within the development site boundary is the existing Knocknacran Open-Cast Mine with the Drummond Underground Mine adjacent. In the wider Study Area, Cormey Pit is operated by Breedon Bricks to the south and a limestone quarry is in operation to the east.

According to the mineral localities layer within the GSI (2023) online viewer, several mineral localities are noted within the Study Area including gypsum, clay, shale, dolomite, coal, and marl. Clay and gypsum are currently extracted from these mineral localities.

16.4.15 Land Resource

The Site is described in detail in Chapter 3.0 (Project Description), Chapter 5.0 (Population and Human Health), Chapter 6.0 (Biodiversity) and Chapter 7.0 (Lands, Soil and Geology). Section 7.4.3 of the EIAR presents a detailed description of the land use on the Application Site and in its vicinity since 1837 to the present day.

The Application Area is ca. 140.4 ha[1], of which the proposed Knocknacran West Open-Cast Mine comprises ca. 54.3 ha; ca. 24.6 ha comprises the Knocknacran Processing Plant, ca. 8.6 ha will comprise the proposed Community Sports Complex and ca. 51.5 ha will comprise the restoration area for the existing Knocknacran Open-Cast Mine.

Lands in proximity to the Site are largely rural in nature (other than the existing Drummond Mine immediately to the south), with a mixture of farmland and one-off housing with minor ribbon development of residential properties occurs along the local road network. Industrial and commercial activities are also found within the surrounding area.

Due to the recent history and concerns about subsidence, the land on the Knocknacran West site is currently not in use as a resource.

16.4.16 Scenic Routes

The landscape surrounding the Site is characterised as 'drumlin and undulating farmland'. The Monaghan County Development Plan (2019 – 2025) identifies areas of Primary Amenity and Secondary Amenity, as well as designated scenic routes. No sensitive landscape and scenic designations occur within the vicinity of the development site. The development site is more than 20 km from any Area of Primary Amenity Value, more than 2 km from an Area of Secondary Amenity Value, and more than 10 km from any Views from Scenic Routes.

Identified in the Cavan County Development Plan (2022 – 2028) is a scenic view "SV8 – Lough an Leagh Gap." located ca. 9 km from the site, which has no views of it. No other Scenic Views exist within 30Km of the site.

Dún a Rí Forest Park straddles the south-western periphery of the study area, in County Cavan, and contains multiple short walks. There are no listed scenic views or viewpoints located in the forest park and as such it is of no relevance to the Proposed Development.

[1] The red line area encompasses a small area of the R179 (ca. 1.4 ha) which accounts for the slight discrepancy in total site area.

From the Meath County Development Plan (2021 – 2027) two views are listed are within 20 km of the site, however, while both these views are of regional significance, they are of no relevance to the site, owing to their north-easterly orientation of their views

16.5 Key Characteristics of the Proposed Development

16.5.1 Construction Phase: Community Sports Complex

During this phase, the existing Community Sports Complex will be further developed. The initial phase of this development has been constructed (Reg. Ref.: 20/365), and the next phase will involve extending the Community Sports Complex by the construction of two further playing pitches, one with a perimeter running track, an all-weather pitch, a new club building, including a sports hall, a handball alley, changing rooms & toilets, a viewing gallery, a part-covered grandstand, additional parking and associated siteworks.

16.5.2 Construction Phase: Mine Development

During this phase:

- A temporary diversion of the R179 is proposed and a Cut-and-Cover Tunnel will also be constructed;
- One residential and three unoccupied houses and sheds will be demolished;
- The existing processing plant on the existing Knocknacran Open-Cast Mine site will be refurbished; and
- A new vehicular entrance will be constructed to the existing mine site from the L4816.

16.5.3 Operational Phase: Community Sports Complex

During this phase, the Community Sports Complex will be in operation.

16.5.4 Operational Phase: Mine Development

During this phase:

- Overburden and Interburden will be stripped to expose the Gypsum Mineral;
- The gypsum remaining in the former Drumgoosat Underground Mine will be extracted by open-cast mining methods;
- The existing Knocknacran Mine will be restored to near original ground level;
- The proposed Mine Development amounts to the replacement of the loss of mining at the Knocknacran Open-Cast Mine with the mining at Knocknacran West Open-Cast Mine. Both mine sites are comparable in size and nature of operations;
- The existing plant site will process and despatch the extracted gypsum;

- The existing Drumgoosat dewatering pump, will be relocated to an existing borehole on the Knocknacran West site to continue to provide dewatering.

16.5.5 Restoration/Closure Phase: Community Sports Complex

There is no proposal to closure the Community Sports Complex development and this phase is non applicable.

16.5.6 Restoration/Closure Phase: Mine Development

During this phase:

- The new Knocknacran West site will be returned to grassland and a waterbody;
- The existing Knocknacran site will be returned to near original ground level;
- The existing Knocknacran Plant site will be partially dismantled whereby mine plant is removed; and
- In line with the current CRAMP it is presented that here that a suitable developer would be sought to utilise the general buildings existing on the existing site for a light industrial usage into the future. This would be subject to a future developer seeking the necessary permits for continuation of use and change of use from mining to a non-mining use.

16.6 Potential Effects

16.6.1 Potential Effects: Construction Phase: Community Sports Complex

Construction Phase: Community Sports Complex: Traffic and Transportation

Subject to planning permission, the construction of the remaining playing pitches and facilities is intended to commence in 2024. The construction period for the pitches is estimated to be six to nine months, with a subsequent establishment period of one year before the pitches are playable.

The remaining building and ancillary works will be undertaken during the pitch's establishment period, with all construction expected to be completed in 2026. During the construction period of the proposed Community Sports Complex a maximum of 50 cars will arrive at the site between 8.00 and 9.00 am with the same number leaving between 5.00 and 6.00 pm with an additional 20 trips per day associated with the delivery of materials to the site.

The access to the proposed Community Sports Complex will be directly from the R179 using the existing entrance (Reg. Ref. 20/365).

The traffic assessment indicates that the Proposed Development will have an Imperceptible effect on the capacity of the adjacent roads and junctions.

Potential Effects: Construction Phase: Community Sports Complex: Fuel Resource Management

Where refuelling is needed of construction vehicles, this will be conducted on the site and managed by the contractor according to the CEMP.

The sensitivity is considered to be Low, the magnitude of impact to be Negligible and the effect to be Imperceptible.

Potential Effects: Construction Phase: Community Sports Complex: ESB Network Utilities

The proposed Community Sports Complex will be serviced by the ESB connection that is already in place on the site. Any plant and machinery that requires a connection during the construction period will be accommodated by the existing connections onsite. ESB Site services were updated during the construction of the development permitted by (Reg. Ref. 20/365) in anticipation of the proposed development.

The sensitivity of the existing network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Overall, the potential impacts of this on the electricity network are considered to be Imperceptible.

Potential Effects: Construction Phase: Community Sports Complex: Gas Supply

An existing gas connection is in place which services the initial development (Reg. Ref. 20/365). This connection will be extended to service the proposed further development of the Community Sports Complex.

Any proposed works to connect the existing line to the new buildings will be conducted in agreement with GNI and in accordance with relevant guidance for the works.

The sensitivity of the existing network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect on the GNI network is considered to be Imperceptible.

Potential Effects: Construction Phase: Community Sports Complex: Telecommunications Network

A connection is agreed and in place for the current permitted development (Reg. Ref. 20/365). This will be extended to the additional facilities building during the construction phase.

The sensitivity of the existing network is considered to be Negligible and the of impact is considered to be Negligible (Adverse). Therefore, the effect is considered to be Imperceptible.

Potential Effects: Construction Phase: Community Sports Complex: Magheracloone Group Water Scheme

During the construction phase, there is no direct need for a connection to the MGWS, however, it will be established during this period and workers onsite may use the existing facilities and MGWS supply during the course of activities.

The sensitivity of the network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). The effects of the proposed Community Sports Complex on the MGWS network are considered to be Imperceptible.

Potential Effects: Construction Phase: Community Sports Complex: Third Party Well Network

As stated previously, the proposed further development of the Community Sports Complex will use the existing connection to the MGWS network. The sensitivity of the existing wells is considered to be Medium and the magnitude of impact is considered to be Negligible (Adverse). The significance of the effect is considered to be Imperceptible.

Potential Effects: Construction Phase: Community Sports Complex: Drumgoosat Dewatering Borehole

An existing dewatering borehole is located within the proposed Community Sports Complex site. This will be relocated to the existing monitoring well at Knocknacran West. Its relocation enables development of the running track.

The sensitivity of the borehole is considered to be Low. The magnitude of impact is considered to be Negligible (beneficial) as its relocation enables development of the running track and the effect of this is considered to be Imperceptible.

Potential Effects: Construction Phase: Community Sports Complex: Wastewater Infrastructure

The existing wastewater treatment system (Oakstown Super BAF 50 PE Wastewater Treatment System with a design capacity of 46 PE) is permitted for the Community Sports Complex (Reg. Ref. 20/365) and will be available for use during the construction of the proposed further development of the Community Sports Complex.

Given that the proposed Community Sports Complex will have an independent wastewater infrastructure, no impact is envisaged on the surrounding private septic tank system in the area.

The sensitivity of the existing system is considered to be Negligible, the magnitude of impact due to the additional connection from the further development is considered to be Negligible (adverse). The effect of this is considered to be Imperceptible.

Potential Effects: Construction Phase: Community Sports Complex: Surface Water Infrastructure

A surface water management system was designed for the construction of the first phase of the Community Sports Complex development. The first phase of the development was granted planning permission under Reg. Ref.: 20/365. The surface water management system was designed/sized so that construction related water was routed through a temporary management system into the existing mine water management system.

For the further development of the Community Sports Complex development, presented here, it is proposed that surface water management during the construction will again be routed through the existing mine water management system.

The existing site for the proposed Community Sports Complex receives runoff waters from a relatively small catchment south of the R179 road. This catchment will drain through an attenuation tank before passing through a Class 1 By-Pass Petrol Interceptor prior to discharging to a culvert under the R179, where it will intersect with an existing stream which flows to the west (refer to Reg. Ref.: 20/365).

The sensitivity of the drainage system (into Knocknacran) is considered to be Negligible, the magnitude of impact to be Negligible (adverse) and the effect of this during construction works is considered to be Imperceptible.

Potential Effects: Construction Phase: Community Sports Complex: Surface Infrastructure

The construction phase will have no impact or effect on the surface infrastructure (dwellings, business, etc.) surrounding the site. The sensitivity is considered to be Medium and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect is considered to be Imperceptible.

Potential Effects: Construction Phase: Community Sports Complex: Local Waste Infrastructure

During the construction phase, waste generated on the site will be removed from site and disposed of by a licenced contractor and taken to an approved disposal site. The sensitivity of the waste infrastructure is considered to be Low, the magnitude of impact to be Negligible (adverse) and the effect of this during construction works is considered to be Imperceptible.

Potential Effects: Construction Phase: Community Sports Complex: Geological Asset

The proposed Community Sports Complex will have no direct impact on the existing geological resource in the area, it is partially located over a backfilled section of the former open-cast mine and the resource has already been exploited in the area. This is scoped out of further consideration as the asset is no longer present and an impact is not applicable, nor can a significance of the effect be considered with the asset being absent.

Potential Effects: Construction Phase: Community Sports Complex: Land Resource

The proposed further development of the Community Sports Complex is located on the existing Community Sports Complex site. The sensitivity of the existing land is considered to be Low and the magnitude of the impact is considered to be Medium (Beneficial), therefore the effect is considered to be of Slight significance.

Potential Effects: Construction Phase: Community Sports Complex: Scenic Routes

There are no scenic routes (views/viewpoints) in proximity to the proposed Community Sports Complex. In addition, the proposal represents a further development of an existing and established feature in the landscape. The sensitivity of the scenic routes is considered to be Negligible, the magnitude of impact to be Negligible (adverse) and the effect of this during construction works is considered to be Imperceptible.

16.6.2 Potential Effects: Construction Phase: Mine Development

Potential Effects: Construction Phase: Mine Development: Traffic and Transportation

As part of the proposed mine works, a temporary diversion of the R179 is required to enable construction of the Cut-And-Cover Tunnel beneath the R179 which will allow hauling of material from the mining area to the existing mine site eliminating use of the public road network during the operational life of the mine sites (Appendix 3.4 contains details of the temporary road diversion).

The construction of the tunnel is predicted to take approximately six to nine months (including road diversion construction), during which time a temporary “Road Works” speed limit of 60 km/hr will apply to the temporary diversion. The diversion will be a two-lane diversion allowing for both lanes of traffic to remain open. The diversion will be constructed prior to the closing of the existing R179 to enable movement of traffic to be maintained by the diverted R179. A Stage 1 & 2 road safety audit has been completed on the diversion by Bruton Consulting Engineers (Appendix 14.1 of this EIAR).

The Cut-And-Cover Tunnel will consist of two precast reinforced concrete box tunnels at the same location beneath the R179 which will allow one tunnel to house a conveyor and a second tunnel for vehicular access.

During the construction phase, access to the site of the proposed Knocknacran West Open-Cast Mine will be facilitated by a contractors’ yard to the northeast of the Site which will be in use during the construction phase.

Construction traffic associated with the new tunnel and proposed mine is forecast to be 20 trips (10 arrivals and 10 departures) per day associated with construction staff/operatives travelling to/from the Site, and approximately 40 trips (20 loads) per day associated with the delivery of materials to site.

The existing entrance (from 1985) to the mine is located on the L4816 , the required visibility to the south along the L4816 from the mine access remains below that required according to 2023 standards. To mitigate this the existing Mine Access is proposed to be modified to achieve a 90 m sightline in this direction.

The traffic assessment indicates that the Proposed Development will have an Imperceptible effect on the capacity of the adjacent roads and junctions.

Potential Effects: Construction Phase: Mine Development: Fuel Resource Management

Where refuelling is needed, this will be managed by the contractor according to the CEMP and occur within the construction compound associated with the temporary diversion or Cut-and-Cover tunnel. This will be of a temporary nature given the works will be completed in less than a year (i.e. 6 – 9 months). Construction vehicles associated with the mine entrance will use fuel which is stored on the existing Knocknacran Mine site. Vehicles associated with the screening berms or demolition of the houses will be refuelled in either the construction compound or Knocknacran Mine site, so there will be no requirement for fuel resource management in these working areas.

The sensitivity of this is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). The significance of the effect is considered to be Imperceptible.

Potential Effects: Construction Phase: Mine Development: ESB Network Utilities

The Proposed Development of Knocknacran West Mine will require the removal and realignment of the overhead ESB lines which currently crosscut the site. This has been successfully completed previously for Knocknacran Mine during its operational life and no complications are envisaged for this process at Knocknacran West Open-Cast Mine. The ESB has been contacted regarding the necessary steps to take and a form requesting relocation of structures has been received by SGMI. An ESB transformer connection will be located on the Knocknacran West site to allow for a power supply to the welfare facilities (canteen/office/welfare for workers) and the semi-mobile crusher on this site.

The sensitivity of the existing network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Overall, the potential effect of this on the electricity network are considered to be Imperceptible.

Potential Effects: Construction Phase: Mine Development: Gas Supply

Communication has been initiated with GNI for the mining development and confirmation of the location of the gas pipe will be undertaken by trial digging and services scanning prior to construction of the temporary road diversion and tunnel. A temporary alteration to the gas line will be required to facilitate the construction works to ensure that there will be no effects on the surrounding GNI infrastructure and supply as a result of the proposed works. No gas connection is proposed for the mine development sites.

Any proposed works will be conducted in agreement with GNI and in accordance with relevant guidance for the works.

The sensitivity of the existing network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect of the Proposed Development on the GNI work is considered to be Imperceptible.

Potential Effects: Construction Phase: Mine Development: Telecommunications Network

Based on existing service mapping the proposed construction works for the Cut-and-Cover Tunnel under the R179 will be carried out beneath the existing underground telecommunication line. Similar to the GNI line, the telecommunication line's mapped location is considered to be inaccurate, and confirmation of the line's location will be undertaken prior to any construction works by trial digging and services scanning. Any proposed works which may have the potential to interact with existing telecommunication lines will be conducted in agreement with the relevant telecommunications providers and in accordance with relevant guidance for the works.

The sensitivity of the existing network is considered to be Negligible, and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect of this on the telecommunications network is Imperceptible.

Potential Effects: Construction Phase: Mine Development: Magheracloone Group Water Scheme

The proposed Knocknacran West Mine will require a connection to the MGWS to service the worker's facilities (office/canteen/welfare) on this site. An application to connect to the MGWS has been submitted by the Applicant (Appendix 16.3). Given that the mining development seeks to maintain existing employment numbers, it is not envisaged that there will be an impact on the existing MGWS supply network.

Where the MGWS supply intersects where the tunnel is proposed, the pipe supplying the water will be temporarily re-directed to ensure continued supply of water during the construction of the tunnel and will be reinstated following completion of the works. Agreement on the scope of works to ensure the integrity of the mains and supply of water will be agreed with the MGWS and Local Authority prior to construction of the tunnel, subject to planning permission being granted. The works associated with the handling of the water mains will form part of the enabling works for the temporary diversion road and tunnel construction.

The sensitivity of the existing network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). The effects of the proposed mining activities on the MGWS are considered to be Imperceptible.

Potential Effects: Construction Phase: Mine Development: Third Party Well Network

The construction phase of the mine development will not have an impact or effect on the third party network and is not considered further here. The sensitivity of the existing wells is considered to be Medium and the magnitude of impact is considered to be Negligible (Adverse). The significance of the effect is considered to be Imperceptible.

Potential Effects: Construction Phase: Mine Development: Drumgoosat Dewatering Borehole

The Drumgoosat dewatering borehole will not be relocated during the construction phase of the mine development and it is scoped out of this assessment phase as it remains unimpacted and unaffected during this phase, no change is presented here.

Construction Phase: Mine Development: Wastewater Infrastructure

Temporary portable wastewater facilities will be provided in the construction compound associated with the temporary R179 road diversion and the Cut-and-Cover Tunnel sites. Workers relocating the mine entrance will use existing wastewater facilities in the mine office and workers for the demolition of the houses and screening berms will use either the contractors compound or existing mine site office in Knocknacran.

In addition, a wastewater treatment system will be constructed on the Knocknacran West Open-Cast Mine site during the construction phase (as provided in Appendix 3.2, an Oakstown Super BAF 10 PE Wastewater Treatment System will be installed). This system will be located near the office and welfare facilities and within a berm to allow the sand polishing filter to be underlain by silt soil as permeability testing on the natural ground indicate poor drainage. This will be constructed towards the end of the mine construction phase and will be used for the future operational phase.

Given that the construction phase for the mine development will have an independent wastewater infrastructure, no impact is envisaged on the surrounding private septic tank system in the area.

The sensitivity is considered to be Negligible, and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect of this on the wastewater network is considered to be Imperceptible.

Potential Effects: Construction Phase: Mine Development: Surface Water Infrastructure

The existing drainage flow paths are to the south-west for the temporary diversion site (and Cut-and-Cover tunnel) and there is a limited catchment area on the north side of the temporary diversion as the topography rises and diverts the drainage to the west and north. On the south side of the temporary diversion, the topography falls to the south and south-west and drainage will enter the existing flow paths alongside the R179.

In advance of the proposed works, an interceptor ditch will be excavated on the north side of the temporary diversion and a bund will be formed on the south side to intercept and/or divert the green-field run-off from adjacent land falling towards the proposed alignment.

Where existing ditches are cut-off by the temporary diversion, culverts will be installed during the subgrade construction to maintain the drainage flow paths. A filter drain will be constructed along the north side of the temporary diversion. Manholes will be placed at intervals of 100 m, and/or at intercepts with existing ditches, along the filter drain, acting as intermediate outfalls.

Drawing KNCN-WSP-HAW-SW-GN-Z-CH, Appendix 3.4 provides further details of the drainage system for the proposed temporary diversion.

The proposed development has no impact on the drainage for the current or reinstated alignment for the R179. Drainage from the R179 will enter the existing filter drain on the north side of the road. This filter drain will be reinstated over the length of the extent removed during the temporary diversion excavation works.

Works associated with screening berm construction and house demolition will be designed so that any surface waters in the works areas are routed back to the interceptor ditch associated with the temporary diversion site. Works associated with the mine entrance are unlikely to generate much surface water due to the very temporary nature of the works (in the range of days to 2 weeks), however, should surface water pond in the works, this will be diverted back to Knocknacran existing water management system.

In addition, during this stage, a segment of the Corduff Stream will be cut off by the development. The Corduff Stream is an ephemeral stream, with negligible flows being recorded during drier months (Piteau Associates, 2022, Appendix 8.1). According to Piteau (Appendix 8.1), the existing catchment of the Corduff Stream down to Lough Fea is ca. 6.1 km^2. Of this, the proposed mine footprint area will capture a drainage area of ca. 0.45 km^2. However, some of this surface water is already captured by topographic depressions on the site and the effective contributing area is less than 0.45 km^2. Flows within the development footprint will contribute little (if any) to the stream during the summer.

The sensitivity of the existing network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect is considered to be Imperceptible.

Potential Effects: Construction Phase: Mine Development: Local Waste Infrastructure

A Resource Waste Management Plan (RWMP) had been prepared for the mine construction development (Appendix 3.7).

The bituminous surfacing from the R179 footprint of the Tunnel and the tie-ins at either end of the temporary diversion will be removed from site and transported off-site to a licensed facility for reuse, recovery and/or recycling. Similarly, the removal of the bituminous surfacing from the temporary diversion when no longer required will generate waste volumes. The capping rock fill layers will be available for re-use in the works for the construction of site access roads and compound yards.

The excavated soil materials from the footprint of the temporary diversion and the Cut-and-Cover Tunnel will be available for re-use in the works for the construction of the screening berm or placed for restoration in the Knocknacran Open-Cast.

Scraps and offcuts from the construction items (fencing, pipes and geosynthetics) for the temporary diversion and the Cut-and-Cover Tunnel will be collected and segregated at the work areas by the Contractor and transported off-site to suitably authorised waste facilities for reuse, recovery and/or recycling.

Maintenance of construction plant is expected to be undertaken within the site by the contractor and all maintenance wastes, including lubricants, shall be handled, stored and disposed of to a suitably authorised waste facilities by the contractor.

The design proposal is deemed to provide substantial economic savings and provides a high level of sustainability through design that incorporates waste prevention, re-use, and recycling of resources on Site.

The following methods of waste reduction/reuse will be used during the construction phase:

- Re-use of topsoil and subsoil for screening berms or future landscaping;
- Re-use of inert material from demolition for capping for site roads and compounds; and
- Optimum recovery of assets/resource on site.

A Refurbishment & Demolition Asbestos Survey has been conducted for the houses scheduled for demolition in order to ascertain the presence of asbestos based materials, identify any other potentially hazardous materials and to provide a preliminary assessment of other materials present (Appendix 3.7).

Asbestos has been confirmed in three of the structures; in insulation board, slate strips on gables, gaskets, pipe and cowl, roof sheeting and gutter. A specialist asbestos contractor will be engaged to remove this material during the demolition works.

Salvage of items such as exterior brickwork on the structures will be implemented where possible. If re-use is possible of this material and the material is inert, then this will be implemented rather than re-use capping for site access roads or compound yards.

A specialist demolition waste contractor will also be appointed to oversee the removal, collection and segregation waste streams on the site and their appropriate and authorised removal from Site during demolition works.

Asbestos recovered during the demolition works of the structures will be removed by a licenced waste specialist (Enva). They will be responsible for collection, transport and properly disposal of the waste.

Inert materials comprising concrete, blockwork and rock fill will be separated and stockpiled for re-use as capping for site access roads and compound yards.

Timber will be segregated into separate skips onsite, other wastes (e.g., bulky waste) will be placed in a combined skip for handling at an authorised waste facility.

Valuable materials such as cut building stone and natural roofing slates will be removed carefully to avoid damage and make available for re-use.

Categorised waste will be sent to McElvaney's Waste and Recycling, Scotch Corner Recycling Centre, Annyalla, Castleblaney, Co. Monaghan, A57 P267 during the construction/demolition phase of the proposed development.

The sensitivity is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect is considered to be Imperceptible.

Potential Effects: Construction Phase: Mine Development: Surface Infrastructure

The temporary diversion road works have been designed so that ties ins end prior to the entrance to both the Community Sports Complex and a residential house on either side of the diversion.

The sensitivity is considered to be Medium and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect is considered to be Imperceptible.

Potential Effects: Construction Phase: Mine Development: Geological Asset

The geological asset will not be directly impacted or affected by the mine construction phase as no impact occurs during this phase. It is scoped out of assessment in this phase.

Potential Effects: Construction Phase: Mine Development: Land Resource

The existing land on the Knocknacran site will remain in use as a mine site during the construction phase. The Knocknacran West site does not currently have a designated land use given its recent subsidence history. The construction phase on the site is considered to be an acceptable use of the land with the aim of allowing future development which can ease concerns associated with the land.

The sensitivity is considered to be Low and the magnitude of impact is considered to be Low (beneficial). Therefore, the effect is considered to be Slight.

Potential Effects: Construction Phase: Mine Development: Scenic Routes

The landscape surrounding the Site is characterised as 'drumlin and undulating farmland'.

Chapter 13.0 (Landscape and Visual) demonstrates that the proposed mine development will not have any material effect on the prevailing landscape character or alter views of the mine from surrounding receptors.

The sensitivity of the scenic routes is considered to be Negligible, the magnitude of impact to be Negligible (adverse) and the effect of this during construction works is considered to be Imperceptible.

16.6.3 Potential Effects: Operational Phase: Community Sports Complex

Potential Effects: Operational Phase: Community Sports Complex: Traffic and Transportation

The access to the proposed Community Sports Complex will be directly from the R179 using the existing entrance (Reg. Ref. 20/365).

The Nett Floor Area of the proposed GAA building is approximately 2,135 m^2,. This equates to a minimum requirement of 43 car parking spaces. However, the Applicant has included plans for 100 formal parking spaces on the site (between Reg. Ref. 20/365 and the proposed development). The proposed development will also provide informal parking (overspill), which may be in use occasionally for match fixtures.

EV parking will be provided within the proposed formal parking area at a ratio of 10%.

The traffic assessment indicates that the Proposed Development will have an Imperceptible effect on the capacity of the adjacent roads and junctions.

Potential Effects: Operational Phase: Community Sports Complex: Fuel Resource Management

There will be no requirement for fuel storage for vehicles to be refuelled onsite and so there is no requirement to manage this resource. The sensitivity is considered to be Low, the magnitude of impact to be Negligible and the effect to be Imperceptible.

Potential Effects: Operational Phase: Community Sports Complex: ESB Network Utilities

The switchroom within the changing room block will allow for facility connections within the site. The local ESB network was upgraded with the building of the initial phase of works.

The sensitivity of the existing network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Overall, the potential impacts of this on the electricity network are considered to be Imperceptible.

Potential Effects: Operational Phase: Community Sports Complex: Gas Supply

It is not envisaged that this connection would negatively impact the existing GNI infrastructure in the area as the development has been planned with previous development carried out on the site already.

The sensitivity of the existing network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect on the ESB network is considered to be Imperceptible.

Potential Effects: Operational Phase: Community Sports Complex: Telecommunications Network

It is not envisaged that this connection would negatively impact the existing telecommunications infrastructure in the area as services have been already provided to the site with the initial phase of development.

The sensitivity of the existing network is considered to be Negligible and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect on the telecommunications network is considered to be Imperceptible.

Potential Effects: Operational Phase: Community Sports Complex: Magheracloone Group Water Scheme

As the former Community Sports Complex was an existing facility within the area and Reg. Ref. 20/365 has been constructed and is operational, it is not envisaged that the proposed facility will greatly impact on the supply to the area. Normal usage of the facilities will continue by the existing club members for the proposed facility. There may be an increased demand on the network due to matches or sporting events, however, this would be infrequent and for a short duration (several hours every few weeks).

The magnitude of impact is considered to be Negligible (Adverse) and the sensitivity of the network is considered to be Low. The effects of the proposed Community Sports Complex on the MGWS network are considered to be Imperceptible.

Potential Effects: Operational Phase: Community Sports Complex: Third Party Well Network

As stated previously, the proposed further development of the Community Sports Complex will use a connection to the MGWS network. The sensitivity of the existing wells is considered to be Medium and the magnitude of impact is considered to be Negligible (Adverse). The significance of the effect is considered to be Imperceptible.

Potential Effects: Operational Phase: Community Sports Complex: Drumgoosat Dewatering Borehole

There will no longer be a dewatering borehole on this site during the operational phase as it will have been decommissioned. Therefore, there will be no impact or effect and it is scoped out in this phase for consideration.

Potential Effects: Operational Phase: Community Sports Complex: Wastewater Infrastructure

Given that the proposed Community Sports Complex will have an independent wastewater infrastructure, no impact is envisaged on the surrounding private septic tank system in the area.

The existing (Reg. Ref. 20/365) wastewater treatment system was sized to accommodate a further development of the Community Sports Complex. Therefore, the sensitivity of the existing system is considered to be Negligible, the magnitude of impact due to the additional connection from the further development is considered to be Negligible (adverse). The effect of this is considered to be Imperceptible.

Potential Effects: Operational Phase: Community Sports Complex: Surface Water Infrastructure

The existing site for the proposed Community Sports Complex receives runoff waters from a relatively small catchment south of the R179 road. This catchment will drain through an attenuation tank before passing through a Class 1 By-Pass Petrol Interceptor prior to discharging to a culvert under the R179, where it will insect with an existing stream which flows to the west (refer to Reg. Ref.: 20/365).

The catchment to the north of the R179 drains to a stream which flows from east to west along the northern side of the R179.

A surface water drainage design report provided, by Hydrocare Environmental Ltd., is included in Appendix 3.4.

The sensitivity is considered to be Low, and the magnitude of impact is considered to be Negligible (Adverse). As such, the effect is deemed to be Imperceptible.

Potential Effects: Operational Phase: Community Sports Complex: Local Waste Infrastructure

The activities on the proposed Community Sports Complex site will create minimal waste onsite. Designated recycling and 'domestic' style waste bins will be kept onsite for the disposal of any waste material. Waste will be collected by a waste contractor on designated days and taken to suitable disposal facilities.

Overall, these effects on waste infrastructure are considered to be Imperceptible (Low sensitivity and Negligible (adverse) impact magnitude) and will not impact the surrounding locality.

Potential Effects: Construction Phase: Community Sports Complex: Surface Infrastructure

The operational phase will have no impact or effect on the surface infrastructure surrounding the site. It is not considered further here. The sensitivity is considered to be Medium and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect is considered to be Imperceptible.

Potential Effects: Operational Phase: Community Sports Complex: Geological Asset

The proposed Community Sports Complex will have no direct impact on the existing geological resource in the area, it is partially sited over a backfilled section of the former open-cast mine and the resource has already been exploited in the area. This is scoped out of further consideration as the asset is no longer present and an impact is not applicable, nor can a significance of the effect be considered with the asset being absent.

Potential Effects: Operational Phase: Community Sports Complex: Land Resource

The proposed further development of the Community Sports Complex is located on the existing Community Sports Complex site. The sensitivity of the existing land is considered to be Low and the magnitude of the impact is considered to be Medium (Beneficial), therefore the effect is considered to be of Slight significance.

Potential Effects: Operational Phase: Community Sports Complex: Scenic Routes

There are no scenic routes (views/viewpoints) in proximity to the proposed Community Sports Complex. In addition, the proposal represents a further development of an existing and established feature in the landscape.

The sensitivity of the scenic routes is considered to be Negligible, the magnitude of impact to be Negligible (adverse) and the effect of this during construction works is considered to be Imperceptible.

16.6.4 Potential Effects: Operational Phase: Mine Development

Potential Effects: Operational Phase: Mine Development: Traffic and Transportation

A Traffic and Transport Assessment (TTA) was undertaken by PMCE in February 2023 to assess the potential impacts of the Proposed Development on the surrounding road infrastructure. A copy of the TTA is included in Appendix 14.1.

The proposed mine development will seek to maintain current staff levels at the site, including full-time and occasional staff numbers. Therefore, the current parking provision is considered to adequate within the site.

As part of the TTA, traffic counts (12-Hour classified counts) were carried out at three junctions, including the existing mine access, the R1 79/L481 6/L49014 Crossroads and the R179/L4900/L8830 Staggered Crossroads. The total daily trips associated with the mine operation accounts for 330 movements daily, 140 of which relate to HGV's (52%). This number of trips is conservative and allows for periods where the removal of gypsum occurs in concentrated peaks (i.e. worst-case scenario). The production from the Mine will be aligned with what is already permitted under Reg. Refs. 17/217 and 03/578.

Link capacity analysis was carried out on the R179, L4816, L49014, L4900 and L8830 and it was determined that each road will continue to operate within capacity for each of the assessment years (including construction and operational phases) 2021, 2024, 2025, 2026 for the Opening Year, 2031 and 2041.

Junction capacity analysis was undertaken at the five junctions listed below:

- Junction 1 - Existing Mine Access;
- Junction 2 - R179/L4816/L49014 Crossroads;
- Junction 3 – R179/L4900/L8830 Staggered Crossroads; and
- Junction 2A - Proposed Community Complex Access.

The results of the Junction Capacity Analysis indicate that all junctions will continue to operate within capacity for each of the assessment years (including construction and operational phases) 2021, 2024, 2025, 2026 for the Opening Year, 2031 and 2041.

The traffic assessment indicates that this will have an Imperceptible effect on the capacity of the adjacent roads and junctions.

Potential Effects: Operational Phase: Mine Development: Fuel Resource Management

Given that there are existing storage facilities on the Knocknacran Mine site and that there will be no increased demand for storage onsite; the sensitivity of the site from a resource management perspective is considered to be negligible.

The sensitivity of is considered to be Low, the magnitude of impact is considered to be Negligible, and the significance of the effect is considered to be Imperceptible.

The Applicant will seek to reduce diesel fuel usage onsite and diversify the mine fleet over the development life with the substitution of electric vehicles, where appropriate.

Potential Effects: Operational Phase: Mine Development: ESB Network Utilities

Knocknacran West Open-Cast Mine will be serviced from a 1 MVA transformer to be located on the northern side of the Cut-and-Cover Tunnel entrance adjacent to the proposed Knocknacran West site office.

The sensitivity of the existing network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Overall, the potential effects of this on the electricity network are considered to be Imperceptible.

Potential Effects: Operational Phase: Mine Development: Gas Supply

The is no proposed change in gas needs from, or impact to gas infrastructure due to, the operational phase of the mine development. The sensitivity of the existing network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect on the GNI network is considered to be Imperceptible.

Potential Effects: Operational Phase: Mine Development: Telecommunications Network

The is no proposed change in telecommunication needs from, or impact to telecommunications infrastructure due to, the operational phase of the mine development. The sensitivity of the existing network is considered to be Negligible, and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect of this on the telecommunications network is Imperceptible.

Potential Effects: Operational Phase: Mine Development: Magheracloone Group Water Scheme

The mining development seeks to maintain existing employment numbers, it is not envisaged that there will be an impact on the existing MGWS supply network.

The sensitivity of the existing network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). The effects of the proposed mining activities on the MGWS are considered to be Imperceptible.

Potential Effects: Operational Phase: Mine Development: Third Party Well Network

Based on the detailed available information outlined in Chapter 8.0 (Water) and Section 16.4.7, existing local and community water supply systems are hydraulically disconnected and isolated from the gypsum mining areas. The sensitivity of the existing wells is considered to be Medium and the magnitude of impact is considered to be Negligible (Adverse). The effects of the proposed mining works on existing supplies is considered to be Imperceptible.

Potential Effects: Operational Phase: Mine Development: Drumgoosat Dewatering Borehole

An existing dewatering borehole is located within the proposed Community Sports Complex site. A separate existing monitoring well (refer to Planning Drawing set (Dwg. 04 series) for location details) is located on the Knocknacran West site. It is proposed that the existing dewatering borehole will be decommissioned and the existing monitoring well on the Knocknacran West site is instead used as a dewatering well.

Infrastructure including pump and piping will be emplaced for use of the well as a dewatering borehole for the Drumgoosat workings during the operational life of the Knocknacran West Open-Cast Mine. Water pumped from the dewatering well will be connected to the existing water management system and piped back (through the Cut-and-Cover Tunnel) to the Knocknacran Mine site and lagoons for eventual discharge to the River Bursk, as is the current water management system for the existing dewatering well.

The sensitivity is considered to be Medium, and the magnitude of impact is considered to be Negligible (Adverse). It is considered that the effect of this is Imperceptible.

Potential Effects: Operational Phase: Mine Development: Wastewater Infrastructure

Knocknacran West Open-Cast Mine site will use the wastewater treatment system constructed in the construction phase. Wastewater will first be treated at the site prior to being pumped to a surface percolation area. The treatment tank will be maintained and desludged ca. every 2 years by a licenced contractor. A site suitability assessment carried out by Hydrocare is included in Appendix 3.2.

The existing wastewater treatment system on the Knocknacran site will remain in use for operations on that site and no increase in capacity is required.

As the mine development will have an independent wastewater infrastructure, no impact is envisaged on the surrounding private septic tank system in the area.

The sensitivity is considered to be Negligible, and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effects are considered to be Imperceptible.

Potential Effects: Operational Phase: Mine Development: Surface Water Infrastructure

There is no existing surface water infrastructure on the proposed Knocknacran West Mine site except drainage ditches bounding and within the site and a stream in the east of the site (refer to Chapter 8.0, Water, for further details).

Stripping campaigns will be undertaken periodically at the Knocknacran West site, and by association, this stripped material will be placed within the Knocknacran and Knocknacran West sites during phased restoration. Stripping of material (overburden and interburden) has the potential to affect the existing surface water network in the area.

The mine development will continue to use the existing mine water management system located adjacent to the Knocknacran Plant Site (refer to Section 8.4.7 for details).

As discussed in Section 8.6.4.6 of the EIAR, emergency storage of water will be facilitated by storing it in the existing Knocknacran Open-Cast Mine as is currently the case. As the proposed Knocknacran West Open-Cast Mine is developed, it will provide capacity for emergency water storage replacing the capacity of the existing Knocknacran Open-Cast Mine as it is remediated.

In addition, a low-lying area within the footprint of the remediated Knocknacran Open-Cast Mine will be available to store further excess water should the need arise.

The sensitivity of the surface water network is considered to be Low, and the magnitude of impact is considered to be Negligible (Adverse). As such, the effect is deemed to be Imperceptible.

Potential Effects: Operational Phase: Mine Development: Local Waste Infrastructure

The proposed mining activities will maintain the existing levels of production and there is to be no intensification in operations, therefore the waste output will be maintained to the existing levels.

Overburden and interburden material that has been stripped (during specific stripping campaigns) will be used for the ongoing restoration of the Knocknacran Open-Cast Mine and subsequently for the Knocknacran West Open-Cast.

Inert materials comprising concrete, blockwork and rock fill that have been used to backfill crown holes and fissures during the remediation of the former Magheracloone GAA Grounds (as categorised in the Golder CQA Report, Appendix 3.1 of the EIAR) will be segregated and stockpiled for re-use as capping for site access roads and compound yards, as they become available during the stripping campaigns.

The sensitivity is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect is considered to be Imperceptible.

Potential Effects: Operational Phase: Mine Development: Surface Infrastructure

The open-cast at Knocknacran West has been designed with a minimum of 100 m setback from the cutline to a third party residence, blasting of the gypsum units will be of greater distances away. In this regard, there will be no potential impact on infrastructure in the surrounding area due to extraction activities.

The sensitivity is considered to be Medium and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect is considered to be Imperceptible.

Potential Effects: Operational Phase: Mine Development: Geological Asset

The mining project proposes the extraction of gypsum from the Knocknacran West Open-Cast Mine which is a geological resource and asset. As outlined in Chapter 7.0 (Land, Soils and Geology) the sensitivity is considered to be High and the predicted impact is considered to be Medium (Beneficial), therefore the significance of effect (i.e. mining the asset) is considered to be Large (Beneficial).

Potential Effects: Operational Phase: Mine Development: Land Resource

The operational phase of the Knocknacran West Open-Cast Mine enables the restoration of the existing open-cast at Knocknacran to near original ground levels. This would be a change from the existing restoration plan permitted under Reg. Ref. 17/217 which allows the site to be restored to both agricultural land and a lake. The restoration of the Knocknacran Mine is considered to be a Medium (Beneficial) impact on land which is considered to be Low sensitivity, therefore the effect is considered to be of Slight (Beneficial) significance.

The operational phase of the Knocknacran West Open-Cast Mine will result in the existing Low sensitivity land at the site being removed as part of the extraction activities. While the land will be lost during the operational life of the mine, concurrent phased restoration will also occur and the removal of the workings beneath the lands will have an overall Low (Beneficial) impact resulting in a Slight (Beneficial) significance.

Potential Effects: Operational Phase: Mine Development: Scenic Routes

The landscape surrounding the Site is characterised as ‘drumlin and undulating farmland’.

Chapter 13.0 (Landscape and Visual) demonstrates that the proposed mine development will not have any material effect on the prevailing landscape character or alter views of the mine from surrounding receptors.

The sensitivity of the scenic routes is considered to be Negligible, the magnitude of impact to be Negligible (adverse) and the effect of this during construction works is considered to be Imperceptible.

16.6.5 Potential Effects: Restoration/Closure Phase: Community Sports Complex

No closure phase is proposed for the Community Sports Complex, therefore the potential impact and effect from this phase is not considered further. It is scoped out for consideration in this phase.

16.6.6 Potential Effects: Restoration/Closure Phase: Mine Development

A Closure, Restoration and Aftercare Management Plan (CRAMP) (Appendix 3.3) has been prepared, which sets out the aftercare proposals following cessation of mine operations. The intention is to reuse infrastructural assets with an aim of attracting new businesses to the site. The utility infrastructure that will remain will be a benefit to future users of the Application Site.

Restoration/Closure Phase: Mine Development: Traffic and Transportation

During the final restoration phase, works will be similar to the operational phase stripping campaigns with all earthworks movements contained within the mine sites.

Contractors associated with removal of the mine infrastructure from the plant site (e.g. the crushers and conveyors) will utilise the existing mine entrance and surrounding road network.

As closure progresses into aftercare, contractors will periodically come to site for environmental monitoring or inspections which vary over time from monthly to annually.

Works associated with this phase would be significantly reduced compared to operational vehicle movements. Therefore, the potential effect is considered to be Imperceptible on traffic and transport.

Potential Effects: Restoration/Closure Phase: Mine Development: Fuel Resource Management

Given that there are existing storage facilities on the Knocknacran Mine site and that there will be no increased demand for storage onsite as restoration and closure represent a winding down of the mine development; the sensitivity of the site from a resource management perspective is considered to be Negligible.

The sensitivity is considered to be Low, the magnitude of impact is considered to be Negligible, and the significance of the effect is considered to be Imperceptible.

Potential Effects: Restoration/Closure Phase: Mine Development: ESB Network Utilities

During the restoration and closure phase, electricity will be required by plant and equipment dismantling the mine development, however, this will be temporary to short-term in nature and reduced compared to the operational phase. There is the potential that the non-mining infrastructure on the plant site will be retained (e.g. the office building) which would require that the ESB connection be maintained onsite, however, this would subject to a future planning application and regulation during the closure phase.

The sensitivity of the network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Overall, the potential effects of this on the electricity network are considered to be Imperceptible.

Potential Effects: Restoration/Closure Phase: Mine Development: Gas Supply

The final restoration of Knocknacran West Mine and Knocknacran Mine will not have an effect or impact on the gas supply network. There is the potential that the non-mining infrastructure on the plant site will be retained (e.g. the office building) which would require that the gas connection be maintained onsite, however, this would subject to a future planning application and regulation during the closure phase.

The sensitivity of the network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect of the Proposed Development on the GNI work is considered to be Imperceptible.

Potential Effects: Restoration/Closure Phase: Mine Development: Telecommunications Network

The final restoration of Knocknacran West Mine and Knocknacran Mine will not have an effect or impact on the telecommunication network. There is the potential that the non-mining infrastructure on the plant site will be retained (e.g. the office building) which would require that the connection be maintained onsite, however, this would subject to a future planning application and regulation during the closure phase.

The sensitivity of the network is considered to be Negligible, and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect of this on the telecommunications network is Imperceptible.

Potential Effects: Restoration/Closure Phase: Mine Development: Magheracloone Group Water Scheme

The final restoration of Knocknacran West Mine and Knocknacran Mine will not have an effect or impact on the telecommunication network. There is the potential that the non-mining infrastructure on the plant site will be retained (e.g. the office building) which would require that the connection be maintained onsite, however, this would subject to a future planning application and regulation during the closure phase. The connection on the Knocknacran West Mine site would no longer be required and would be disconnected.

The sensitivity of the existing network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). The effects on the MGWS are considered to be Imperceptible.

Potential Effects: Restoration/Closure Phase: Mine Development: Third Party Well Network

The dewatering borehole on the mine site will be decommissioned during this phase of the development, which will allow water levels to rebound to pre-mining levels. There is potential for sediment or pollutants to circulate during rewatering, however, the extraction process at Knocknacran does not include chemical processing and the likelihood of pollutants impacting surrounding wells, particularly in large or prolonged volumes, is considered to be very low. In addition, during the operational life, best practice and mitigation measures will have been implemented which will have reduced the likelihood of pollutant problems at the site.

The sensitivity of the existing network is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). The effects of the proposed mining activities on the MGWS are considered to be Imperceptible.

Potential Effects: Restoration/Closure Phase: Mine Development: Drumgoosat Dewatering Borehole

As part of this phase, and as discussed above in relation to the third party well network, the dewatering borehole will be decommissioned. Given this asset is longer to be used, there is no longer an impact or effect to measure on the asset in this phase.

Potential Effects: Restoration/Closure Phase: Mine Development: Wastewater Infrastructure

With the closure of the mine development, there will no longer be a requirement for a wastewater treatment system for the mine workers. During initial closure activities workers will require the facilities to use.

There is the potential that the non-mining infrastructure on the plant site will be retained (e.g. the office building) which would continue to use the Knocknacran wastewater treatment system onsite, however, this would subject to a future planning application and regulation during the closure phase.

The sensitivity is considered to be Negligible, and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effects are considered to be Imperceptible.

Potential Effects: Restoration/Closure Phase: Mine Development: Surface Water Infrastructure

During this phase, the open cast void on the Knocknacran West site will slowly fill with water and a permanent water body will develop (Piteau 2021, Appendix 8.7). The predicted final area of the water body is ca. 25 ha or about 15% of the current Corduff Stream catchment upstream of “SW Flow F” (Piteau 2022, Appendix 8.1).

The Corduff Stream will be reinstated with flows fed by the waterbody developed on the Knocknacran West site. The presence of the waterbody will increase the effective catchment of the Corduff Stream by ca. 11 ha, extending the Corduff catchment area to Lough Fea from ca. 169 ha to ca. 180 ha. The estimated annual average outflow from the waterbody is between 500-700 m^3/d, varying seasonally.

The long-term chemistry of the waterbody was simulated by Piteau (2021, Appendix 8.7) and the background hydrochemistry indicates that the discharge from the waterbody will have minimal impact to the existing stream water quality.

The sensitivity is considered to be Low, and the magnitude of impact is considered to be Low (Beneficial). As such, the effect is deemed to be Slight.

Potential Effects: Restoration/Closure Phase: Mine Development: Local Waste Infrastructure

This phase of the development is considered to be similar to the construction mine phase, although there will be fewer work areas as works will be confined to Knocknacran site and site office area in Knocknacran West.

The sensitivity is considered to be Low and the magnitude of impact is considered to be Negligible (Adverse). Therefore, the effect is considered to be Imperceptible.

Potential Effects: Restoration/Closure Phase: Mine Development: Surface Infrastructure

This phase will have no impact or effect on the surface infrastructure surrounding the site as open-cast extraction activities will have ceased at the site. It is scoped out of this assessment.

Potential Effects: Restoration/Closure Phase: Mine Development: Geological Asset

This phase will have no impact or effect on the geological resource in the area, as the resource has already been exploited in the area by this phase. This is scoped out of this assessment.

Potential Effects: Restoration/Closure Phase: Mine Development: Land Resource

The restoration plan for the Knocknacran West site will allow the creation of additional areas. Based on current planning, it will be possible to create open water habitat, shoreline / washland areas and open ground which will be used as grassland, woodland or agricultural fields.

The Knocknacran open-cast will be restored to grassland, which may be used for agricultural usage. The plant site at Knocknacran may be retained for future industrial usage, subject to a future planning permission being sought and granted.

Lands created through this phase of the mine development will have a Low sensitivity. While the land will be lost during the operational life of the mine, phased restoration will occur and the removal of the underground workings beneath the lands will have an overall Low (Beneficial) impact resulting in a Slight (Beneficial) significance.

Potential Effects: Restoration/Closure Phase: Mine Development: Scenic Routes

Given that the site is not proximal to scenic routes/views in the county or neighbouring counties, it is considered that the sensitivity of the scenic routes is considered to be Negligible, the magnitude of impact to be Negligible (adverse) and the effect of this during construction works is considered to be Imperceptible.

16.7 Mitigation and Management

Mitigation measures to be implemented during the proposed operations and subsequent restoration of the open-cast mines will involve minimising any impacts on surrounding sensitive receptors. Where relevant, mitigation measures will be included in the construction and operational life of the proposed Community Sports Complex.

16.7.1 Mitigation and Management: Construction Phase: Community Sports Complex

- Works will be undertaken in line with any conditions set by MCC;
- All works to the electrical power lines, gas network, water network and telecommunications network during the construction phase will be carried out in accordance with appropriate requirements and guidelines. Locations and capacity of the network services will be agreed in consultation with relevant service providers;
- Screening will be put in place as part of the proposed Community Sports Complex to assimilate the developments into the landscape;
- Signage will be maintained and erected within the Site in order to maintain a safe and orderly traffic regime on the Site;
- Pre-construction consultation and authorisation will be achieved for all of the relevant infrastructure connections;

- All works will be undertaken in accordance with best practice and adhere to the following guidelines:
  - Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
  - CIRIA (2009). Control of Water Pollution from Construction Sites – Guidance for Consultants and Contactors (C532).
  - NRA Guidelines (2006). NRA Guidelines for the Crossing of Watercourses during the Construction of National Road Scheme.
  - Defra (Department for Environment, Food and Rural Affairs) (2009). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites;
- Any works required to Material Assets on or around the Site will be carried out in conjunction with the relevant provider to ensure minimal disruption to the existing users;
- Any works required to Material Assets on or around the Site will be carried out strictly in accordance with the relevant provider's Code of Practices;
- The appointed Main Contractor will be required to produce a final Construction Management Plan (CMP), which will document appropriate procedures and responsible persons when working on and around utilities and services infrastructure within and around the site;
- Efficiencies in water usage should be considered throughout the engineering design and construction phase of the development;
- Any plant will be regularly maintained and kept in good order on the proposed Community Sports Complex site; and
- Refuelling of mobile plant will take place from bunded fuel tanks.

16.7.2 Mitigation and Management: Construction Phase: Mine Development

- Works will be undertaken in line with any conditions set by MCC;
- All works to the electrical power lines, gas network, water network and telecommunications network during the construction phase will be carried out in accordance with appropriate requirements and guidelines. Locations and capacity of the network services will be agreed in consultation with relevant service providers;
- Screening will be put in place as part of the mine development to assimilate the developments into the landscape. In the case of Knocknacran West Mine this will also provide mitigation for dust, noise, vibration and human health until final restoration is completed (as set out in the proposed Mine Closure Plan, see Appendix 3.3 of this EIAR);
- Signage will be maintained and erected within the development areas in order to maintain a safe and orderly traffic regime on the Site;
- Pre-construction consultation and authorisation will be achieved for all of the relevant infrastructure connections;

- Earthworks will follow the embedded mitigation measures outlined in 16.6.2 above. All works will be undertaken in accordance with best practice and adhere to the following guidelines:
  - Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
  - CIRIA (2009). Control of Water Pollution from Construction Sites – Guidance for Consultants and Contactors (C532).
  - NRA Guidelines (2006). NRA Guidelines for the Crossing of Watercourses during the Construction of National Road Scheme.
  - Defra (Department for Environment, Food and Rural Affairs) (2009). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.
- Waste management will follow the embedded mitigation measures outlined in 16.6.2 above;
- Any works required to Material Assets on or around the Site will be carried out in conjunction with the relevant provider to ensure minimal disruption to the existing users;
- Any works required to Material Assets on or around the Site will be carried out strictly in accordance with the relevant provider's Code of Practices;
- The appointed Main Contractor will be required to produce a final Construction Management Plan (CMP), which will document appropriate procedures and responsible persons when working on and around utilities and services infrastructure within and around the Site;
- Efficiencies in water usage should be considered throughout the engineering design and construction phase of the development;
- Any processing plant and / or mobile plant on the mine sites will be regularly maintained and kept in good working order; and
- Refuelling of mobile plant will take place from bunded fuel thanks as required.

16.7.3 Mitigation and Management: Operational Phase: Community Sports Complex

- Works will be undertaken in line with any conditions set by MCC;
- Any works required to Material Assets on or around the Site will be carried out in conjunction with the relevant provider to ensure minimal disruption to the existing users;
- Any works required to Material Assets on or around the Site will be carried out strictly in accordance with the relevant provider's Code of Practices;
- Any plant will be regularly maintained and kept in good order on the proposed Community Sports Complex site; and
- Refuelling of mobile plant will take place from bunded fuel thanks.

16.7.4 Mitigation and Management: Operational Phase: Mine Development

16.7.4.1 Embedded Mitigation: Operational Phase: Mine Development

The initial assessment of the significance of potential effects resulting from the Mine Development takes into consideration any embedded design and commonly undertaken good practice mitigation. The elements of the Mine Development design and good working practices that reduce the potential for include the following:

Maintenance works for the existing settlement lagoons on the Knocknacran Mine site are carried out periodically by a subcontractor and the programme of works is as follows:

- A CAT scanner is used to scan the ground for underground services in conjunction and any underground services identified are marked up on the ground and recorded on permit issued to excavator drivers;
- Activities require two excavators at the excavation area and an excavator at the deposition area. Two dump trucks are used for the haulage of material removed from the lagoons to the open-cast area;
- All handrails (and pumps where required) are removed prior to the works;
- The lagoons are dewatered individually prior to cleaning;
- Mine water is diverted to other lagoons which are not yet cleaned (or to the open-cast) and therefore have not yet been drained;
- An excavator is positioned on the roads between ponds. A linear strip is excavated along the length of the lagoon and material is loaded onto a dump truck for removal to the open-cast;
- An excavator enters the lagoons when the linear strip is cleaned back to allow safe entry to the pond to clean the interior;
- The excavator will side cast the remaining material for removal from the lagoons;
- As lagoon 3 is dewatered, the top half of the water column is diverted to lagoons 1 and 2 while the bottom half is diverted to the open-cast. This is carried out to minimise suspended solid concentrations in the newly cleaned lagoons, and while they are still refilling;
- After each lagoon is cleaned, mine water is gradually allowed to refill the lagoon, so as to minimise turbulence and suspended solid generation from the lagoon floor;
- Should there be a period of heavy rainfall during the lagoon cleaning, or refilling period, the pump at the open-cast sump is turned off so mine water is no longer diverted to the lagoons and water is left to settle in the open-cast sump first;
- Monitoring of the clearness of the water in both the lagoons and sump is carried out continuously. A monitoring sample is taken from MSE-1 to confirm suspended solid content and the water management system is then allowed to resume as normal after cleaning; and

- Table 16.8 below, provides the details of the maintenance plan for wastewater treatment systems on the mine site.

Table 16.8: Mine site maintenance plan

Wastewater treatment (Foul system)			
Item	**Inspections**	**Frequency of Inspection**	**Who**
Shredding pumps/ sump	As per OEM instruction	6 monthly	Waste Water Solutions Direct Ltd, Co Cork
Cycle/ storage tank/ sump	As per OEM instruction	6 monthly	Waste Water Solutions Direct Ltd, Co Cork
Percolation pump	As per OEM instruction	6 monthly	Waste Water Solutions Direct Ltd, Co Cork
Percolation area	As per OEM instruction	6 monthly	Waste Water Solutions Direct Ltd, Co Cork
Electrical Panel	As per OEM instruction	6 monthly	Waste Water Solutions Direct Ltd, Co Cork
Note: Service level Agreement reviewed every 12 months			
Mine Water Management Maintenance Plan			
Items	**Inspections**	**Frequency of Inspection**	**Who**
Drumgoosat Pump/ pipe system	Pump operational/ flow/ Power to electrical panel	4 per week as per pump check	SGMI
Open Cast Pump/ pipe system	Pump operational/ flow/ Power to electrical panel	4 per week as per pump check	SGMI
Drummond Mine Pumps/ pipe system	Pump operational/ flow/ Power to electrical panel	4 per week as per pump check	SGMI
Lagoon Pumps/ Pipe system (x3)	Pump operational/ Power to electrical panel	Operation alarm system/ Automatic rotation/ visual 2 per week	SGMI
Lagoon Sumps (x4)	Check water/silt level	4 per week (visual) - water level on Scada system	SGMI

Holding Tanks/ MSE-1	Check water level/ silt level/ flow	1 per week min. (visual) - monitored continuously Scada system	SGMI
Outfall to Bursk	Check water level/ flow	1 per week min. (visual) - monitored continuously Scada system	SGMI
Mine Site drainage/ pipe reticulation	Integrity of pipes	Every 3 years	Subcontracted - SGMI

16.7.4.2 Additional Mitigation: Operational Phase: Mine Development

Embedded mitigation has already been outlined in Section 16.7.4.1, the following additional mitigation will be implemented onsite:

- Works will be undertaken in line with any conditions set by the IE licence;
- Any works required to Material Assets on or around the Site will be carried out in conjunction with the relevant provider to ensure minimal disruption to the existing users;
- Any works required to Material Assets on or around the Site will be carried out strictly in accordance with the relevant provider's Code of Practices;
- The stripping of the site will be undertaken at specific times and last for defined periods of time (typically < 6 months) over the life of the proposed development. The stripping earthworks will be undertaken by a specialist contractor following a tender process.
- The designed intercept drainage system(s) and settling pond/filter system, for each stripping campaign, will be installed prior to stripping of material. The design will be updated throughout the stripping campaigns as the works progress. The design will be agreed with the relevant authorities prior to stripping.
- The contractor will organize the earthworks operations, whether in excavation or in restoration, so that all water shed onto the earthworks, or which enters the earthworks from any source is rapidly led away into a specifically designed intercept drainage system(s) and settling pond / filter system prior to discharge into the underlying mine workings, where it will enter the existing mine water management and treatment system.
- As the earthworks progress, the contractor will construct, maintain and revise, as necessary, all temporary ditches, sumps, pump lines and pumping units required for the effective disposal of all such water flows.
- The contractor will not commence main earthworks operations or continue with a section of main earthworks operations until a plan and programme of ditches, sumps, pump lines and pumping units has been agreed with SGMI's project manager.
- Depending on the area(s) to be stripped and restored, the contractor will construct a temporary de-silting settling pond / system at approximate location(s) to be agreed with SGMI's project manager prior to any stripping taking place.
- The contractor will construct surface water cut-off drains, ditches, swales and sumps, as required to ensure that the works are maintained free from standing water and to divert surface water and groundwater gathered to the drainage system via gravity and/or pumping. The cut-off drains will be a minimum of 600 mm deep and 400 mm wide at the base, and will have side slopes of no steeper than 1(V):2(H).
- The contractor's working surfaces in excavation and in filling will be sufficiently regular and will have such cross falls or longitudinal falls or both as are necessary to prevent standing water and to rapidly dispose of water run-off. The contractor's earthworks slopes, whether

in cutting or in filling, will be trimmed to regular profile and compacted so as to prevent ponding water and to rapidly dispose of water run-off without scour.

- The contractor's temporary ditches and sumps will be located such that when backfilled they shall not have any adverse effects on the strengths or stability of the completed works. When temporary ditches and sumps are no longer required in a particular area of the site by reason of progress of the work, the contractor will promptly remove all temporary pump pipelines and pumping units. All softened deposits will be removed from the ditches and these areas backfilled with suitable material. Filling, compaction and field quality control will be as specified for the adjacent earthworks operations.

- The contractor's temporary sumps, pumping units and fuel or power supply will have adequate capacities for the pumping loads and will be maintained regularly to ensure efficient and reliable operation. The contractor will provide adequate supervision to ensure continuous operation whenever this is required to ensure rapid disposal of water run-off and will have adequate standby arrangements available to cope with pump or power failures.

- To avoid siltation of watercourses from crossing point locations, silt traps will be placed beside temporary crossing points with an associated buffer strip. The silt-traps will be maintained and cleaned regularly during the course of the works.

- A maintenance schedule and operational procedure will be established by the contractor for silt and pollution control measures during the construction period. This will be undertaken in consultation with the relevant statutory authorities.

- Any processing plant and / or mobile plant on the mine sites will be regularly maintained and kept in good working order;

- Earthworks will follow the embedded mitigation and design measures outlined in Section 16.6.4 above. All works will be undertaken in accordance with best practice and adhere to the following guidelines:

    - Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
    - CIRIA (2009). Control of Water Pollution from Construction Sites – Guidance for Consultants and Contactors (C532).
    - NRA Guidelines (2006). NRA Guidelines for the Crossing of Watercourses during the Construction of National Road Scheme.
    - Defra (Department for Environment, Food and Rural Affairs) (2009). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites;

- Waste Management will follow the embedded mitigation and design measures outlined in 16.6.4 above;

- Non-marketable materials will be utilised in phased restoration activities on the mine sites; and

- The qualified mine manager will ensure compliance with relevant safety and statutory legislation and best practices as set out in the HSA's 'Guidelines to the Safety, Health and

Welfare at Work (Quarries) Regulations 2008', and other relevant statutory and industry guidelines from Government Departments and the EPA for the mine sites.

16.7.5 Mitigation and Management: Restoration/Closure Phase: Community Sports Complex

There is not proposed decommissioning of the Community Sports Complex and so this is not considered further here.

16.7.6 Mitigation and Management: Restoration/Closure Phase: Mine Development

- Works will be undertaken in line with any conditions set by the IE licence and CRAMP;
- Any works required to Material Assets on or around the Site will be carried out in conjunction with the relevant provider to ensure minimal disruption to the existing users;
- Any works required to Material Assets on or around the Site will be carried out strictly in accordance with the relevant provider's Code of Practices;
- Any processing plant and / or mobile plant on the mine sites will be regularly maintained and kept in good working order;
- Earthworks will follow the embedded mitigation measures and design outlined in 16.6.2 above. All works will be undertaken in accordance with best practice and adhere to the following guidelines:
    - Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
    - CIRIA (2009). Control of Water Pollution from Construction Sites – Guidance for Consultants and Contactors (C532).
    - NRA Guidelines (2006). NRA Guidelines for the Crossing of Watercourses during the Construction of National Road Scheme.
    - Defra (Department for Environment, Food and Rural Affairs) (2009). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites;
- Waste Management will follow the embedded mitigation measures and design outlined in 16.6.2 above; and
- The qualified mine manager will ensure compliance with relevant safety and statutory legislation and best practices as set out in the HSA's 'Guidelines to the Safety, Health and Welfare at Work (Quarries) Regulations 2008', and other relevant statutory and industry guidelines from Government Departments and the EPA for the mine sites.

16.8 Monitoring

16.8.1 Monitoring: Construction Phase: Community Sports Complex

- Monitoring will be undertaken in line with any conditions set by MCC;

- The appointed Main Contractor will be required to produce a final Construction Management Plan (CMP), which will document appropriate procedures and responsible persons when working on and around utilities and services infrastructure within and around the site; and

- Any monitoring associated with authorisation or consents (e.g., construction discharges or those associated with operational activities) will be incorporated into the Main Contractor's CMP and will be adhered to.

16.8.2 Monitoring: Construction Phase: Mine Development

- Monitoring will be undertaken in line with any conditions set by MCC;

- The appointed Main Contractor will be required to produce a final CMP, which will document appropriate procedures and responsible persons when working on and around utilities and services infrastructure within and around the site;

- Any monitoring associated with authorisation or consents (e.g., construction discharges or those associated with operational activities) will be incorporated into the Main Contractor's CMP and will be adhered to;

- Prior to commencement on site the Main Contractor(s) will update the RWMP with the authorized waste contractors' details for each waste type (name, permit numbers, authorized waste sites etc.). Waste handling and all documentation will be monitored in accordance with the procedures outlined.

- The Site Manager will maintain a copy of all waste collection permits. A waste docket must be issued to the collector. If being transported to another site, a copy of the waste permit or EPA Waste License for that site must be provided to SGMI (as the dispatcher of waste) and also copied to the Main Contractor.

- As well as a waste collection docket, a receipt from the destination of the material will be kept as part of the on- site waste management records. All information will be entered in a waste management system to be maintained on-site.

Future monitoring of the Proposed Development in relation to the material assets has been recommended where relevant in this EIAR; Water (Chapter 7.0), Air Quality (Chapter 10.0), Noise (Chapter 11.0) and Mitigation and Monitoring (Chapter 19.0).

16.8.3 Monitoring: Operational Phase: Community Sports Complex

There is no proposed environmental monitoring of the Community Sports Complex and so this is not considered further here.

16.8.4 Monitoring: Operational Phase: Mine Development

- Monitoring will be undertaken in line with any conditions set by the IE Licence; and

- Future monitoring of the Proposed Development in relation to the material assets has been recommended where relevant in this EIAR; Water (Chapter 7.0), Air Quality (Chapter 10.0), Noise (Chapter 11.0) and Mitigation and Monitoring (Chapter 19.0).

16.8.5 Monitoring: Restoration/Closure Phase: Community Sports Complex

There is no proposed decommissioning of the Community Sports Complex and so this is not considered further here.

16.8.6 Monitoring: Restoration/Closure Phase: Mine Development

- Monitoring will be undertaken in line with any conditions set by the IE Licence;
- The appointed Main Contractor will be required to produce a final CMP, which will document appropriate procedures and responsible persons when working on and around utilities and services infrastructure within and around the site;
- Any monitoring associated with authorisation or consents (e.g., construction/decommissioning discharges) will be incorporated into the Main Contractor's CMP and will be adhered to;
- Prior to commencement on site the Main Contractor(s) will update the RWMP with the authorized waste contractors' details for each waste type (name, permit numbers, authorized waste sites etc.). Waste handling and all documentation will be monitored in accordance with the procedures outlined.
- The Site Manager will maintain a copy of all waste collection permits. A waste docket must be issued to the collector. If being transported to another site, a copy of the waste permit or EPA Waste License for that site must be provided to SGMI (as the dispatcher of waste) and also copied to the Main Contractor.
- As well as a waste collection docket, a receipt from the destination of the material will be kept as part of the on- site waste management records. All information will be entered in a waste management system to be maintained on-site.

Future monitoring of the Proposed Development in relation to the material assets has been recommended where relevant in this EIAR; Water (Chapter 7.0), Air Quality (Chapter 10.0), Noise (Chapter 11.0) and Mitigation and Monitoring (Chapter 19.0).

16.9 Residual Effects

16.9.1 Community Sports Complex

Once the identified mitigation measures, appropriate design standards and operational infrastructure management plans are adhered to, it is considered that any effects on the Material Assets surrounding the proposed Community Sports Complex will be Not Significant.

16.9.2 Mine Development

Once the identified mitigation measures, appropriate design standards and operational infrastructure management plans are adhered to, it is considered that any effects on the Material Assets surrounding the proposed Mine Development will be Not Significant.

16.10 Cumulative Effects

16.10.1 The Project – Community Sports Complex and Mine Development

The construction phases of the Community Sports Complex and the mine development occur simultaneously, however, no significant effects are identified for either and it is considered that there is no potential for cumulative effects on material assets between the two developments.

The construction phase of the Community Sports Complex overlaps with the first year of the operational life of the mine development, however, no significant effects are identified for either and it is considered that there is no potential for cumulative effects on material assets between the two developments.

The operational phase of the Community Sports Complex and mine development overlap, however, no significant effects are identified for either and it is considered that there is no potential for cumulative effects on material assets between the two developments.

The restoration phase of the mine development overlaps with the operational phase of the Community Sports Complex, however, no significant effects are identified for either and it is considered that there is no potential for cumulative effects on material assets between the two developments.

16.10.2 The Project and Other Offsite Projects

Given that the Project will not have a significant effect and that no cumulative effects are foreseen on material asset due to both the Community Sports Complex and the mine development, it is considered that there is no potential for cumulative effects with other offsite projects. In relation to Drummond Mine, while it is adjacent to the Project site, it is already considered within the resource uses on the Knocknacran site presented here.

16.11 Do-Nothing Scenario

In the event of a Do-Nothing Scenario, whereby the Proposed Development did not go ahead, there would be no significant effect. However, the opportunity to further develop the Community Sports Complex would be lost and the geological asset (gypsum) which is Ireland's only indigenous supply of gypsum to the construction industry would be left in-situ.

16.12 Difficulties Encountered

There were no particular difficulties encountered during the production of the Material Assets chapter of the EIAR.

16.13 References

- Department of the Environment, Climate & Communications (2021) 'Draft Policy Statement on Mineral Exploration and Mining in Ireland'. Available at: https://www.gov.ie/en/consultation/94c4e-consultation-on-the-draft-policy-statement-on-mineral-exploration-and-mining-in-ireland-and-associated-sea-environmental-report-and-aa-natura-impact-statement/ (Accessed: 2nd February 2023).

- Environmental Protection Agency (1999) 'Waste Water Treatment Manual Treatment Systems for Small Communities, Business, Leisure Centres and Hotels'. Available at: https://www.epa.ie/publications/compliance--enforcement/waste-water/waste-water-treatment-manual-.php (Accessed: 2nd February 2023).

- Environmental Protection Agency (2015) 'Advice Notes for Preparing Environmental Impact Statement - Draft'.

- Environmental Protection Agency (2022) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports'. Available at: https://www.epa.ie/publications/monitoring--assessment/assessment/EPA_EIAR_Guidelines.pdf (Accessed: 2nd February 2023).

- Environmental Protection Agency (2021) 'EPA Code of Practice - Domestic Waste Water Treatment Systems (Population Equivalent ≤ 10)'. Available at: https://www.epa.ie/publications/compliance--enforcement/waste-water/2021_CodeofPractice_Web.pdf (Accessed: 2nd February 2023).

- European Council (1997) 'Council Directive 97/11/EC amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment'. Publications Office of the European Union. Available at: http://op.europa.eu/en/publication-detail/-/publication/d0772bfd-51a4-4437-a5f2-752f46212a58/language-en (Accessed: 2nd February 2023).

- European Council (2003) 'Directive 2003/4/EC of the European Parliament and of the Council on public access to environmental information and repealing Council Directive 90/313/EEC'. Available at: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:041:0026:0032:EN:PDF (Accessed: 2nd February 2023).

- European Council (2009) Directive 2009/31/EC of the European Parliament and of the Council on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006, 140. Available at: http://data.europa.eu/eli/dir/2009/31/oj/eng (Accessed: 2nd February 2023).

- European Union (1985) 'Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment'. OPOCE. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:31985L0337&from=EN (Accessed: 2nd February 2023).

- European Union (2011) 'Directive 2011/92/EU of the European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment'. Official Journal of the European Union. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011L0092&from=EN (Accessed: 2nd February 2023).

- European Union (2014) 'Directive 2014/52/EU of the European Parliament and of the Council, amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment'. Official Journal of the European Union. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0052&from=EN (Accessed: 2nd February 2023

- Health and Safety Authority (2020) Safe Quarry - Guidelines to the Safety, Health and Welfare at Work (Quarry) Regulations 2008. Available at: https://www.hsa.ie/eng/publications_and_forms/publications/mines_and_quarries/safe_quarry_regs_2020.pdf (Accessed: 2nd February 2023).

- Irish Statute Book (2000) 'Planning and Development Act'. Office of the Attorney General. Available at: http://www.irishstatutebook.ie/eli/2000/act/30/enacted/en/html (Accessed: 2nd February 2023).

- Irish Statute Book (2001) 'S.I. No. 600/2001 - Planning and Development Regulations'. Office of the Attorney General. Available at: http://www.irishstatutebook.ie/eli/2001/si/600/made/en/print (Accessed: 2nd February 2023).

- Irish Statute Book (2018) 'S.I. No. 296 of 2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations'. Office of the Attorney General. Available at: http://www.irishstatutebook.ie/eli/2018/si/296/made/en/print (Accessed: 2nd February 2023).

- Monaghan County Council and ERM (2008) 'County Monaghan Landscape Character Assessment'. Available at: https://monaghan.ie/planning/landscape-character-assessment/ (Accessed: 2nd February 2023).

- Monaghan County Council (2019) 'Monaghan County Development Plan 2019 - 2025'. Available at: https://monaghan.ie/planning/wp-content/uploads/sites/4/2019/04/Monaghan-County-Development-Plan-2019-2025-%E2%80%93-Written-Statement.pdf (Accessed: 2nd February 2023).

- Cavan County Council (2022) 'Cavan County Development Plan 2022 - 2028'. Available at: https://www.cavancoco.ie/services/planning-building/forward-planning/cavan-county-development-plan-incorporating-a-local-area-plan-for-cavan-town-2022-2028/ (Accessed: 2nd February 2023).

- Meath County Council (2021) 'Meath County Development Plan 2021 - 2027'. Available at: https://consult.meath.ie/en/consultation/meath-adopted-county-development-plan(Accessed: 2nd February 2023).

APPENDIX 16.1

ESB Service Routes original maps

APPENDIX 16.2

GNI Service Routes original maps

APPENDIX 16.3

Application to connect to the MGWS

Magheracloone Group Water Scheme

Greaghlone,

Carrickmacross,

Co. Monaghan

14/10/2021

Dear Sir/Madam,

Saint-Gobain Mining (Ireland) Limited will be lodging a planning application shortly for the Knocknacran West Project. This project proposes to establish an open-cast mine at the Knocknacran Open-Cast West site in County Monaghan. As part of the project, a site office/canteen and welfare facilities would be located onsite for staff. These buildings would be located to the north of the R179 as shown on the attached map (approximate ING coordinates 280774 299890).

Please find attached a copy of the MGWS application form which includes further details of the request for a new connection at the project site to supply water to the proposed office/canteen and welfare facilities. As the proposed facilities will form part of a planning application, the connection itself would be required subsequent to a grant of planning permission. Payment of the €1,000 application fee will be made by electronic transfer. Should there be any queries, please don't hesitate to contact the undersigned.

Yours sincerely,

Benson Plunkett

Mine Manager

Registered Office
Greaghlone,
Carrickmacross
Co Monaghan.
0429667812
admin@mgws.ie

I wish to apply to the committee of the above scheme for a water connection. The connection fees are **€3500(A) €1400(B). €1000 payable** on application. Balance of payment due before connection.
Payment does not guarantee a connection on the scheme. All applications are subject to assessment.

Any unsuccessful applications will receive a full refund.

Please include co-ordinates or a site map. INCLUDED

Bank Details:

If accepted, I agree to become a member of the Co - op Society and agree to the rules of same.

Signature x _____

Registered Office
Greaghlone,
Carrickmacross
Co Monaghan.
0429667812
admin@mgws.ie

Date: 15·10·21.

Application Form

Name: (Block Caps) BENSON PLUNKETT

Address: DRUMMOND MINE
CARRICKMACROSS
CO. MONAGHAN.

Eircode Address: ____ ____
(For connection)
Contact number: (mobile) ____

Email address: ____

Company Registration number: 11815.

Note: See attached map for connection address.

Type of connection required (tick)

H/O ☐ House only (A) **H/L** ☐ House & land (B) **Agri/only** ☐ Agriculture **Commercial** ☒

N

RECEIVED: 11/04/2023

Towards Carrickmacross

Proposed location of the welfare and office facilities on the Knocknacran West site

ING Coordinates 280774 299890

Towards Kingscourt

0 50 100 Metres

Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Important Safety Notice: Damage to gas pipelines can result in serious injury or death. Gas network information is provided as a general guide. The exact location and depth of medium or low pressure distribution gas pipes must be verified on site by carrying out necessary investigations, including, for example, hand digging trial holes along the route of the pipe. Service pipes are not generally shown but their presence should always be anticipated.

High pressure transmission pipelines are shown in red. If a transmission pipeline is identified within 10m of any intended excavations then work must not proceed before GNI has been consulted. The true location and depth of a transmission pipeline must be verified on site by a representative of GNI. Contact can be made through 1800 427 747.

All work in the vicinity of the gas network must be completed in accordance with the current edition of the Health and Safety Authority publication, 'Code of Practice For Avoiding Danger From Underground Services' which is available from the Health and Safety Authority (0818 289 389) or can be downloaded at www.hsa.ie.

Legal Notice: Gas Networks Ireland (GNI) and its affiliates, accept no responsibility for the accuracy of any information contained in this document including data concerning location and technical designation of the gas distribution and transmission network (the"Information"). The Information should not be relied on for accurate distance or depth of cover measurements.

Any representations and warranties, express or implied, are excluded to the fullest extent permitted by law. No liability shall be accepted for any loss or damage including, without limitation,direct, indirect or consequential loss arising out of or in connection with the use or re-use of the Information.

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- Aurora Telecom Sub Duct
- Aurora Telecom Inserted Gas Pipe

Aurora TELECOM

Aurora Telecom Queries - 01-8926106 (Office Hours)
Aurora_Network_Queries@gasnetworks.ie
Aurora Telecom Emergency Only 1800 427399 / 01 2030120

- Transmission Pipe (High Pressure)
- Transmission Pipe (Construction Issue)
- Distribution Pipe (Medium Pressure)
- Distribution Pipe (Low Pressure)
- Service Pipe (Medium Pressure)
- Service Pipe (Low Pressure)
- Strategic Pipe (Medium Pressure)
- Strategic Pipe (Low Pressure)
- Inserted
- Abandoned Pipe

C=?	Cover (depth in metres)		Pressure Monitor
CP	CP Test Point		Protection (Slabbing)
	End Cap		Protection (Sleeve)
	Hot Tap		Reducer
	Installation		Service Terminator
	Valve		Tee
	Mains Verification**		Transition

** Please contact GNI on 1800-427747 for specific information

DIAL BEFORE YOU DIG 1800 42 77 47
In Emergency call 1800 20 50 50 Gas Networks Ireland

Gas Networks Ireland

GAS NETWORK INFORMATION

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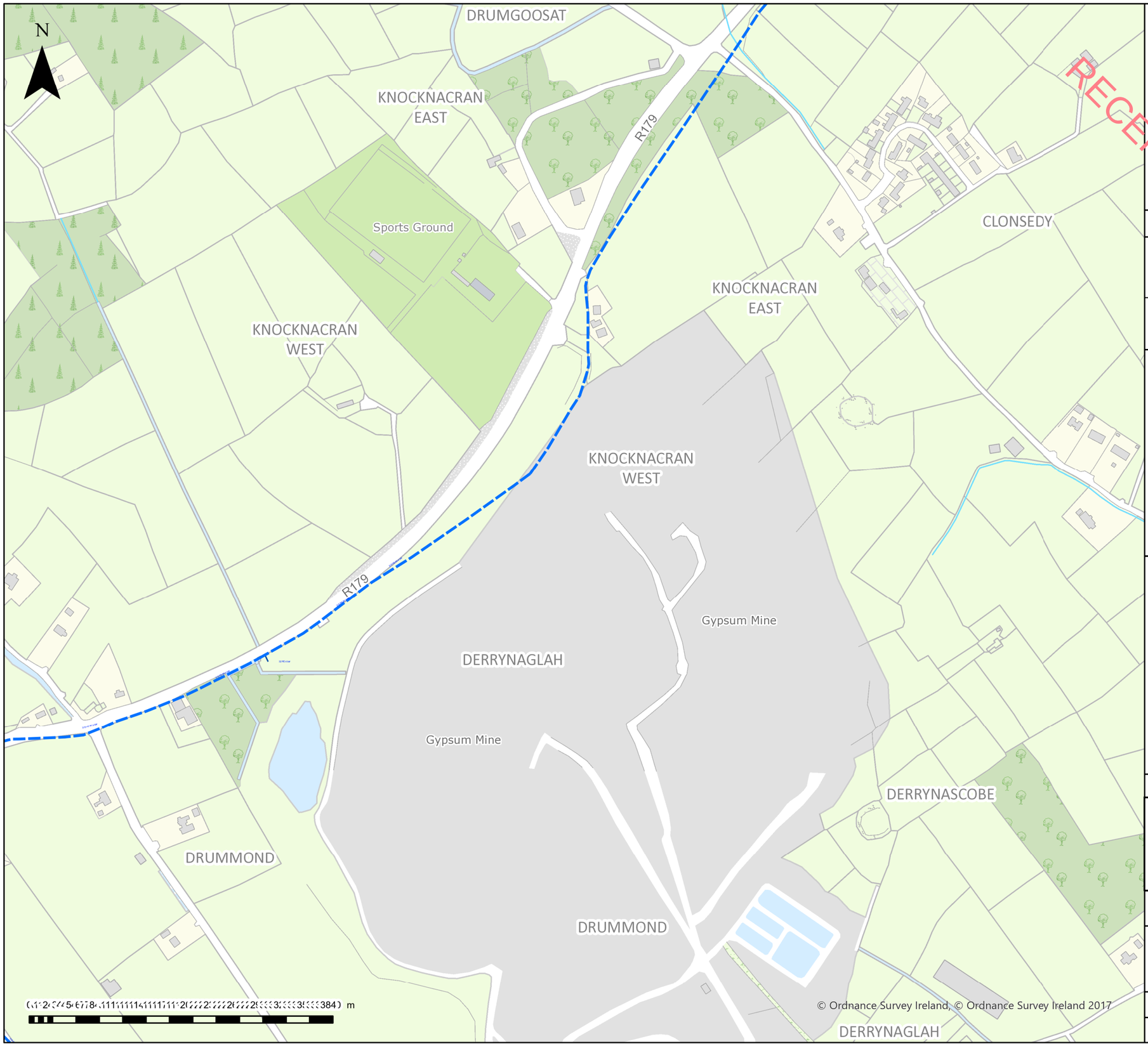

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- Transmission Pipe (Construction Issue)
- Distribution Pipe (Medium Pressure)
- Distribution Pipe (Low Pressure)
- Service Pipe (Medium Pressure)
- Service Pipe (Low Pressure)
- Strategic Pipe (Medium Pressure)
- Strategic Pipe (Low Pressure)
- Inserted
- Abandoned Pipe

C=?	Cover (depth in metres)		Pressure Monitor
CP	CP Test Point		Protection (Slabbing)
	End Cap		Protection (Sleeve)
	Hot Tap		Reducer
	Installation		Service Terminator
	Valve		Tee
	Mains Verification**		Transition

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In Emergency call 1800 20 50 50 Gas Networks Ireland

Gas Networks Ireland

GAS NETWORK INFORMATION

Description: KW1

Location: 680918,799829

Plot Date: 27/01/2023 17:01	Scale: 5000 @ A3
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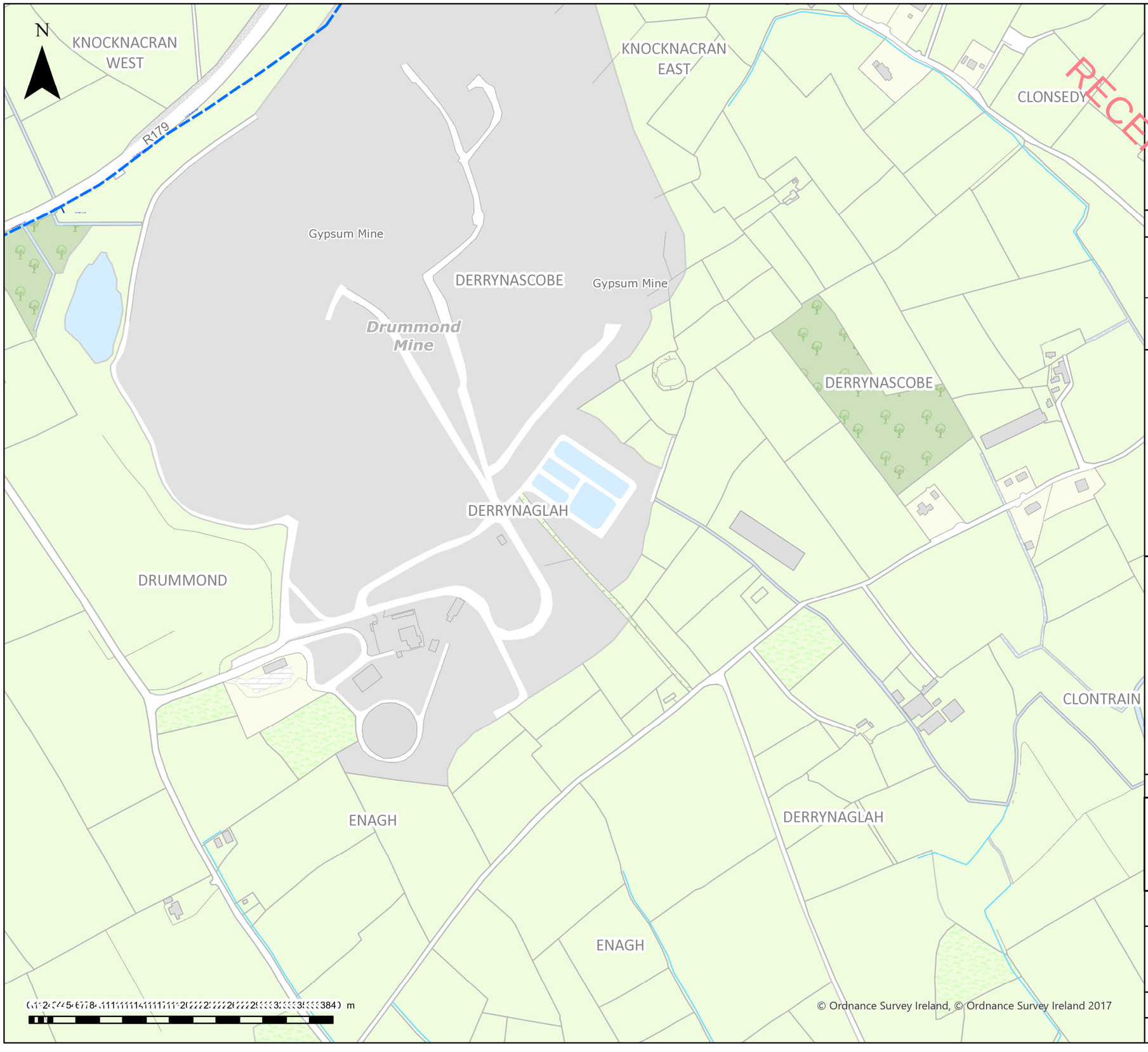

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High pressure transmission pipelines are shown in red. If a transmission pipeline is identified within 10m of any intended excavations then work must not proceed before GNI has been consulted. The true location and depth of a transmission pipeline must be verified on site by a representative of GNI. Contact can be made through 1800 427 747.

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- Distribution Pipe (Low Pressure)
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- Service Pipe (Low Pressure)
- Strategic Pipe (Medium Pressure)
- Strategic Pipe (Low Pressure)
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C=?	Cover (depth in metres)		Pressure Monitor
CP	CP Test Point		Protection (Slabbing)
	End Cap		Protection (Sleeve)
	Hot Tap		Reducer
	Installation		Service Terminator
	Valve		Tee
	Mains Verification**		Transition

** Please contact GNI on 1800-427747 for specific information

DIAL BEFORE YOU DIG 1800 42 77 47
In Emergency call 1800 20 50 50 Gas Networks Ireland

Gas Networks Ireland

GAS NETWORK INFORMATION

Description: KW3

Location: 681180,799253

Plot Date: 27/01/2023 17:04	Scale: 5000 @ A3
Plotted By: 5624	Ref ID: *5624_27012023170413*

ESB Networks

TITLE: 20230228-035_A3

COLOUR CODE:

- BLACK - 38KV & HIGHER VOLTAGE OVERHEAD LINES
- GREEN - MV(10KV/20KV) OVERHEAD LINES
- BLUE - LV (400V/230V) OVERHEAD LINES
- CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
- RED - MV/LV (10KV/20KV/400V/230V) UNDERGROUND CABLE ROUTES

DATE: 28-Feb-2023

** SCALE: 1:9592

** SCALE WHEN PRINTED ON AN A3 PAGE
XY COORDINATES DISPLAYED IN IRISH GRID COORDINATE SYSTEM

WARNING

THIS MAP INDICATES THE APPROXIMATE LOCATION OF ESB TRANSMISSION (400KV, 220KV, 110KV, 38KV) AND DISTRIBUTION (20KV, 10KV, 230V/400V) UNDERGROUND CABLES AND OVERHEAD LINES IN THE GENERAL AREA OF THE PROPOSED WORKS. ESB NETWORKS TAKES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE MAP. IT IS THE USER'S RESPONSIBILITY TO INDEPENDENTLY VERIFY THE INFORMATION AND THE LOCATION OF UNDERGROUND CABLES AND OVERHEAD LINES. LOW VOLTAGE (230V/400V) SERVICE CABLES (E.G. HOUSE SERVICES, FACTORY/SHOP SERVICES, PUBLIC LIGHTING LAMP SERVICES, ETC) ARE NOT INCLUDED BUT THEIR PRESENCE SHOULD BE ANTICIPATED. THE DEPTHS OF UNDERGROUND CABLES MUST NEVER BE ASSUMED. ADDITIONAL MORE DETAILED INFORMATION IS AVAILABLE FOR HIGH VOLTAGE TRANSMISSION UNDERGROUND CABLES (38KV, 110KV, 220KV, 400KV) FROM THE LOCAL ESB NETWORKS TRANSMISSION REPRESENTATIVE - SEE ATTACHED LIST FOR CONTACT DETAILS OR CALL 1800 372 757. NO WORK SHOULD BE CARRIED OUT IN THE VICINITY OF 38KV OR HIGHER VOLTAGE UNDERGROUND CABLES WITHOUT PRIOR CONSULTATION WITH ESB NETWORKS. BEFORE ANY MECHANICAL EXCAVATION IS UNDERTAKEN, THE ACTUAL LOCATION OF ALL UNDERGROUND ELECTRICITY CABLES MUST BE ESTABLISHED AND VERIFIED ON THE SITE USING: (A) UP-TO-DATE MAP RECORDS; (B) CABLE LOCATER EQUIPMENT OPERATED IN BOTH POWER AND RADIO MODES; (C) CAREFUL HAND DIGGING OF TRIAL HOLES USING 'SAFE DIGGING PRACTICE'. REFER ALSO TO 'HSA CODE OF PRACTICE FOR AVOIDING DANGER FROM UNDERGROUND SERVICES'. ESB TAKES NO RESPONSIBILITY FOR AND SHALL BEAR NO LIABILITY, HOWSOEVER ARISING, IN RELATION TO ANY DAMAGE, INJURY/DEATH OR LOSS OF SUPPLY AS A RESULT OF DAMAGE OR INTERFERENCE WITH ITS NETWORKS.

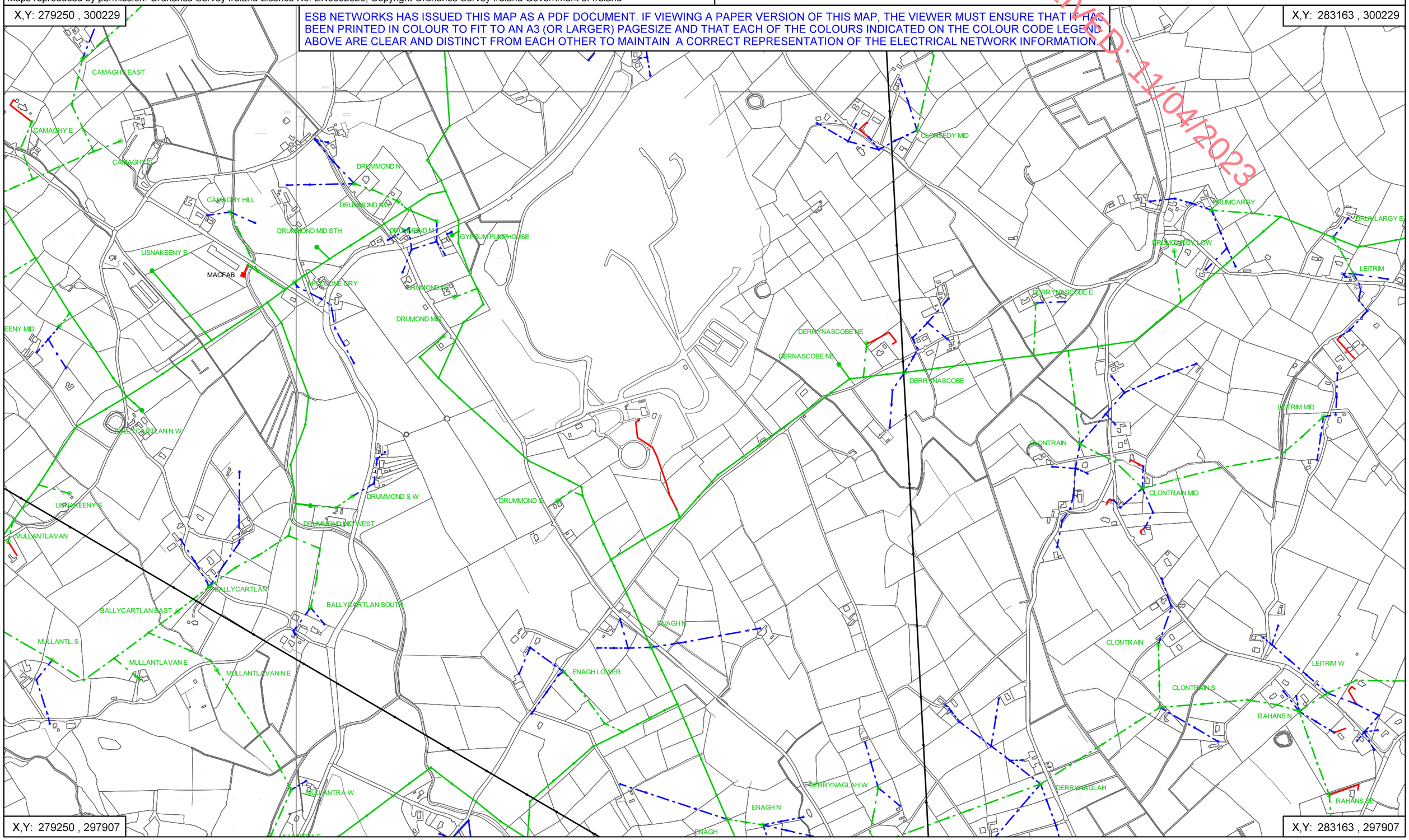
ESB NETWORKS HAS ISSUED THIS MAP AS A PDF DOCUMENT. IF VIEWING A PAPER VERSION OF THIS MAP, THE VIEWER MUST ENSURE THAT IT HAS BEEN PRINTED IN COLOUR TO FIT TO AN A3 (OR LARGER) PAGESIZE AND THAT EACH OF THE COLOURS INDICATED ON THE COLOUR CODE LEGEND ABOVE ARE CLEAR AND DISTINCT FROM EACH OTHER TO MAINTAIN A CORRECT REPRESENTATION OF THE ELECTRICAL NETWORK INFORMATION.

X,Y: 279250 , 300229

X,Y: 283163 , 300229

X,Y: 279250 , 297907

X,Y: 283163 , 297907



CONTENTS

TABLES

FIGURES

17.0 MAJOR ACCIDENTS & DISASTERS

17.1 Introduction

This chapter of the EIAR considers and assesses potential effects resulting from the Proposed Development; both the Mine Development and the further development of the Community Sports Complex.

The main elements of the Mine Development include the excavation at the Knocknacran West Open-Cast Mine, the restoration of the Knocknacran Open-Cast Mine and the continuation of use of the Knocknacran Processing Plant. It also includes the construction of a Cut-and-Cover Tunnel under R179 and a temporary diversion of the R179 during construction. The development requires the demolition of one residential house and three unoccupied houses and sheds.

Mining activities have been ongoing since 1988 at the adjacent Knocknacran Open-Cast Mine and since 2007 at the underground Drummond Mine. The gypsum mined from Knocknacran West is a replacement for the gypsum currently mined from Knocknacran which will be exhausted by 2027. Knocknacran Open-Cast Mine will undergo closure and restoration once Knocknacran West Open-Cast is operational, Drummond Mine is currently permitted to continue until 2032.

The Application Site boundary and a high-level layout of the Proposed Development is provided in Figure 17.1.

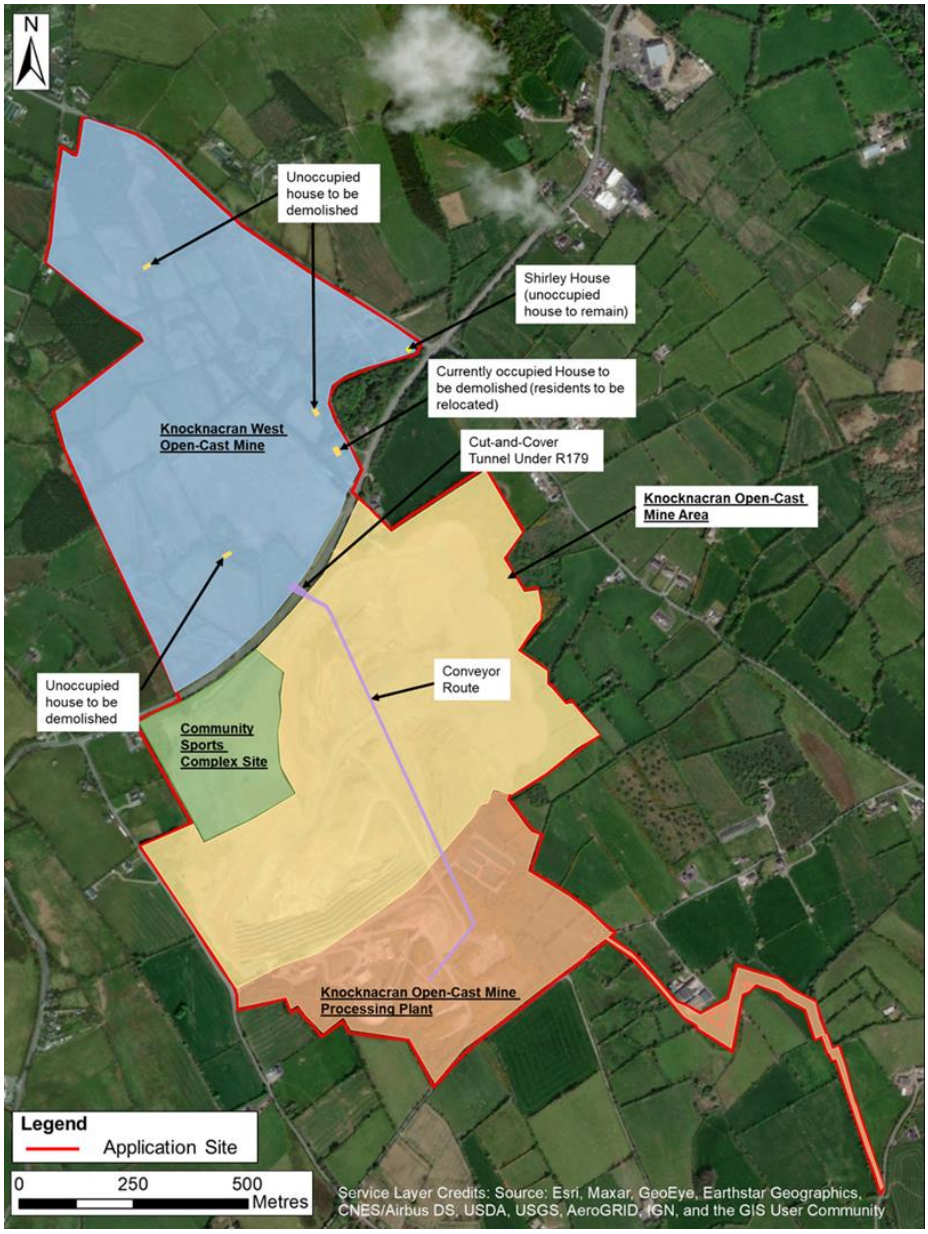


Figure 17.1: Application Site Boundary and general site layout

17.2 Legislative and Policy Context

The European Union Directive 85/337/EC required that certain private and public projects which are likely to have significant resultant environmental impacts are subject to a formalised Environmental Impact Assessment (EIA) prior to their consent. This Directive was subsequently amended by the EU through three amendments: 97/11/EC, 2003/4/EC and 2009/31/EC, which were then codified in Directive 2011/92/EU. Subsequently, on 16 April 2014, Directive 2011/92/EU was amended by Directive 2014/52/EU of the European Parliament and of the Council., (the Directive 2011/92/EU, as amended by Directive 2014/52/EU, will be hereafter referred to as the 'EIA Directive').

Article 5 of the EIA Directive sets down the minimum information to be supplied in an EIAR including data and information to be included by the developer in the EIAR identified in Annex IV of the EIA Directive. This Annex identifies in Section 5(d) that:

> *A description of the likely significant effects of the project on the environment resulting from, inter alia:*
>
> *(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters).*

Furthermore in Section 8:

> *A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. […] Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.*

The 2014/52/EU Directive was transposed into Irish law through European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (SI No. 296 of 2018) which amended the Planning and Development Act, 2000, and the Planning and Development Regulations, 2001.

17.2.1 Relevant Guidance

There is no specific Irish guidance for the assessment of major accidents and disasters in the context of EIA, therefore a number of guidance documents have been considered in the course of this assessment, these are identified below.

Guidelines on the information to be contained in environmental impact assessment reports, Environmental Protection Agency (EPA), May 2022

The 'Guidelines on the information to be contained in environmental impact assessment reports', were published in by the EPA in May 2022, (2022 EIAR Guidelines) with a view to facilitating compliance with the amended EIA Directive.

Provisions in the 2022 EIAR Guidelines include the requirement to describe the risk of accidents (with regard to substances or technologies used) in the characteristics of the project.

The 2022 EIAR Guidelines also emphasises the requirements of Annex IV of the EIA Directive which include that the EIAR is to contain a description of the likely significant effects of the project on the environment resulting from, inter alia: the risks to human health, cultural heritage or the environment (for example due to accidents or disasters).

During the impact assessment process, the 2022 EIAR Guidelines identify that the EIAR should also attempt to identify a reasonably foreseeable worst-case scenario as a context for 'likely significant effects'. The 2022 EIAR Guidelines furthermore notes that to address unforeseen or unplanned effects the EIA Directive requires the vulnerability of the project to risk of major accidents and /or disasters relevant to the project concerned are taken into account and that the EIAR explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined should be guided by an assessment of the likelihood of their occurrence. The 2022 EIAR Guidelines identify that this may be supported by general risk assessment methods or by a systematic risk assessment required under other regulations, for example a COMAH (Control of Major Accident Hazards involving Dangerous Substances) assessment.

Assessments of significant risk scenarios are documented outside of the EIA process, (e.g., subsidence investigation assessment). The EIAR Guidelines note that the EIAR should refer to separate assessments while avoiding duplication of their content.

Advice Notes for Preparing Environmental Impact Statements (Draft), Environmental Protection Agency (EPA), September 2015

The 'Advice notes for the preparation of Environmental Impact Statements' was also published draft by the EPA, and it should be noted that these were published prior to the transposition of the amended EIA Directive.

In the context of climate and flooding, the draft advice notes that *'potential for damage to the environment, cultural heritage or human health as a result of an accident or disaster caused by flooding should be addressed where significant'*; and also *'the worst-case impact of the project should be described should all mitigation measures fail. This includes the risk of major accidents and/or disasters due to climate change which are relevant to the project concerned'*.

The 2015 EPA Advice Notes also identify that where a development requires an assessment of significant environmental impacts outside of the EIAR (e.g., subsidence investigation assessment) then reference to the main considerations and findings of these assessments will generally be appropriate.

Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report, European Commission, 2017

This guidance document was an update of the 2001 document published by the European Commission. The document was published alongside Screening and Scoping Documents. The aim of these guidance documents is to provide practical insight to the stages in the EIA process, drawing upon experiences in Europe and worldwide.

The current revision of this document reviews of the scope of the environmental factors covered by the EIA Directive, with a focus on those factors that have been expanded in the 2014 amendments. The guidance identifies key considerations on accidents and disaster risks and identified that EIARs should address issues such as:

- What can go wrong with a Project?
- What adverse consequences might occur to human health and to the environment?
- What is the range of magnitude of adverse consequences?
- How likely are these consequences?
- What is the Project's state of preparedness in case of an accident/disaster?
- Is there a plan for an emergency situation?

LA 104 - Environmental assessment and monitoring, Design Manual for Roads and Bridges, Highways England, Revision 1, August 2020

In the context of EIA there is no dedicated Irish guidance for the assessment of major accidents and disasters for projects. In the absence of such guidance this document has also been referred to regarding risks of major events.

This document was published by Highways England for assessing, reporting and monitoring the environmental effects of certain projects in line with the requirements of the EIA Directive. In the context of major accidents and disasters the guidance identifies that assessments shall be made with regards to:

- Vulnerability of the project to risks of major events; and
- Any consequential changes in the predicted effects of that project on environmental factors.

The guidance notes that such assessments will have regard to major events which are of man-made origin and are naturally occurring. Also, the document details that when scoping major events the assessments should apply professional judgement in classifying specific definitions of major events and shall identify such events which are relevant to the project.

The guidance identifies that not all events warrant assessment, and as such, evidence should be provided to support the view that they are classified as major events. Evidence supporting the methodology and approach to assessing major events shall be provided.

In the identification of the baseline environment the assessment shall assess previous major accidents and disasters within the study area.

A Framework for Major Emergency Management, Government of Ireland, 2006

This document establishes a framework enabling An Garda Síochána, the Health Service Executive (HSE) and Local Authorities to prepare for and make a co-ordinated response to major emergencies resulting from events such as fires, transport accidents, hazardous substance incidents and severe weather.

The document identifies that it:

> *'… sets out mechanisms for co-ordination at all levels of major emergency management - on site, at local level and at regional level, it defines a common language or terminology to make inter-agency working simpler and it introduces a system to immediately determine a lead agency in every emergency situation. It also provides for linking to national level emergency management.'*

A Framework for Major Emergency Management, Guidance Document 1, A Guide to Risk Assessment in Major Emergency Management, Department of the Environment, Heritage & Local Government (DoEHLG), January 2010

The DoEHLG Guide to Risk Assessment in Major Emergency Management is intended to support the 2006 Framework text and to provide additional guidance on the risk assessment process.

The document identifies that it is presented as best practice in the area of Risk Assessment for Major Emergency Management. The document sets out a risk assessment procedure that should be applied. The document is divided into two parts: Part 1 details the steps of the risk assessment process, while Part 2 supplies guidance on how this risk assessment should be employed to inform any resultant mitigation and detailed planning.

Guidance on assessing and costing environmental liabilities, EPA, 2014a

This guidance is provided by the EPA and presents a systematic approach for assessing and costing environmental liabilities associated with the closure and restoration/aftercare, and incidents for activities falling under the various EPA authorisation regimes including the Industrial Emissions Directive (IED), Integrated Pollution Prevention and Control (IPPC), waste, wastewater discharge and dumping at sea. The guidance is based on the assessment of the plausible worst-case scenario.

Similar to the DoEHLG 2010 Major Emergency Guidance document, this EPA guidance presents a systematic approach for risk/hazard identification and risk assessment (analysis and evaluation). The document provides a matrix approach for the basis of rating the likelihood of an event occurring and the consequence of impact if the event occurs.

The EPA's environmental liabilities guidance then details the approach for calculating the level of financial provision required in relation to the risks identified by the environmental liabilities risk assessment process. This portion of the assessment is not relevant to EIA.

Major Accidents and Disasters in EIA: A Primer, Institute of Environmental Management and Assessment (IEMA), September 2020

This primer document on the assessment of major accidents and disasters in the context of EIA was published by the IEMA in September 2020. The document offers an assessment methodology based on known current practice to date and identifies key terminology that can be used in the assessment. As this is an emerging topic, the IEMA document is intended as a primer to introduce the concept of the topic and offer an initial appreciation of methodology that could be adopted.

The document provides the below terminology to describe 'major accidents' and 'disasters'.

- **Major Accidents:** Events that threaten immediate or delayed serious environmental effects to human health, welfare and/or the environment and require the use of resources beyond those of the client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events; and

- **Disaster:** May be a natural hazard (e.g. earthquake) or a man-made/external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident.

17.3 Assessment Methodology and Significance Criteria

17.3.1 Assessment Aims

As identified above, the key considerations of this assessment are, namely:

- The vulnerability, if any, of the Proposed Development to potential major accidents or disasters, which includes both natural (e.g. earthquakes) and man-made disasters (e.g. technological hazards);

- The Proposed Development's potential, if any, to cause major accidents and/or disasters, (with explicit reference to considerations for human health, cultural heritage, and the environment); and

- The identification of control and/or emergency preparedness measures which are in place, or that may need to be implemented, to prevent or mitigate the likely significant adverse effects of such events on the environment.

17.3.2 Temporal Scope

Temporally, the construction phase for the Community Sports Complex is ca. 2 years, while the Mine Development is ca. 1 year, there will be overlap of 1 year between these development phases. The

operational phase for the Mine Development is ca. 30-35 years, depending on market conditions while the Community Sports Complex is in operation in perpetuity.

The closure phase of the Mine Development begins after the operational phase has ceased. The restoration of the Proposed Development has been considered based on the proposals for rehabilitation and restoration for the site as set out within the Closure, Restoration and Aftercare Management Plan (CRAMP) that has been submitted with this planning application.

17.3.3 Geographical Scope

The assessment of major accidents and disasters directly covers the physical extent of the Site as shown in the red line boundary plan (Figure 17.1).

In the assessment of impacts from such events, the geographical extent of the EIA has been extended as appropriate to include the relevant sensitive receptors or developments.

17.3.4 Technical Scope

This assessment has been made with guidance from the 'Guidelines on the information to be contained in environmental impact assessment reports', published by the EPA in May 2022, and as detailed in the 2022 EIAR Guidelines the assessment will be supported by general risk assessment methods. These are identified below and are based on the DoEHLG Guide to Risk Assessment in Major Emergency Management (2010).

This assessment of major accidents and disasters was informed by the conclusions and recommendations of the preceding technical chapters of this EIAR, in addition to the literature listed above. The assessment has been undertaken on the assumption that all the mitigation and monitoring measures outlined in the preceding chapters will be implemented.

This assessment is also carried out under the assumption that the Proposed Development is be designed, constructed and operated in line with best practice and thereby results in a Low vulnerability of the Proposed Development to the risks of major accidents and disasters.

The assessment process is qualitative only, as it is an assessment of hypothetical situations that are difficult to quantify. The criteria presented in this section have been used to ensure the assessment is both robust and consistent.

17.4.4.1 Stage 1 - Establishing the Context of an Area

The objective of this stage of the assessment is to identify the characteristics of the area for which the risk assessment is being completed. This will influence the overall risk and the potential impact of any emergency resulting from a major accident or disaster. The context of the area will be established with reference to:

- Social – surrounding population centres and local receptors;
- Environmental receptors – Natura and protected areas;
- Infrastructure – major road, rail, shipping and airports;
- Water supplies and wastewater – Local authority supply schemes;
- Power suppliers – electrical supply routes; and
- Gas supplies – Local gas transmission lines.

17.4.4.2 Stage 2 - Risk / Hazard Identification

This stage of the assessment identifies the associated risks of possible unplanned and plausible events which may occur during the construction and operational stages of the Proposed Development. As identified previously this identification process will consider both the Proposed Development's vulnerability to accidents and / or Disasters and the Proposed Development's potential to cause accidents and / or disasters.

17.4.4.3 Stage 3 - Risk / Hazard Likelihood and Consequences

Likelihood

The likelihood of occurrence of each of the risks / hazards identified will be assessed in accordance with the criteria identified in Table 17.1. The assessment considered the overall proposed Site safety and management procedures and proposed environmental controls / mitigation when making evaluations. Therefore, the reasonable likelihood ranking allocated to each of the risks or hazards has made the assumption that all proposed mitigation measures and / or the relevant safety and management procedures are in place, operational and have been/will be successful in reducing the potential for a major accident and / or disaster to occur.

Table 17.1: DoEHLG, 'A Guide to Risk Assessment in Major Emergency Management' (2010), Risk Likelihood Classification

Ranking	Likelihood	Description
1	Extremely Unlikely	May occur only in exceptional circumstances; once every 500 or more years
2	Very Unlikely	Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities or communities; and / or little opportunity, reason or means to occur; may occur once every 100-500 years.
3	Unlikely	May occur at some time; and /or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisations worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years
5	Very Likely	Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.

Consequence

The DoEHLG 2010 Guidance sets out criteria to classify emergencies on a five-level scale from 'Minor' to 'Catastrophic' (Table 17.2).

The consequence rating assigned to each risk has assumed that all proposed mitigation measures and/or safety procedures have failed to prevent the major accident and/or disaster.

Table 17.2: DoEHLG, 'A Guide to Risk Assessment in Major Emergency Management' (2010), Risk Classification Table

Rank	Classification	Impact	Description
1	Minor	Life, Health, Welfare	Small number of people affected; no fatalities and small number of minor injuries with first aid treatment.
		Environment	No contamination, localised effects
		Infrastructure	<€0.5M.
		Social	Minor localised disruption to community services or infrastructure (<6 hours).
2	Limited	Life, Health, Welfare	Single fatality; limited number of people affected; a few serious injuries with hospitalisation and medical treatment required. Localised displacement of a small number of people for 6 - 24 hours. Personal support satisfied through local arrangements.
		Environment	Simple contamination, localised effects of short duration
		Infrastructure	€0.5-3M
		Social	Normal community functioning with some inconvenience.
3	Serious	Life, Health, Welfare	Significant number of people in affected area impacted with multiple fatalities (<5), multiple serious or extensive injuries (20), significant hospitalisation. Large number of people displaced for 6-24 hours or possibly beyond; up to 500 evacuated. External resources required for personal support.
		Environment	Simple contamination, widespread effects or extended duration.
		Infrastructure	€3-10M.
		Social	Community only partially functioning, some services available.
4	Very Serious	Life, Health, Welfare	5 to 50 fatalities, up to 100 serious injuries, up to 2000 evacuated.
		Environment	Heavy contamination, localised effects or extended duration.
		Infrastructure	€10 - 25M.
		Social	Community functioning poorly, minimal services available.
5	Catastrophic	Life, Health, Welfare	Large numbers of people impacted with significant numbers of fatalities (>50), injuries in the hundreds, more than 2000 evacuated.
		Environment	Very heavy contamination, widespread effects of extended duration.

Rank	Classification	Impact	Description
		Infrastructure	>€25M
		Social	Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support.

17.4.4.4 Stage 4 - Risk / Hazards Assessment and Evaluation

The identified risk / hazard 'likelihood' and 'consequence' are combined in a matrix to indicate the overall risk score for the particular major accident or disaster, (Table 17.3). This matrix, identifies and evaluates risks as 'Low' risk, 'Moderate' risk and 'High' risk.

Where particular risk of major accidents or disasters is identified as Moderate or High then the assessment shall interpret if additional mitigation is required. Where a risk has been identified as Low then it is considered that the existing measures in place are sufficient for the management of that risk.

As per the DoEHLG 2010 Guidance those emergencies which have been classified as 'Serious', 'Very Serious' and 'Catastrophic' are deemed to be 'Major Emergencies'.

Table 17.3: Matrix for determining significance of effect

		Consequence				
		1 Minor	2 Limited	3 Serious	4 Very Serious	5 Catastrophic
Likelihood	5 Very Likely	Low	Moderate	High	High	High
	4 Likely	Low	Moderate	Moderate	High	High
	3 Unlikely	Low	Low	Moderate	Moderate	High
	2 Very Unlikely	Low	Low	Low	Moderate	Moderate
	1 Extremely Unlikely	Low	Low	Low	Low	Low
DoEHLG 2010 Classification		Normal Emergency		Major Emergency		

17.4 Baseline

17.4.1 General Aspects of the Surrounding Environment

The Application Site includes the existing Knocknacran Mine which was a long-established mineral extraction operation including a processing plant located towards the south of the Mine.

The overall Application Site area is ca. 140.4 ha[1]. This comprises the proposed Knocknacran West Mine (ca. 54.3 ha), the processing plant (ca. 24.6 ha), the proposed second phase of the Community Sports Complex (ca. 8.6 ha) (the first phase of which was permitted under Reg. Ref. 20/365) and the existing Knocknacran Mine restoration are, (ca. 51.5 ha).

The overriding land use surrounding the Site can be characterised as rural in nature, with land uses in the vicinity of the Site being predominantly agricultural and one-off residential. Industrial and commercial activities are also found within the surrounding area.

The lands contiguous to the boundaries of the Site are in mixed use combining agricultural use, residential use, commercial use (a petrol station adjacent to the Site on the R179) and extractive industry (existing Drummond Underground Mine operated by SGMI which extends laterally beneath the Site to the south and Cormey opencast Clay Pit which is operated by Breedon Brick Ltd). There are scattered residential properties in the vicinity of the Site, primarily concentrated along the Regional Road (R179) and the local road network. One residential estate (Clonsedy) is located to the northeast of the existing Knocknacran Mine site. The village of Drumgoosat is located to the northwest of the Site and contains a church and graveyard, national school, mushroom farm, shop and several residential houses.

The Knocknacran West Mine site encompasses the former Drumgoosat workings to the north of the R179. Prior to the initial subsidence event in September 2018 (refer to Chapter 7.0), activity on the site was mixed use. Above ground the land was previously used for pastoral farming, amenity uses (former Magheracloone Mitchell's GAA Club grounds and Community Centre) and a brownfield area to the north of the site which was the site of the former Drumgoosat Mine surface plant area which had become an area of semi-natural woodland. Below ground the majority of the site comprised (and continues to comprise) the former Drumgoosat Mine workings. Since the September 2018 subsidence event, the only activities which have taken place on the Site have related to remediation, monitoring and management of the Site. The former Gaelic Athletic Association (GAA) Club ground, Community Centre buildings and pitches were removed as part of site remediation works. Further details of these works have been discussed in Chapter 3.0 (Project Description) and Chapter 7.0 of this EIAR.

17.4.2 Context of the Surrounding Area

Social – Surrounding Population Centres

Land use surrounding the Application Site can be characterised as rural in nature, with land uses in the vicinity of the Site being predominantly agricultural and single-house residential. Industrial and commercial activities are also found within the surrounding area.

With regards to local more condensed population centres, one residential estate (Clonsedy) is located to the northeast of the existing Knocknacran Mine site; this residential estate has 31 dwellings. The village of

[1] The red line area encompasses a small area of the R179 (ca. 1.4 ha) which accounts for the slight discrepancy in total site area.

Drumgoosat is located to the northwest of the Site and both the village and the Application Site are located within the Enagh Electoral Division (ED). In 2016 the Census recorded 683 people in this ED.

Mine site operations generate employment for up to 40 full-time personnel, with a number of additional sub-contractors (up to ca. 45 at any one time) depending on operational needs. Indirect site employment is generated by contract overburden removal/stripping, contract drilling and blasting, suppliers of products and services such as fuel and oil and machinery suppliers. Employees will work in varied shift patterns and therefore not all employees would be located on Site at any one time. Generally, these employees are proposed to be located within the processing site, with teams of personnel operating in the open-pit.

Environmental Receptors – Natura Areas

Sites of international importance, including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are collectively known as Natura 2000 sites. These sites contain examples of some of the most important natural and semi-natural ecosystems in Europe.

A search on the National Parks and Wildlife Service's (NPWS) database showed that there are no designated nature conservation areas, within 15 km of the Application Site. This search included Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) within 5 km of the Application Site. A total of four pNHAs were identified within < 5 km of the proposed project footprint.

Infrastructure – Major Road, Rail, Shipping, Airports

The R179 runs in a general southwest / northeast direction through the Application Site.

There are no active rail lines located within 10 km of the Proposed Development. A historical rail line is located in Kingscourt ca. 3.2 km to the south of the Site.

There are no shipping ports or airports located within 10 km of the Proposed Development.

Water Services

The main water service provider in the area is the Magheracloone Group Water Scheme (MGWS) which comprises a ca. 132 km long distribution network. MGWS is sourced primarily from Lough Greaghlone and supplies domestic dwellings, farms, schools, churches and businesses. Potable water is supplied at the existing mine for use in the office and workshop by the MGWS, well water is used to provide water for the wheelwash onsite.

A 63 mm watermains supply runs partially along the R179 southward. Along the L4900 a 150 mm watermain runs south-easterly where it connects at the junction to an 80 mm mains running northwards along the R179. A 100 mm watermain runs south eastwards along the L8830. Along the western boundary of the Knocknacran West Mine site an 80 mm watermain runs southwards from Drumgoosat village to connect to the watermain at the junction with the R179. An 80 mm watermain also runs south-eastwards along the L4816 by the existing Knocknacran Mine site.

A third party well survey was undertaken during September 2019 to map private wells within 500 m of the Site and the existing Drummond Mine. This well survey identified 22 wells within 500 m of the Site and Drummond Mine. Wells are used as domestic supplies, agricultural supplies, backup supplies or are not in use. The greatest occurrence of wells is to the southeast, nearly all of these wells are domestic supplies as the MGWS does not extend this far southeast in the area.

As identified above, water is supplied in the locality either by private well or the MGWS, as such, Irish Water does not service the area, except for a small section along the R179 located west of the Application Site.

Sewerage services in the vicinity of the Site are covered by independent septic tank systems. The existing Knocknacran and Drummond mines site's office area has an independent septic tank system.

Power Suppliers – Electrical Supply Routes

The existing Knocknacran Mine site is connected to the ESB grid by an onsite medium voltage ESB substation which connects to the overhead lines to the south of the Site by an underground line.

Overhead ESB lines traverse the Knocknacran West site, border the western side of the Community Sports Complex and border the Knocknacran Mine to the south.

Gas Supplies – Local Gas Transmission Lines

There is a Gas Networks Ireland (GNI) 315 PE 4 bar distribution line located within the Site. This distribution line follows the route of the R179.

17.4.3 Large Industry and Seveso Sites

Seveso Sites are defined as industrial sites that, because of the presence of dangerous substances in sufficient quantities they are required to be regulated under the Seveso III Directive (2012/18/EU) through the Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015), (the "COMAH Regulations"). There are no upper-tier or lower-tier Seveso sites within 10 km of the Proposed Development.

17.4.4 Major Accidents and Disasters in the Existing Environment, and Potential Effects

Major accidents and disasters in the existing environment include subsidence events and the potential for collapse of underground workings which may result in serious injury or loss of life to underground workers, or a collapse of underground workings. Other scenarios are considered later in the document.

With regards to the potential for surface subsidence events to coincide with local residential receptors; it should be noted that these surface subsidence events may only occur where underground extraction has taken place directly below the property, and underground extraction has not taken place under such receptors. Underground workings extend under the majority of the site, with some workings extending under the R179, L4900 and to the southwest of the Site (Figure 17.2).

In 2018, an incident occurred at the gypsum mine where a high volume of water ingress into the mine resulted from normal mining activities intersecting an unforeseen fault. As was normal practice for many years this water was pumped to the old Drumgoosat Mine workings to be stored for discharge to the River Bursk during the winter season. The high volume of water meant that the water reached higher levels in the mine than had historically occurred. In September 2018, a subsidence event took place in the area of the Magheracloone GAA Facility.

Since the subsidence event in September 2018, work has been undertaken by SRK (with review by Wardell Armstrong for the Department of Communications, Climate Action and Environment (DCCAE)) to assess the causes and current, and future, stability of the existing underground workings beneath the site. This is discussed extensively in Chapter 7.0, with specific reports included as appendices to Chapter 7.0, Land, Soils and Geology. The R179 Kingscourt to Carrickmacross road also closed for a number of weeks until the risk from further land subsidence could be determined. This has concluded that loss in underground mine stability was localised and that further mine collapse is unlikely.

A monitoring programme has been established at the site and for the R179 and L4900. As part of the programme, visual inspections, including drone surveying and geotechnical monitoring are undertaken on a continuous (real time) basis.

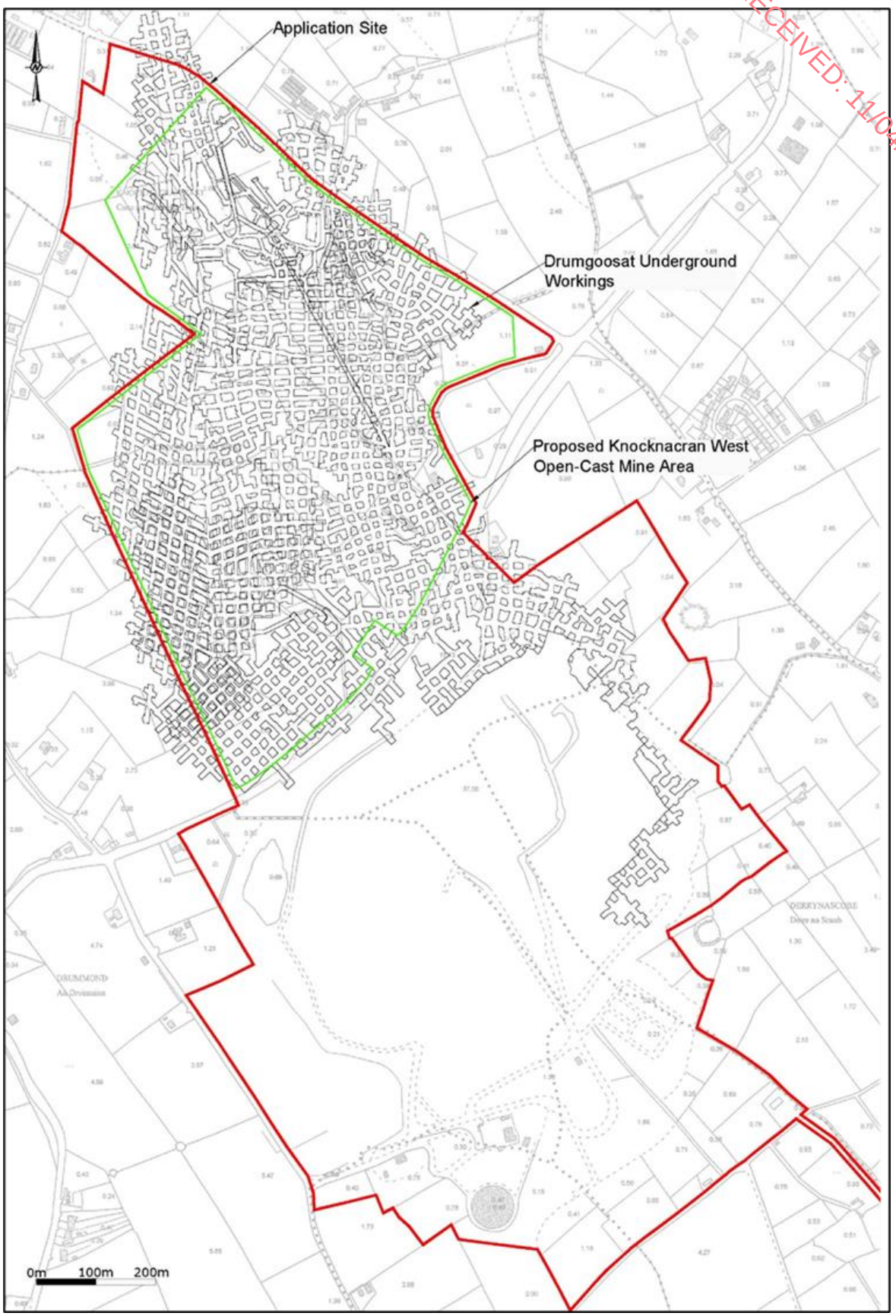


Figure 17.2: Application Site Boundary (red line) and plan showing extent of underground workings

The former Drumgoosat workings have historically been used to store water, however, this is no longer taking place. Instead, the workings are being gradually dewatered by the Drumgoosat dewatering borehole to the south of the R179. Further discussion of this dewatering can be found in Chapter 8.0, Water.

As noted previously, the only activities which have taken place over the Drumgoosat workings have related to remediation, monitoring and management of the Site. The former GAA Club buildings and pitches were removed as part of site remediation works. The final remediation report for these works has been provided in Appendix 3.1 of this EIAR. Remediation of crownholes and fissures associated with subsidence events have also taken place. The remediation works were finished in 2020 by grading and landscaping of the grounds to grassland. The site of the former GAA grounds remains not in use, as does the wider site over the former Drumgoosat workings and will continue to remain not in use for the foreseeable future. Areas which were not directly impacted by recent subsidence events, are currently unmanaged fields and woodland areas.

Site Health and Safety

SGMI prioritise the health and safety of its staff and all stakeholders who may be affected directly and indirectly by the Site's operations. In addition to engineering controls to manage and mitigate risks, the independently audited safety management system places a great focus on behavioural safety. This program has been very successful with very few injuries and near misses occurring in its operations at Knocknacran and Drummond in recent years. Incidents which require first aid, medical intervention or incur lost time, are recorded in the SGMI safety system as TF3, TF2 and TF1 incidents, respectively. In the past 10 years one such incident was recorded, (TF3 – first aid), where a delivery driver tripped on a stairs.

Environmental Liabilities

As part of the EPA's Licencing process the Proposed Development will be required to regularly update their assessments on environmental liabilities for the overall Site. This assessment was last revised in April 2021 and subsequently issued to the EPA, (KD Environmental Ltd, 2021).

17.5 Key Characteristics of the Proposed Development

The two distinct elements of the Proposed Development are as follows:

I. The Mine Development which includes the following:

- The proposed 'Knocknacran West Open-Cast Mine'/ (Knocknacran West Mine) where it is proposed to extract gypsum and source material (interburden and overburden) for the restoration of the existing Knocknacran Open-Cast Mine back to near original ground level. Material will be extracted by open-cast mining methods. Blasting will occur within the gypsum layer, while the overburden and interburden is removed by mechanical means (excavators) and no blasting will occur within these layers. The proposed mine encompasses the majority of the remaining old workings at the former Drumgoosat (underground) Mine. It also includes the construction of a Cut-and-Cover Tunnel under the Carrickmacross to Kingscourt regional road (R179) for the transport of gypsum (by haulage truck and covered conveyor depending on operational demands) to the existing processing plant at Knocknacran Open-Cast Mine, and for the transport of overburden and interburden (by haulage truck) for the purpose of restoring the existing open-cast Knocknacran Open-Cast Mine. The Cut-and-Cover Tunnel will require the temporary diversion of the R179 during construction, the diversion will be a two-lane diversion ensuring continuous use of the R179. To enable development of the Knocknacran West

Open-Cast Mine, the demolition of one residential house and three unoccupied houses and sheds will be required. This development will also require the pumping of water from the existing Drumgoosat underground workings via an existing borehole on the Knocknacran West Mine site. Upon cessation of mining activities, Knocknacran West Open-Cast Mine will also undergo restoration;

- The 'Knocknacran Open-Cast Mine'/ (Knocknacran Mine) area, is located on the existing Knocknacran Open-Cast Mine site, where it is proposed to restore the existing open-cast extraction area using material (interburden and overburden) from the proposed Knocknacran West Open-Cast Mine to near original ground level. The existing Knocknacran Open-Cast Mine will be in active closure and restoration during the operation of the proposed Knocknacran West Open-Cast Mine. This proposed restoration plan is a revision of the existing plan included in the CRAMP (Closure, Restoration & Aftercare Management Plan). The existing mine entrance will also be replaced on this site;
- The continuation of use of the current Knocknacran Open-Cast Mine processing plant, water management facilities and associated infrastructure (including mine water discharge pipeline and discharge point), which is to be referred to as the 'Knocknacran Processing Plant'. This is located on the existing Knocknacran Open-Cast Mine site and to the immediate south of the proposed Knocknacran Open-Cast Mine Restoration area; and

II. The proposed 'Community Sports Complex' where it is proposed to construct a community sports complex. Monaghan County Council (MCC) recently granted permission for a playing pitch, dressing rooms and associated infrastructure/facilities on the Community Sports Complex site under Reg. Ref. No: 20/365. The 20/365 permission relates to an initial phase of development of the proposed Community Sports Complex.

Existing landscaping (including screening berms) on the Site will be left intact to continue mitigation against noise and potential dust emissions from operations, as well as to offer continued reduced visibility of the Site from the public road network and surrounding lands.

The existing Knocknacran Mine site and activity are subject to EPA Licencing (Licence number P0519-04). The proposed Mine Development presented here (from the operational phase onwards) will be subject to control by an IE Licence. Prior to that, the construction period of the Mine Development will be regulated by Monaghan County Council (MCC). The construction and operational life of the proposed Community Sports Complex will be regulated by MCC.

The existing Knocknacran Mine has a dedicated environmental management team and operates an Environmental Management System (EMS) which will continue for the proposed Mine Development. With regards to operational management and preparedness for accidents and emergency events, the Mine Development will maintain and tests an Emergency Response plan. This plan was last reviewed on 30 March 2021.

17.6 Potential Effects – Hazard Identification, Assessment and Evaluation

17.6.1 Potential Major Accidents and Disasters Events

The following sections will consider:

- The **vulnerability of the Proposed Development** if any, to potential major accidents or disasters, which includes both natural (e.g. earthquakes) and man-made disasters (e.g. technological hazards);

- The **Proposed Development's potential to cause**, if any, major accidents and/or disasters, (with explicit reference to considerations for human health, cultural heritage, and the environment).

For the purposes of this assessment, potential major accidents or disasters are categorised as 'natural hazards' or 'industrial hazards'. These hazards which the Proposed Development is vulnerable to and could cause are considered to be:

- Natural Hazards:
  - Seismic Events;
  - Storm Events;
- Industrial Hazards:
  - Aircraft strike;
  - Structural failure and collapse of the open-pit faces;
  - Subsidence event, including the collapse of overlying public roads and overlying lands;
  - Fire and explosions;
  - Contamination of underlying soils and groundwater from fire water run-off, and hydrocarbon and chemical releases;
  - Gas leaks;
  - Unplanned explosions; and
  - Unplanned outages and disruption to services, including groundwater pumps and the power systems.

17.6.2 Vulnerability of the Proposed Development to Major Accidents and Disasters

17.7.2.1 Vulnerability to Seismic Events

Ireland lies at the northwest margin of Europe, adjacent to the continental shelf and is characterised by very low levels of seismic activity. This lack of seismic activity in Ireland has been demonstrated by the low number of historical observations, regional seismic assessments and modern instrumental readings. Seismic activity in Ireland is significantly lower than in Britain, despite a similar geology.

Historically, only 26 credible seismic events were felt in Ireland in the interval 1500 to 1970 (EPA 2014b). Of these 26, 13 of these were earthquakes magnitudes of around 5.0, occurred in western Britain, and were widely felt across Britain and Ireland. The largest earthquake of these 13 was the magnitude 5.4 (Richter Scale) Wales earthquake of 1984, about 190 km from the Application Site. No earthquake in Ireland has produced a surface rupture, and typically fault rupture lengths for the largest British earthquakes have a length of 1 – 2 km, with a slip of 10 cm.

In the methodology for this chapter, it is considered that the likelihood of significant seismic events occurring which would impact the Proposed Development are Extremely Unlikely.

A potential impact from a significant seismic event on the Proposed Development includes a structural failure of the open pit face. It is considered that there is limited potential for contamination. There is the potential for person working in the area of the collapse, (or be on the adjacent roadways), therefore there is a potential for greater than one fatality and less than five. It is considered that the classification of the consequence will likely be no greater than Serious.

The overall significance of the potential impact from a seismic event is considered to be **Low**.

17.7.2.2 Vulnerability to Storm Events

Extreme storm events with prolonged rainfall have the potential to contribute to increased runoff and discharge patterns, groundwater recharge, the mobilisation of suspended solids and flooding.

17.7.2.3 Vulnerability to Aircraft Collisions

As identified previously, there are no airports within 10 km of the Proposed Development. The Proposed Development does not include the inclusion of any structures of significant height, and as such consultation with the Irish Aviation Authority was not deemed to be required. It is considered that potential causes of an aircraft strike on the Site would be as a result of failure of air traffic control, an act of terrorism, or human error or negligence. Therefore, the likelihood of an aircraft to collide with the Site would be that of any other parcel of land in the locality. In the methodology, it is considered that the likelihood of the aircraft strike occurring which would impact the Proposed Development is Extremely Unlikely. Given the potential of such an incident to cause greater than 50 casualties the consequence is deemed to be Catastrophic.

The overall significance of the potential impact from an aircraft strike is considered to be **Low**.

17.6.3 Proposed Developments potential to cause Major Accidents and Disasters

17.7.3.1 Potential to cause structural failure and the collapse of the open pit face and debris falls

The nature of the Proposed Development requires that materials are blasted and extracted from working stone faces.

Pit face collapse and debris falls can occur from improper use and deployment of mining explosives, rock fall, incorrect geotechnical support plan, poor management of operations, unidentified geotechnical structures and damage from malfunctioning or poorly operated equipment.

The improper management of pit faces and structures, and the potential subsequent failure may endanger, injure or fatally injure persons working in proximity to those faces.

The Proposed Development has been planned and designed to ensure it can be developed without becoming a significant hazard both during its operational and restoration phases, and during subsequent after use. The phased extraction and the design of the proposed open-cast mine is based on criteria presented in Chapter 2 of this EIAR and follows the HSA's 'Guidelines to the Safety, Health and Welfare at Work (Quarries) Regulations 2008' (April 2020).

The maximum safe height and angle of excavated faces is influenced by the geology and physical properties of the material, the size, height and type of machinery and working methods used. A geotechnical slope stability analyses has been carried out for the Proposed Development as part of the design. A number of important stability design criteria are provided in the design, however in general, the benches will be 6 m high with 6 m benches widths, and a 45^{o} batter angle on bench faces in the interburden (and a batter angle of 27^{o} in the overburden). Geotechnical parameters are supported by extensive operational data from the existing Knocknacran open-cast and geotechnical analysis of borehole data within the new development area. The Knocknacran West Pit Slope Stability Preliminary Assessment report (Golder 2019) has been provided as an appendix to Chapter 7.0 of this EIAR.

Geotechnical assessments will be conducted on a regular basis by an experienced and suitably qualified geotechnical engineer on the Site. The current slope angles are designed to ensure that the risk of slope failure is effectively eliminated by using a suitable safety factor. On-going geotechnical monitoring by means of extensometers will continue throughout the life of the mine along the adjacent R179 and L4900 roads.

With the implementation of such design, mitigation measures, management practices and the implementation of the recommendations identified in the geotechnical assessments it is considered that the likelihood of such risks / hazards occurring is Very Unlikely. There is the potential for person working in the area of the collapse therefore there is a potential for greater than one fatality and less than five; it is considered that the consequence will likely be no greater than Serious. It is anticipated that there would be normal community functioning with some inconvenience of road closures (should an event occur in close proximity to these roads). If an event were to occur away from public roads and within the confines of the Site then there would be no disturbance to the local community. It is considered that there is limited potential for contamination, but any effects would be localised.

As detailed in Sections 7.6.2 and 7.6.4 of Chapter 7.0 (Land, Soils and Geology), consideration has been given to the potential risk of subsidence caused by personnel or plant on the mine site working over areas above the former underground mine during construction and operations. SRK conclude in their technical memorandum (Appendix 7.13) that ground vibrations initiated by equipment (during construction and operations) are unlikely to cause any new subsidence on the Site.

The overall significance of the potential impact from the collapse of the open pit face is considered to be **Low**.

17.7.3.2 Potential to cause sinkholes beneath the public roads, (R179 and L4900)

In terms of major accidents, the worst consequence scenario for subsidence is the development of a crownhole/sinkhole under an adjacent public road. The underground workings do not directly underly residential dwellings or other sensitive receptors therefore that scenario has been ruled out.

In assessing the likelihood of sinkhole occurrence under the adjacent public roads it is important to differentiate between the causes of the September 2018 subsidence event and potential future subsidence mechanisms in the underground workings.

Following the September 2018 subsidence event, work has been undertaken by SRK (with review by Wardell Armstrong for the DCCAE) to assess the causes and current as well as future stability of the existing underground workings beneath the site, (SRK, 2018). Golder also reviewed each of these reports and completed its own analysis to support an opinion on the work of the two consulting firms. Numerical stress modelling was employed in the investigation of this failure, concluding that softening of the gypsum (by a combination of (i) infiltration of water into joints and cracks within the gypsum that may result in blocks dislodging from the roof and pillar sidewalls; and (ii) to a lesser extent the dissolution of gypsum by non-saturated water flowing through the underground workings) must have occurred, probably due to this part of the mine being used for storing water as noted in Section 17.4.4. Analyses were performed to predict the stability of pillars below the R179 and L4900 roads and it was concluded by SRK (2018) that there was very low risk of further mine failures affecting the roads. Monitoring of a section of L4900 which has experienced gradual historic subsidence and inspection of smaller pillars below R179 with a borehole laser scanner was recommended.

Wardell Armstrong LLP (2018) reviewed the work completed by SRK from 1999 to 2018 and undertook their own analyses of pillars below the community centre collapse and at several locations below the L4900 and R179 roadways. They also used numerical stress and deformation modelling, applying similar approaches to SRK. In critical respects, Wardell Armstrong concurred with SRK's conclusion that the risk of future mine instability was very low. Where there was a minor difference in opinion related to the predicted stability of one pillar below R179, drilling investigations have since been undertaken to provide confirmation of the current mine conditions in the areas of concern. Using results of laboratory strength tests, observations from

earlier underground visits, new drilling investigations and laser scans of selected mine workings, SRK assessed the stability of the mine below the R179, (SRK, 2020).

SRK (2020) investigated a number of different working zones beneath the R179. Based on the assessment SRK identified that none of the zones contained all the necessary criteria for sinkhole/crownhole development. The assessment also concluded overall that *'Historically, there has been no instance of mine induced stability along and adjacent to the R179. Based on the investigations carried out, the geotechnical analysis, and interpretation of the cloudscan laser surveys, no high risk, unstable undermining areas have been identified. The laser surveys and the geotechnical borehole logging have provided strong evidence that there has been virtually no deterioration in the mine conditions since the excavations were created. This provides confidence that the roof beams and pillars are still doing the job for which they were designed, which is to support the underground openings and prevent surface subsidence. On this basis, the R179 continues to be safe to use.'*

The assessments carried out since the 2018 subsidence event have contributed to the understanding of pillar and overall mine stability. Measures developed following the assessments, include placing quantities of sufficiently low permeability material (i.e. mudstone) against worked out gypsum faces and old underground mine workings to prevent infiltration of fresh (undersaturated) surface water into underground mine workings (SRK, 2019b).

SRK (2019a) also identified that with regards to potential future instability, should it occur, it would likely be progressive in nature and take the form presented below:

1. Immediately above the underground room the roof beam blocks or slabs of gypsum, isolated by flat bedding planes and vertical joint planes, may start detaching themselves from the roof resulting in a thinning of the roof beam at the point of detachment;
2. If this process continues to propagate through the roof beam eventually the roof beam becomes so thin the weight of the overlying drift, mudstone, and dolerite will cause the roof beam to collapse and fail; and
3. With no roof beam to support the overlying drift, mudstone, and dolerite, this material becomes free to flow or fall into the mine workings. It should be noted that this tends to be a slow process as these materials are, to a degree, self-supporting; however, ultimately, there could be a collapse causing the development a crownhole on surface.

To continually assess the potential for such instability SGMI have employed a number of mitigation and monitoring measures. These measures seek to monitor potential future instability and to ensure the overall reduction in likelihood of a major accident or disaster occurring from potential subsidence events. A Trigger Action Response Plan (TARP) has been implemented for mine workings underlying the R179 and L4900. The TARP is a common tool in the mining industry used for managing potentially critical situations from a mine safety point of view. The monitoring system installed by SGMI comprises multi-point borehole extensometers installed in eight of the boreholes drilled to investigate the condition of the underground workings below the L4900; and in five locations to assess the workings below the R179. This monitoring system provides an early warning of failure of the gypsum roof beams that lie at depth below the carriageways of the L4900 and R179 roads and potential migration of instability to surface that may affect the stability of the road and the safety of road users.

The L4900/R179 monitoring system was commissioned after application of the baseline values and successful testing of the e-mail and SMS alerts. A dedicated PC with appropriate programming was set up in the Mine Office to allow data to be collected remotely from the dataloggers (and backed-up). The system was

calibrated, and the system readings were tested against the appropriate risk categories specified in the TARP, and that the correct alarm values specified and email/SMS alerts were functioning. When extensometer movement exceeds the trigger level for each risk state, a number of alarms will be configured for each extensometer rod. These alarms will allow the data logger to assess if the upper or lower extensometer has moved from datum by more than 10 mm or by more than 40 mm. In either event, this will cause an automatic alarm to be generated for any of the extensometers. These alarms will be sent by SMS message to four specific mobile phones for action to be taken: Mine Manager, Mine Production Manager, Mine Maintenance Manager, and Mine Surveyor. The event for which the alarms have triggered are located deep underground and indicate a small amount of movement in the roof beam – not roof beam failure. When an alarm is triggered, the surface monitoring point associated with the extensometer should be surveyed. There is only a risk of a surface event if the surface levelling stations associated with the extensometer for which the alarm has been triggered also show excessive movement.

With the implementation of the TARP and the predicted slow process that is involved with potential pillar collapse, the development of sinkholes/crownholes under the adjacent public roads is not expected to occur. It is therefore considered that the overall likelihood for this appearance of sinkholes under the public roads is Unlikely.

Such an incident has the potential to cause more than one fatality, therefore the consequence of this scenario is considered to be greater than Limited and would be Serious. It is considered that the scenarios would have limited potential for contamination and would be simple and localised. There would be overall normal community functioning with some inconvenience of road closures.

The future monitoring programme at the Application Site will include on-going monitoring of underground pillar integrity along the R179 and L4900, subsidence monitoring and regular stability surveys of the open-pit slopes (and benches).

The overall significance of the potential impact from a sinkhole event under and adjacent public road is considered to be **Moderate**.

17.7.3.3 Potential to cause sinkholes beneath other overlying lands

There is the potential for sinkholes to develop in areas of overlying agricultural lands. In comparison to the scenario discussed in Section 17.7.3.2, the consequences are considered to be less as there is a lower potential for fatalities, injuries, environmental contamination or damage to community function. The Proposed Development will involve the removal of the underground workings for most of the Site however some areas of the workings will remain. The likelihood of occurrence of sinkholes in these other overlying lands is considered to be Unlikely.

A study completed by SRK in 2022 (Appendix 7.15) considered the longterm mine stability and subsidence risks associated with workings that remain beneath the R179 and L4900 during mining and subsequent flooding. This report also considers the subsidence risks posed to third party lands beyond the open-cast void perimeter below which existing underground mine workings remain.

In relation to lands beyond the limit of the open-cast mine area, where Upper Seam Gypsum workings are identified as being shallow (within ca. 30 m of the surface) there may be potential for the development of crownholes as the workings are flooded during the formation of the open-cast/quarry lake.

However, embedded design mitigation measures (Sections 7.7.4.1 and 7.7.6.1 of Chapter 7.0 (Land, Soils and Geology) will be carried out to seal the Upper Seam Gypsum workings exposed in the open-cast to inhibit

water ingress into the workings and thereby reducing the risk of the formation of crown holes. Section 7.6.5.5 of Chapter 7.0 (Land, Soils and Geology) provides a methodology for sealing the underground workings where they intersect the open-cast mine.

The remaining workings in the Upper Seam Gypsum, which adjoin the south of the site, will be sealed off to prevent ingress of water beneath these lands, with material (mudstone from site) of ca. 10^{-9} m^2 permeability. The Lower Seam Gypsum workings in this area will be sealed during restoration by the emplacement of backfill material.

The north of the Knocknacran West site will be fully restored to near original ground levels and direct water ingress to the underground workings will therefore be cut off from the waterbody.

The risk posed to lands adjoining the site is therefore considered to be low.

The likelihood of fatalities and injuries from sinkholes on these lands would be low and it is considered that the overall consequence would be Limited in nature. There would be a limited number of people affected and normal community functioning would continue.

The overall significance of the potential impact from sinkholes in overlying agricultural land is considered to be **Low**.

17.7.3.4 Potential to cause Fire / Explosion

During the operation of the Proposed Development there is potential for fire to occur from vehicle collisions, malfunctioning equipment or infrastructure at the oil or chemical storage area, and from employee complacency or negligence.

Plant activities, vehicle movements and employee work practices with oils and chemicals is governed by the Applicant's Safety Statement and Site-Specific Risk Assessments and Method Statements. These are in place on Site and reviewed regularly. Other controls include automatic fire suppression in certain areas.

Furthermore, plant and equipment are regularly maintained on Site at the appropriate intervals. Vehicles are checked daily for obvious defects by the driver and are regularly serviced and maintained (in accordance with manufacturers' guidance) by a competent person. All maintenance and repairs are only completed by authorised persons. Driver training, traffic management measures and speed limits are in place on site roads to minimise the likelihood of a vehicle accidentally colliding. However, with the implementation of the above management measures for site safety, equipment uses and maintenance, there may still be the potential for employee and operator complacency. Therefore, the overall likelihood rating for the Proposed Development to cause a fire/explosion is Very Unlikely.

Personnel working in external areas of the site could be harmed from these fires and explosions and this could also potentially result in damage to site buildings. Such incidents have the potential to cause more than one fatality, therefore the consequence of this scenario is considered to be greater than Limited and would be Serious**.** Furthermore, environmental contamination would be simple and localised, but may be slightly more extended duration depending on the location of the fire/explosion (e.g., tank or fuel storage area). No anticipated damage or disturbance to the local community.

The overall significance of the potential impact of a major accident or disaster from a fire/explosion event resulting from vehicle collisions, malfunctioning equipment or complacency is considered to be **Low**.

17.7.3.5 Potential cause of contamination of underlying soils and groundwater from fire water run off

All fires on site have the potential to generate fire water from the level of emergency response required. Firewater generation can lead to the contamination of soils, groundwater and surface waters.

There is a low volume of environmental risk materials stored on the Site. There is also a fully trained emergency response team on site. Infrastructure in certain site areas includes fire abatement equipment which if deployed early reduces the overall quantities of fire water or suppression media required. Fire drills and other emergency scenarios are frequently practiced. Therefore, the overall likelihood rating for the Proposed Development to cause a fire water releases is considered to be Very Unlikely.

The release of the firewater would have limited potential for injuries or a fatality, however, there would be a greater potential for environmental contamination. Environmental contamination would be simple and localised, but may be slightly more extended in duration depending on the location of the fire/explosion (e.g., tank or fuel storage area). The release of firewater has potential to impact groundwater supplies, however there is no anticipated damage or disturbance to the local community as a whole. It is considered that the consequences from such release would be Serious.

The overall significance of the potential impact of a major accident or disaster from the release of fire water is considered to be **Low**.

17.7.3.6 Potential to cause contamination of underlying soils and groundwater from fuel, hydrocarbons and chemicals

Diesel is stored on site in tanks and used for power generation and fueling equipment. Chemicals are stored on site for various site process.

During the refuelling operations for plant and other equipment there is the potential for leaks and/or overflow of diesel fuel tanks during filling. Similarly, fuels storage operations can experience leaks and/or overflow, equipment or infrastructure failure, human error or negligence, and pipeline and tank failures. Fuels and hydrocarbons have dedicated bunded storage areas and methods to govern their handling. Fuels are not stored outside of these areas. The KD Environmental Ltd (2021) ELRA notes bund testing occurs every 3 years and there is an emergency response team on site. The tank was considered by KD Environmental Ltd (2021) to be of good condition and separated from other site activity meaning that risk of collision reduced. The ELRA also notes that the bund was hydrostatically tested in 2020 by JC Enviro and passed. Other chemicals are store in bunded areas and within drums. Oils and chemicals drums are supplied by manufacturers of the oils/chemicals and the supplier is required to meet legislation ensuring that they are in good condition and fit for purpose. Oil drums and containers are bunded. Weekly inspection of above ground pipelines is performed by maintenance staff on site. Any spills or drips can also now be quickly spotted as they will fall onto hardstand and the leak quickly repaired

Fuelling and chemical handling activities are carried out by designated members of staff, and the storage of these is effectively managed. It is considered that spillages or releases will be Unlikely to occur in such quantities what will cause significant contamination.

Due to the continued usage, volume checks and the operational management controls (periodic checks and audits of bunds) it is considered that the consequences from such a spillage would be localised and Limited. Such spillages would not result in fatalities. Furthermore, such limited environmental effects would not have off site effects on communities.

The overall significance of the potential impact of a major accident or disaster from a fuel or chemical release is considered to be **Low**.

17.7.3.7 Potential to cause HGV collisions and road traffic accidents

With regards to on site events, the facilitation of private vehicle use on site is limited to the office and car park area. Movements within the working area are routed on defined and maintained haul roads with restricted speed limits.

It should be noted that the Proposed Development does not seek to increase associated HGV journeys and will continue to use existing road access and traffic control measures.

HGVs interact with the public domain and the adjacent road network. During these times there is potential for activities to result in a road collision or incident with a non-motorised member of the public. This may occur as a result of public negligence/error, objects on the road, or the failure of vehicle operators. It is considered that the occurrence of an accident involving a Site HGV is no more likely than typical occurrence of typical road traffic accidents. Furthermore, individual accidents and incidents are not considered to constitute a 'major accident/disaster' for the purposes of this assessment, and therefore this has been disregarded from further assessment.

17.7.3.8 Potential to cause contamination of underlying soils and groundwater from fuel tanker collision resulting in diesel spill

Refuelling operations are carried out by a diesel tanker. Potential major accidents may include the collision of the diesel tanker on site releasing its contents to ground. The tanker has the capacity to contain up to 12,500 litres of diesel fuel. This release may result in the contamination of open ground where the spill occurs leading to soil and groundwater contamination. Fuels entering drains may lead to the contamination of water lagoons.

Driver training, traffic management measures and speed limits are in place on site roads to minimise the likelihood of an accidental vehicle collisions. However, with the implementation of the above management measures there may still be the potential for employee and operator complacency. Therefore, the overall likelihood rating for the Proposed Development to cause a fire/explosion is Very Unlikely.

As with any vehicle collision scenario there is the potential for greater than one fatality depending on the events. Environmental contamination would be simple and localised but may be slightly more extended duration due to the potential large quantity spilled from the tanker. There is no anticipated notable damage or disturbance to the local community. The consequence of this scenario is considered to be greater than Limited and would be Serious.

The overall significance of the potential impact of a major accident or disaster from release of diesel from a tanker following a collision is considered to be **Low**.

17.7.3.9 Potential to gas leaks

There is a GNI distribution line located within the Site, which follows the route of the R179. Based on existing service mapping the proposed construction works for the Cut-and-Cover tunnel under the R179 will be carried out beneath the transmission line. However, as these works are in close proximity communication has been initiated with GNI during the writing of this EIAR. Confirmation of the location of the gas pipe will be undertaken by service scanning and trial digging prior to construction of the tunnel to ensure that there will be no effects on the surrounding GNI infrastructure and supply as well as reducing the risk for accidental contact and breach of the line. Therefore, the overall likelihood rating for the major accidents or disasters to occur from the contact of gas lines during the Proposed Development is Very Unlikely.

Breaches of the gas line have the potential to cause fires should an ignition source be in the vicinity of the leak. With such unexpected fires there is a potential of one fatality depending on the events. Environmental contamination would be limited given the nature of the gas. It is considered that there would be normal

community functioning with some inconvenience. Due to the aforementioned potential for a fatality, the consequence of this scenario is considered to be greater than Limited and would be Serious.

The overall significance of the potential impact of a major accident or disaster from an accidental strike on the gas line is considered to be **Low**.

17.7.3.10 Potential impacts from unplanned explosion

Blasting activities are only to be carried out by appropriately trained and qualified personnel. Strict protocols are used on the Site to govern the use of explosives for extraction. Protocols are in pace to ensure all personnel are away from areas to be blasted. Method statements are produced by the blasting contractor to ensure suitable protocols are defined and adhered to. Further to this monitoring plans are identified and confirm that acceptable thresholds/limits are not exceeded. This monitoring data also allows for control of the blasts as the data can enable the blasting technicians to modify techniques (e.g. charge sizes) as required. It is considered that with the implementation of these management measures, there is adequate control of the risk of explosion from blasting activities, therefore the likelihood of this activity to cause a major accident or disaster is Very Unlikely.

An unplanned explosion incident has the potential to cause more than one fatality, therefore the consequence of this scenario is considered to be greater than Limited and would be Serious.

The overall significance of the potential impact of a major accident or disaster from an unplanned explosion is considered to be **Low**.

17.7.3.11 Potential to cause impacts from unplanned outages and disruption to services, including groundwater pumps and the power systems

The foremost item of Site infrastructure which could have major impact if disrupted for prolonged periods is the pit dewatering pumps. Infrastructure such as these pumps have secondary back up power to prevent situations where pumping ceases without control.

All site equipment will be managed and maintained in accordance with and operational management plan. The dewatering pumps and associated infrastructure will be subject to a preventative maintenance plan, as will the Site's back-up generators which will run the pumps as required. It is considered that primary and secondary power outages may only occur in exceptional circumstances and that such an event is Very Unlikely.

Should these pumps cease and there is uncontrolled rewatering of the pit workings the there is potential is potential for damage to site infrastructure and to pit faces depending on prolonged duration of outage and rewatering. There is a low potential of injury or fatalities given restricted working patterns and assessments following such an event. There would be no anticipated damage or disturbance to the local community. There is potential for Limited environmental effects and contamination, which may present as sulphate contamination within the discharge waters. A number of studies regarding the environmental effects on the emission of waters with elevated sulphate to the River Bursk were conducted following the old Drumgoosat mine subsidence incident in 2018. These studies concluded that there was no toxicological effect on fish and macroinvertebrate populations downstream of the MSE1 emission. A change in the water quality for drinking water abstraction at Tallanstown, Co. Louth did not result after the Drumgoosat mine incident.

The overall significance of the potential impact of a major accident or disaster from outages and disruption to site services, and in particular the dewatering pumps is considered to be **Low**.

17.6.4 Summary of Major Accident and Disaster Risks

Table 17.4 below provides a concise summary of the possible major accidents and disasters associated with the Proposed Development.

Table 17.5 further below identifies where each of the risk scenarios falls within the risk matrix.

Table 17.4: Major accident and disasters risk summaries

	Risk	Potential Cause	Effect	Likelihood Value Table 17.1	Basis of Likelihood	Conseq. Value Table 17.2	Basis of Consequence	Score Value
Vulnerability of the Proposed Development								
1	Vulnerability of the open pit face to seismic events	Natural seismic activity.	Rock fall from the Open Pit face. Potential impact to employees or lands slippage at surface.	Extremely Unlikely (1)	Vulnerability of the surrounding area to seismic events and record of such events as per EPA 2014b.	Serious (3)	Given the potential for greater than one fatality and less than five. No anticipated damage or disturbance to the local community. No anticipated contamination.	Low (3)
2	Vulnerability to aircraft collision	Failure of air traffic control; act of terrorism; human error or negligence.	Injury or fatality; Damage to assets.	Extremely Unlikely (1)	Considered to only occur in exceptional circumstances; limited height of structures on the Site.	Catastrophic (5)	Potential for a significant number of fatalities (>50).	Low (5)
Proposed Development's Potential to Cause								
3	Collapse of open pit face or debris falls	Improper use and deployment of explosives; failure to maintain or manage the integrity of the pit face; and unidentified geotechnical structures	Injury or fatality of personnel in area, including persons on the adjacent public roads; damage to equipment; localised and simple contamination.	Very Unlikely (2)	Geotechnical assessments will be carried out frequently and in accordance with the mine operational management plan and relevant legislation and best practice.	Serious (3)	Given the potential for greater than one fatality and less than five, and also the scale of the workings and number of personnel. No anticipated damage or disturbance to the local community. Limited potential for contamination, but effects would be localised.	Low (6)

	Risk	Potential Cause	Effect	Likelihood Value	Basis of Likelihood	Conseq. Value	Basis of Consequence	Score Value
4	Sinkholes	Sinkholes under the adjacent public roads.	Damage to roads. Potential injury or fatality of road users. Potential impact to environmental receptors due to damage of adjacent infrastructure including gas lines, electricity, local water resources.	Unlikely (3)	Extensive site investigation and assessment of subsidence events and underlying geology; remediation measures undertaken and monitoring measures in place	Serious (3)	Given the potential for greater than one fatality and less than five. Normal community functioning with some inconvenience of road closures. Limited potential for contamination, but effects would be localised.	Moderate (9)
5	Sinkholes	Sinkholes under overlying agricultural lands	Damage to overlying land and agricultural resource. Although extremely unlikely there is potential impact of injury or loss of life to persons who may be working lands in the vicinity of the sinkhole during the collapse.	Unlikely (3)	Extensive site investigation and assessment of subsidence events and underlying geology; remediation measures undertaken.	Limited (2)	Limited potential for injuries or a fatality. Any environmental effects would be localised. Damage would be to the overlying land value and disturbance to agricultural activity. No anticipated damage or disturbance to the local community.	Low (6)
6	Fire / explosion	Vehicle collision; failure of equipment or infrastructure at oil or chemical storage area; employee complacency or negligence.	Damage to vehicles, equipment, tanks and/or bunds; injury or fatality; localised and simple contamination.	Very Unlikely (2)	Level of management governance, protocols and practices in place.	Serious (3)	Limited potential for injuries or a fatality. Environmental contamination would be simple and localised, but may be slightly more extended duration depending on the location of the fire/explosion (e.g., tank or fuel storage area). No anticipated damage or disturbance to the local community.	Low (6)

	Risk	Potential Cause	Effect	Likelihood Value	Basis of Likelihood	Conseq. Value	Basis of Consequence	Score Value
7	Fire water contamination	Fire water generation from response team or emergency services attending to a site.	Generation of firewater contaminated pollutants which could result in harm to the environment such as soil and water contamination.	Very Unlikely (2)	Level of management governance, protocols and practices in place.	Serious (3)	Limited potential for injuries or a fatality. Environmental contamination would be simple and localised, but may be slightly more extended duration depending on the location of the fire/explosion (e.g., tank or fuel storage area). No anticipated damage or disturbance to the local community.	Low (6)
8	Fuel, other hydrocarbon, or chemical spillages, leaks and releases	Spillage, leaks and/or overflow of diesel fuel tank or mobile plant during tank filling. Failure of Bund Releasing Oils and Chemicals. Corrosion of Drums Releasing Oils and Chemicals. Pipeline, tank and other equipment/infrastructure failure. Human error or negligence	Contamination of ground water, surface water and land. Contamination of open ground surrounding hard standing at the storage bund, migration of oils and chemicals to groundwaters, contamination of stormwaters in settlement lagoons / discharge to the River Bursk.	Unlikely (3)	Level of management practices and audit provision proposed to be in place.	Limited (2)	Environmental contamination would be simple and localised. No anticipated damage or disturbance to the local community. No anticipated potential for fatalities or injury.	Low (6)

	Risk	Potential Cause	Effect	Likelihood Value	Basis of Likelihood	Conseq. Value	Basis of Consequence	Score Value
9	Collision on site releasing diesel tanker contents (tankers may contain up to 12,500L of fuel)	Vehicle collision; failure of equipment; driver or public complacency or negligence	Damage to vehicles equipment, injury or fatality of employee or public, localised and simple contamination as a result of the damaged vehicles.	Very Unlikely (2)	Overall site Traffic management plan; Designed of road access and routes; speed limits in place; Use of mobile phone prohibited on site when driving.	Serious (3)	Potential for greater than one fatality depending on the collision scenario. Environmental contamination would be simple and localised, but may be slightly more extended duration due to the quantity spilled. No anticipated notable damage or disturbance to the local community.	Low (6)
10	Gas leaks and fire	Potential to cause a fire on site should an ignition source be in the vicinity of the leak.	Injury or fatality; Damage to assets.	Very Unlikely (2)	Level of management governance, protocols and practices in place.	Serious (3)	Potential for greater than one fatality depending on the gas leak scenario.	Low (6)
11	Unplanned explosion	Uncontrolled explosion due to error in blast management; Human error or negligence.	Injury or fatality; Damage to assets.	Very Unlikely (2)	Level of management governance, protocols and practices in place.	Serious (3)	Potential for greater than one fatality depending on the blasting scenario.	Low (6)

	Risk	Potential Cause	Effect	Likelihood Value	Basis of Likelihood	Conseq. Value	Basis of Consequence	Score Value
12	Uncontrolled rewatering of open pit	Disruption of primary and secondary power sources.	Damage to infrastructure; potential damage to pit faces depending on prolonged duration of outage and rewatering.	Very Unlikely (2)	Operation control; secondary back-up power generators, preventative maintenance plan and schedule for the pumps, and their primary and secondary power.	Limited (2)	Low potential of injury or fatalities given restricted working patterns and assessments following the event. No anticipated damage or disturbance to the local community. Limited potential for sulphate contamination of discharge water as demonstrated by previous studies of the 2018 subsidence event.	Low (4)

Table 17.5: Matrix for determining significance of effect

		Consequence				
		1 Minor	2 Limited	3 Serious	4 Very Serious	5 Catastrophic
Likelihood	5 Very Likely					
	4 Likely					
	3 Unlikely		5, 8	4		
	2 Very Unlikely		12	3, 6, 7, 9, 10, 11		
	1 Extremely Unlikely			1		2
DoEHLG 2010 Classification		Normal Emergency		Major Emergency		

In accordance with the DoEHLG 2010 classification risks No. 1, 2, 3, 4, 6, 7, 9, 10 and 11 are deemed to be 'Major Emergencies'. Risks No. 5, 8 and 12 have been identified within the 'Normal Emergency' zone of the matrix table. The scenario with the highest risk score is No. 4: the potential for the Proposed Development to cause sinkholes under the adjacent public roads.

With regards to the 'Major Emergencies', the DoEHLG 2010 guidance identifies that the extremities of the major emergencies can be delineated in two specific areas. For higher risk scenarios the prevention and mitigation of hazards is required; such hazards were not identified in this assessment. For major emergencies with a lower likelihood, they have identified a disaster and extendibility area. These hazards are extremely or very unlikely and the DOEHLG note they do not therefore warrant specific preparedness but can be responded to by extending the inter-agency arrangements of the major emergency regime. Given the extreme unlikelihood of scenarios 1 and 2 occurring, SGMI have not included such provisions in their site management plans. Communication and initial response in these earthquake and aircraft collision scenarios will be overseen in accordance with the SGMI Emergency Response plan, however the main emergency management will be coordinated by external bodies such as An Garda Síochána, the Health Service Executive and other appropriate authorities.

The remaining identified 'Major Emergencies' (3, 4, 6, 7, 9, 10 and 11) fall within the DoEHLG 2010 'Planning and Preparedness' zone. The management of such will be managed in accordance with the SGMI Emergency Response plan. The Site's emergency response procedures (Appendix 3.9) contain a number of underground mining emergency provisions as well as procedures for:

- Serious injury or medical emergency underground;

- Inrush of water or fluidised material underground;
- Fire on surface; and
- Bomb threat.

All personnel on site receive training in the Site's emergency response procedures. The training ensures that all staff are aware of their responsibilities during such emergency events. These staff participate in regular emergency training exercises. Select staff undergo training in emergency critical roles, these include personnel trained to use fire suppression systems and roles relating to the emergency response team present on site.

17.7 'Do-Nothing' Scenario

In the 'Do-Nothing scenario' Knocknacran Mine would be restored as outlined in the existing permitted restoration plan (Reg. Ref 17/217) which allows for the reinstatement of agricultural land at the site and for the creation of a lake within the former open-cast area. A viewing area would be created to the west of the site where the local community or tourists may use the newly created amenity area for recreational use.

In the 'Do-Nothing scenario' for the Community Sports Complex, the phase 1 development (Reg. Ref. 20/365) would continue to operate onsite with no further development.

In the event that the Proposed Development does not proceed, the risk of major accidents and disasters would reduce on site, in that the events associated with the operation would be removed.

17.8 Mitigation and Monitoring

The Proposed Development has been designed and will be operated in line with the relevant best international current practice and, as such, mitigation against the risk of major accidents and disasters will be embedded through the design and management. Construction activities will be managed in accordance with a Construction Environmental Management Plan (CEMP).

Planning and preparedness measures for the Site are sufficient and TARP monitoring will continue as agreed with the authorities. Measures will be reviewed in consultation with the authorities by SGMI and updated as required.

As noted the scenario with the highest risk score is No. 4: the potential for the Proposed Development to cause sinkholes under the adjacent public roads. Mitigation and monitoring measures for this scenario have been discussed in Section 17.7.3.2.

Emergency response provision will be maintained on Site and updated accordingly with the Site's management practices. SGMI's emergency response planning will cover all foreseeable risks on site. Appropriate training for site personnel will be maintained, including the incident and rescue teams, as well as first aiders and fire marshals. In addition, appropriate staff will be trained in environmental issues and spill response procedures.

17.9 Mine Closure

Appendix 3.3 of this EIAR presents the Closure, Restoration and Aftercare Management Plan (CRAMP), which sets out details of the closure and aftercare vision for the Application Site. The plan will continue to be developed in line with Saint-Gobain's Stakeholder Management Plan taking community and statutory interests into account. The risk of major accidents and emergencies to arise following closure of the mine will continue to be managed through the actions identified in the CRAMP.

17.10 Residual Effects

With the maintenance of the relevant management protocols and practices the risk of a major accidents and disasters during the construction and operation of the Proposed Development is considered to be acceptable. It is considered that residual effect from the construction and operation of the Proposed Development will be **Not Significant**.

17.11 Cumulative Effects

17.11.1 The Project – Community Sports Complex and Mine Development

The construction phases of the Community Sports Complex and the Mine Development occur simultaneously, however, no significant effects are identified for either and it is considered that there is no potential for cumulative effects between the two developments.

The construction phase of the Community Sports Complex overlaps with the first year of the operational life of the Mine Development, however, no significant effects are identified for either and it is considered that there is no potential for cumulative effects between the two developments.

The operational phase of the Community Sports Complex and Mine Development overlap, however, no significant effects are identified for either and it is considered that there is no potential for cumulative effects between the two developments.

The restoration phase of the Mine Development overlaps with the operational phase of the Community Sports Complex, however, no significant effects are identified for either and it is considered that there is no potential for cumulative effects on land, soils and geology between the two developments.

17.11.2 The Project and Other Offsite Projects

The nearest extractive industries to the Knocknacran West Mine are Knocknacran Mine and Drummond Mine, to the south. Knocknacran Mine will be restored with material from Knocknacran West Mine and it is not considered that there will be a cumulative effect that could result in a major accident or disaster between the two mines as only one will be actively mined throughout the life of the Proposed Development.

Drummond Mine is permitted to 2032 and while it may be operational during part of the life of Knocknacran West Mine, there will be no direct connection between the two mines. The development of the Knocknacran West Mine will remove underground workings at the former Drumgoosat Mine and also provide additional materials to further restore Knocknacran Mine. This will have the effect of further isolating the Drummond Mine Underground workings from the proposed Knocknacran West Mine. The proposed and existing mines will not interact with the proposed Community Sports Complex development, there are no workings beneath the development and there is no direction interaction required, therefore, there is no potential cumulative effect.

Other extractive industries near to the Application Site include four operational quarries within a radius of 5 km of the proposed development. These are; (i) Cormey Clay Pit, Breedon Brick Ltd.'s open-cast clay quarry, located ca. 1.5 km south of the Site. (ii) an associated site located ca. 4 km south of the Site, (iii) Limestone Industries Ltd limestone quarry, located ca. 2 km west of the Site, and (iv) Roadstone Barley Hill open-cast quarry located ca. 4 km southeast of the Site. As these facilities are not within the immediate vicinity of the Site (ca. 1 km), there will be no cumulative effect that could be attributed to the interaction of several extractive industries in close proximity to each other.

Losset ADN Materials Ltd. have a planning application under consideration (Reg. Ref. 22/254) and are located ca. 1 km to the north of the Project site. Based on a review of the current planning file data (to date 10th February 2023), this development is not a type which could interact with the Proposed Development. There will be no cumulative effect on the soils and geology environment due to this development.

Other existing developments in the area include a mushroom farm, chicken farm, school and industrial/commercial facilities (e.g. car dealership). There will be no cumulative effect between the Project and these developments.

The cumulative effects are deemed **Not Significant** between the Project and other offsite Projects.

17.12 Difficulties Encountered

There were no particular difficulties encountered during the production of this chapter of the EIAR.

17.13 References

- Department of Housing, Local Government and Heritage (2006) 'A framework for major emergency management'. Available at: https://www.gov.ie/en/collection/ca182-a-framework-for-major-emergency-management/# (Accessed: 08 March 2023).
- Department of Housing, Local Government and Heritage (2010) 'A Framework for Major Emergency Management - Guidance Document 1: A Guide to Risk Assessment in Major Emergency Management'. Available at: https://assets.gov.ie/180173/50f752fc-907d-4823-b386-112627efe8c9.pdf (Accessed: 08 March 2023).
- Environmental Protection Agency (2014a) 'Guidance on assessing and costing environmental liabilities'. Available at: https://www.epa.ie/publications/compliance--enforcement/licensees/reporting/financial-provisions/EPA_OEE-Guidance-and-Assessing-WEB.pdf (Accessed: 08 March 2023).
- Environmental Protection Agency (2014b) 'Environmental Impacts of Unconventional Gas Exploration and Extraction (UGEE) 2014-W-UGEE-1, Summary Report 2: Baseline Characterization of Seismicity'. Available at: https://www.epa.ie/publications/research/ugee-joint-research-programme/EPA---UGEE-SR2_web.pdf (Accessed: 08 March 2023).
- Environmental Protection Agency (2015) 'Advice Notes for Preparing Environmental Impact Statement - Draft'.
- Environmental Protection Agency (2022) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports'. Available at: https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf (Accessed: 08 March 2023).
- European Commission (2017) Environmental impact assessment of projects: guidance on the preparation of the environmental impact assessment report (Directive 2011/92/EU as amended by 2014/52/EU). LU: Publications Office. Available at: https://data.europa.eu/doi/10.2779/41362 (Accessed: 08 March 2023).
- European Council (2003) 'Directive 2003/4/EC of the European Parliament and of the Council on public access to environmental information and repealing Council Directive 90/313/EEC'. Available at: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:041:0026:0032:EN:PDF (Accessed: 08 March 2023).
- European Council (2009) Directive 2009/31/EC of the European Parliament and of the Council on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006, 140. Available at: http://data.europa.eu/eli/dir/2009/31/oj/eng (Accessed: 08 March 2023).
- European Parliament and European Council (2012) 'Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC Text with EEA

relevance'. Official Journal of the European Union. Available at: http://data.europa.eu/eli/dir/2012/18/oj/eng (Accessed: 08 March 2023).

- European Union (1985) 'Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment'. OPOCE. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:31985L0337&from=EN (Accessed: 08 March 2023).
- European Union (2011) 'Directive 2011/92/EU of the European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment'. Official Journal of the European Union. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011L0092&from=EN (Accessed: 08 March 2023).
- European Union (2014) 'Directive 2014/52/EU of the European Parliament and of the Council, amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment'. Official Journal of the European Union. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0052&from=EN (Accessed: 08 March 2023).
- Golder Associates Ireland Ltd (2019) 'Knocknacran West Pit Slope Stability Preliminary Assessment report'.
- Health and Safety Authority (2020) Safe Quarry - Guidelines to the Safety, Health and Welfare at Work (Quarry) Regulations 2008. Available at: https://www.hsa.ie/eng/publications_and_forms/publications/mines_and_quarries/safe_quarry_regs_2020.pdf (Accessed: 08 March 2023).
- Highways England (2020) 'Design Manual for Roads and Bridges: LA 104 - Environmental assessment and monitoring'. Available at: https://www.standardsforhighways.co.uk/prod/attachments/0f6e0b6a-d08e-4673-8691-cab564d4a60a?inline=true (Accessed: 08 March 2023).
- IEMA (2020) 'Major Accidents and Disasters in EIA: An IEMA Primer'. Available at: https://www.iema.net/resources/reading-room/2020/09/28/major-accidents-and-disasters-in-eia-an-iema-primer (Accessed: 08 March 2023).
- Irish Statute Book (2000) 'Planning and Development Act'. Office of the Attorney General. Available at: http://www.irishstatutebook.ie/eli/2000/act/30/enacted/en/html (Accessed: 08 March 2023).
- Irish Statute Book (2001) 'S.I. No. 600/2001 - Planning and Development Regulations'. Office of the Attorney General. Available at: http://www.irishstatutebook.ie/eli/2001/si/600/made/en/print (Accessed: 08 March 2023).
- Irish Statute Book (2015) 'S.I. No. 209/2015 - Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations'. Office of the Attorney General. Available at: https://www.irishstatutebook.ie/eli/2015/si/209/made/en/print (Accessed: 08 March 2023).
- Irish Statute Book (2018) 'S.I. No. 296 of 2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations'. Office of the Attorney General. Available at: http://www.irishstatutebook.ie/eli/2018/si/296/made/en/print (Accessed: 08 March 2023).

- KD Environmental Ltd (2021) 'Saint-Gobain Monitoring (Ireland) Ltd, Magheracloone, Carrickmacross, Co. Monaghan - Environmental Liabilities Risk Assessment'. Report date: 08 April 2021.
- SRK Consulting (UK) Ltd (2018) 'Drumgoosat Subsidence Event – Technical Report'.
- SRK Consulting (UK) Ltd (2019a) 'Drumgoosat L4900 Monitoring Trigger Action Response Plan (TARP)'.
- SRK Consulting (UK) Ltd (2019b) 'Knocknacran West Mine Assessment, Ireland'.
- SRK Consulting (UK) Ltd (2020) 'Drumgoosat Underground Mine – Investigation and Analysis of Mine Stability Below the R179 Road'.
- Wardell Armstrong LLP (2018) 'Department of Communications, Climate Action and Environment – Investigation of the collapse of workings at Drumgoosat – An independent review of the works completed by SRK. Report Number: R007'. Available at: https://assets.gov.ie/86978/aa8a543b-1e4a-4139-b4e7-3f8f14af83b8.pdf (Accessed: 08 March 2023).

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APPENDIX

18.0 INTERACTIONS & COMBINED EFFECTS

18.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) has been prepared by SLR Consulting Ireland Ltd. (SLR) on behalf of Saint-Gobain Mining (Ireland) Ltd. ('SGMI' or 'Saint-Gobain'), who are submitting a planning application to Monaghan County Council. A summary of the proposed activities (the Proposed Development, both the Mine Development and the Community Sports Complex) is as follows:

- Excavation of the former (Drumgoosat) underground mine by open-cast mining methods for the purposes of gypsum extraction at Knocknacran (East & West) and Drumgoosat, Co. Monaghan. Development will include the construction of a Cut-and-Cover Tunnel under the Carrickmacross to Kingscourt regional road (R179) for the transport of gypsum (by haulage truck and covered conveyor) to the existing processing plant area at Knocknacran, and for the transport of overburden and interburden (by haulage truck) to the existing Knocknacran Open-Cast Mine site for ongoing restoration purposes. The construction of the proposed tunnel will necessitate a temporary realignment of the R179 during the tunnel construction period to allow the R179 to remain in constant use. Development will also include: the demolition of one residential house and three unoccupied houses and sheds in the townlands of Knocknacran (East & West), Co. Monaghan; and the pumping of water from the existing Drumgoosat underground workings via an existing borehole on the Knocknacran West Mine site.

- The continued ongoing restoration of the existing Knocknacran Open-Cast Mine located in the townlands of Derrynascobe, Derrynaglah, Enagh, Knocknacran (East & West) and Drummond, Co. Monaghan, permitted under Reg. Ref. 17/217 and operating subject to Industrial Emissions (IE) Licence P0519-04 and Mining Lease M139. The proposed development includes a modification to the existing (approved) restoration plan to return the existing Knocknacran Open-Cast Mine to near ground levels.

- The continuation of use and refurbishment of the existing Knocknacran Processing Plant area, including water treatment facilities and associated infrastructure (including discharge pipeline to the River Bursk) in the townlands of Enagh, Derrynaglah, Drummond, Derrynascobe and Clontrain, Co. Monaghan.

- The Proposed Development will include a replacement vehicular access to the existing Knocknacran Open-Cast Mine and Knocknacran Processing Plant area site from the L4816.

- The further development of a Community Sports Complex (permitted under Reg. Ref. 20/365) located in the townlands of Drummond, Derrynaglah and Knocknacran West, Co. Monaghan which provided for a playing pitch, dressing rooms, welfare facilities, parking and associated drainage/wastewater infrastructure. This proposed development includes the next phase of the Community Sports Complex to include: 2 no. further playing pitches (one with perimeter running track and the other is an all-weather pitch) with associated goal posts, ball stops, dugouts, pitch fencing, flood lighting; a new building to incorporate reception, meeting / club rooms, sports hall, handball alley, changing rooms and toilets, viewing gallery; a part covered grandstand and additional parking and all associated siteworks.

This chapter of the EIAR describes interactions/inter-relationships between environmental effects and impacts of the Proposed Development with other appropriate committed development in the area surrounding the Proposed Development.

The assessment directly covers the physical extent of the EIAR study boundary as shown in Figure 18.1. A 1 km buffer area around the Application Site is shown for context.

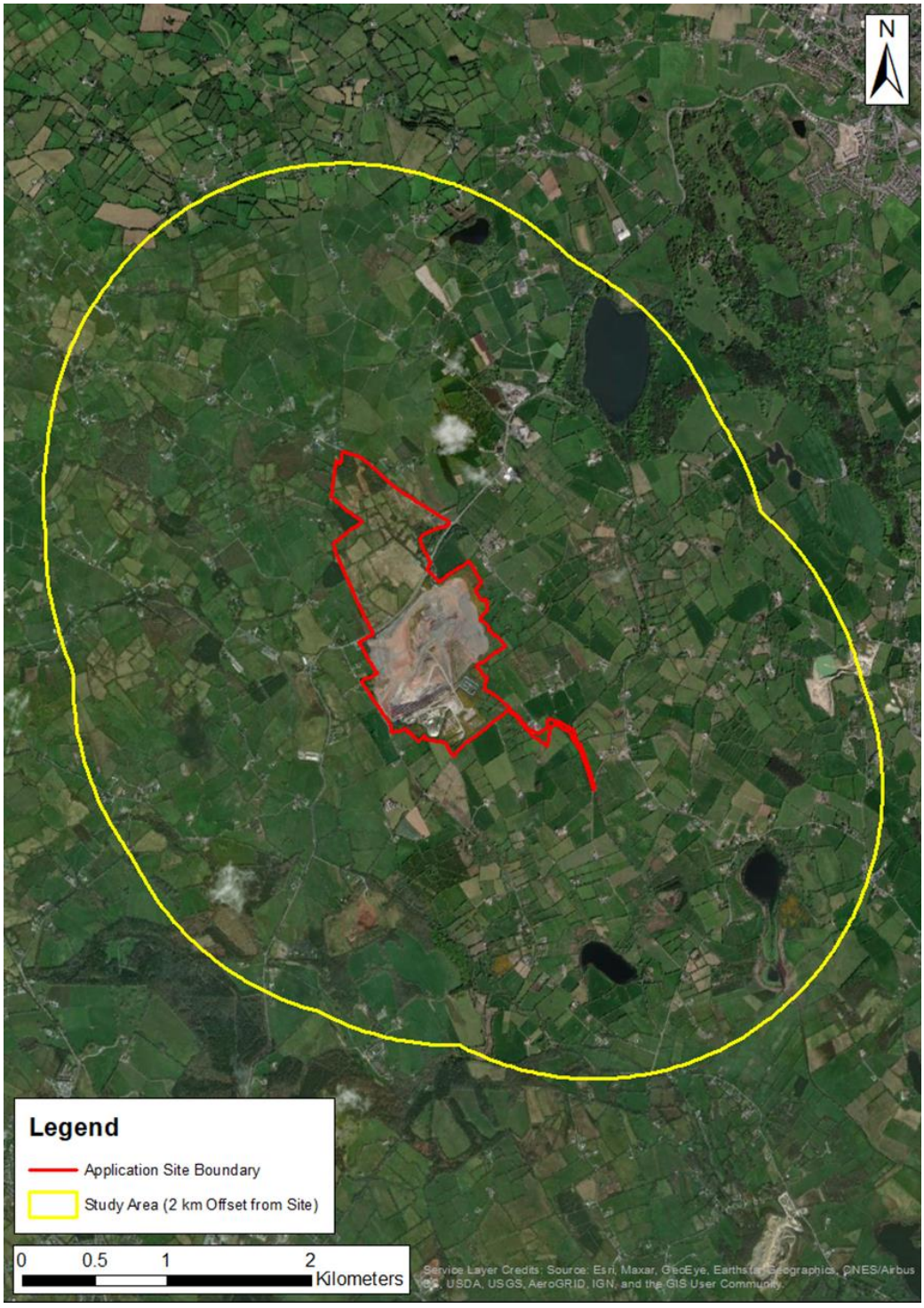

Figure 18.1: EIAR Study Boundary Area

Environmental factors are inter-related to some degree, and these interactions can exist on many levels. The main interactions and impacts between the scoped environmental disciplines have been assessed in the EIA process and are documented within the individual chapters of this EIAR. This chapter summarises the primary interactions between the environmental topics and provides a matrix to coherently display them.

Cumulative effects are defined as the addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects. Singular activities may have a minor effect in isolation, however when combined with other impacts these can be collectively significant and therefore must be included in the EIA process. A review has been carried out to identify where other proposed and committed development in proximity to the Proposed Development may result in an accumulation of effects on particular receptors.

The overall objective of the assessment in this chapter is to identify the key areas where interactions occur in order to identify whether additional mitigation is required that would not otherwise have been identified in the individual study areas for these interacting effects.

The overall EIAR Project Team contributed to the compilation of this chapter.

18.2 Methodology

The environmental impact assessment of the Proposed Development has been made with regard to the 'Guidelines on the information to be contained in Environmental Impact Assessment Reports', published by the EPA (2022); and the 'Draft Advice Notes for Preparing Environmental Impact Statements', (September 2015). The guidelines were drafted by the EPA with a view to facilitating compliance with EIA Directive (2014/52/EU). The Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018), was also considered in this assessment.

The descriptive terminology used follows a 'matrix approach' to environmental assessment which is based on the characteristics of the impact (magnitude and nature) and the value (sensitivity) of the receptor. The terminology and method have been summarised in Chapter 2.0 of this EIAR.

For the assessment of interacting effects, a matrix has been provided in Table 18.1 identifying, through professional judgment, the specific topics within the EIAR where the effects potentially interact/inter-relate with each other.

18.3 Interactions

Table 18.1 identifies the interacting disciplines which are then discussed in further in the following sections. The green shading identifies the areas where potential interaction, and in-combination effects, between topic areas might arise.

Table 18.1: Environmental Interactions arising from Proposed Development

	Pop. & Human Health	Biodiversity	Land, Soils & Geology	Water	Climate	Air Quality	Noise	Vibration	Landscape & Visual	Traffic & Transport	Archaeology & Cultural Heritage	Material Assets
Pop. & Human Health												
Biodiversity												
Land, Soils & Geology												
Water												
Climate												
Air Quality												
Noise												
Vibration												
Landscape & Visual												
Traffic & Transport												
Archaeology & Cultural Heritage												
Material Assets												

Population and Human Health

The Proposed Development has the potential to cause interacting effects between the surrounding population and human health and water, air quality, climate, noise, vibration, traffic and transport, landscape and visual, and material assets.

Potential effects to the human environment from the Proposed Development activities include potential impacts on water which may affect groundwater quality and quantity in local wells (for the Mine Development). Potential impacts to human health can arise if appropriate measures to mitigate air quality impacts are not implemented. Proper safeguarding measures have been incorporated into the design and operation of the Proposed Development, recognising the potential for emissions to land, soils and water receptors. The management of noise and vibration sources associated with the Proposed Development takes account of the potential for direct effects to site workers as well as nuisance and annoyance to surrounding residential receptors. Proper management of traffic, in particular HGV movements, is required to mitigate any potential nuisance and delays to local residents and other users of the wider road network.

Visual impacts from the Proposed Development relate to the effect on views and on the general visual amenity experienced by people, in particular, local residents.

Unconsidered and inappropriate construction activities and increased resource consumption arising from the any new development have the potential to impact or cause disruption to local utilities and to contribute to a cumulative effect on climate change.

The relevant overlaps are set out in the following chapters of this EIAR: Chapter 5.0 – Population and Human Health, Chapter 7.0 – Land, Soils and Geology, Chapter 8.0 – Water, Chapter 9.0 – Climate, Chapter 10.0 – Air Quality, Chapter 11.0 – Noise, Chapter 12.0 – Vibration, Chapter 13.0 – Landscape and Visual, Chapter 14.0 – Traffic and Transport, and Chapter 16.0 – Material Assets.

Biodiversity

There is potential for interacting effects between biodiversity and land, soils and geology, water, air quality, noise and vibration and landscape and visual.

Improperly planned development would have an adverse impact to the soil, water and air environment and have the potential to deteriorate habitat quality both on and off-site. Significant climate change impacts would have the potential to cause knock-on biodiversity impacts. Biodiversity features are interconnected with the landscape features associated with the development, creating interactions between the disciplines.

Noise and vibration generated by the Proposed Development have a potential for impacts to biodiversity and habitats associated with the Application Site.

Where appropriate, these interactions have been considered in the relevant chapters of this EIAR: Chapter 6.0 – Biodiversity, Chapter 7.0 – Land, Soils and Geology, Chapter 8.0 – Water, Chapter 9.0 – Climate, Chapter 10.0 – Air Quality, Chapter 11.0 – Noise, Chapter 12.0 – Vibration and Chapter 13.0 – Landscape and Visual.

Land, Soils and Geology

The mining activity and changes to buildings associated with the Mine Development creates the potential for interacting effects between land, soils and geology, biodiversity, water and archaeology and cultural heritage.

Changes to land use and excavation of materials have potential implications for the ground and surface water environment for the Mine Development. Changes to land and soils also have the potential to cause impacts such as habitat fragmentation and disturbance to ecological features.

These interactions have been considered in the EIAR in: Chapter 6.0 – Biodiversity, Chapter 7.0 – Land, Soils and Geology and Chapter 8.0 – Water. Chapter 15.0 identifies the potential for archaeological and cultural heritage features to be effected by the changes to land, soils and geology arising from the Proposed Development.

Water

Water impacts have the potential for interaction between human health, biodiversity, land, soils and geology and climate.

Changes to the groundwater and surface water regime have potential to impact how land in the area drains. The hydrological network is inherently linked with biodiversity and ecological receptors, for example through providing habitats and foraging sources. Were there to be adverse impacts to water and drainage, potential could arise to cause adverse population impacts, such as increasing the risk of flooding of properties and consequent human health impacts. Should increased water demand arise, this would have the potential to adversely impact on water supply to local properties. The effects of climate change have potential to cause impacts to water management regimes, which has previously impacted on ground conditions.

These interactions have been considered in the EIAR in: Chapter 5.0 – Population and Human Health, Chapter 6.0 – Biodiversity, Chapter 7.0 – Land, Soils and Geology, Chapter 8.0 – Water, Chapter 9.0 – Climate and Chapter 16.0 – Material Assets.

Specifically, the interacting effects between water and land, soils and geology which are particularly pertinent to the Proposed Development have been examined in depth in Chapter 7.0 and Chapter 8.0 of this EIAR and they have been integral to the design evolution of the Proposals.

Climate

Climate interactions have been identified with population, biodiversity, water, air, traffic and transport and material assets impacts.

The effects of climate change have the potential for impacts to human property and loss of habitats for sensitive species. Air quality could be compromised by increased dust during hotter periods, hence the importance of considering the potential for interactions of effects and designing suitable mitigation measures from the outset. Similarly, water management may need to respond to changes to weather patterns and this is an important consideration in terms of the interacting effects between the topic areas of climate and water. Visual features could be altered by failure of plant species and thriving of non-native species. Traffic and transport patterns can contribute to Greenhouse Gas emissions that cause climate change and consumption patterns of utilities are linked to both cause and effect of climate change.

The interactions between the potential impacts of climate change and other environmental topic areas have been examined in Chapter 9.0 of this EIAR.

Air Quality

The Proposed Development creates the potential for interacting effects between air quality, population, biodiversity, climate, landscape and visual and traffic and transport impacts.

Poor air quality can have detrimental effects on human health and sensitive ecological receptors. Air emissions such as CO_2 are major contributors to climate change. Key landscape features such as mature trees are integral to maintaining good air quality and soil cover acts as a carbon sink. Traffic is a well-known contributor to air quality deterioration.

Where these arise, interactions of effects have been considered in Chapter 5.0 – Population and Human Health, Chapter 6.0 – Biodiversity, Chapter 9.0 – Climate, Chapter 10.0 – Air Quality, Chapter 13.0 – Landscape and Visual and Chapter 14.0 – Traffic and Transportation.

Noise

There is potential for interacting effects between noise and population and human health, biodiversity, traffic and transport and archaeology and cultural heritage impacts.

Impacts from excess noise and generated by the Proposed Development may result in nuisance to humans and ecological species. Traffic movements are a source of potential noise impacts. Noisy environments can cause disturbance to the setting of cultural heritage features.

These interactions have been considered in the relevant chapters of this EIAR: Chapter 5.0 – Population and Human Health, Chapter 6.0 – Biodiversity, Chapter 14.0 – Traffic and Transport and Chapter 15.0 – Archaeology and Cultural Heritage.

Vibration

There is potential for interacting effects between vibration and population and human health, biodiversity, traffic and transport, archaeology and cultural heritage, and material assets.

Should excessive vibration be generated by the Mine Development it could result in nuisance to humans and ecological species. Excessive vibration impacts could also cause damage to cultural heritage features and to the integrity of local utility infrastructure. Traffic can be a source of vibration impacts.

These interactions have been considered in the relevant chapters of this EIAR: Chapter 5.0 – Population and Human Health, Chapter 6.0 – Biodiversity, Chapter 14.0 – Traffic and Transport, Chapter 15.0 – Archaeology and Cultural Heritage and Chapter 16.0 – Material Assets.

Landscape and Visual

The Proposed Development has the potential to cause interacting effects between landscape and visual impacts and population and human health, biodiversity, land and soils, water, air quality, climate, traffic and transport, archaeology and cultural heritage and material assets.

Landscape and visual features are often an important habitat for biodiversity features. Changes to landform can have impacts on views and can cause long term landscape changes. Water features are often key assets in terms of landscape and visual settings. Climate and air quality impacts have the potential to cause detrimental changes to elements of landscape such as through the lack of ability for plants to thrive. Transport infrastructure requirements can cause imposition on landscapes and views. Landscape and cultural heritage features often coincide and the value of cultural features is closely linked to setting. Infrastructure associated with utilities and material assets can cause impacts to landscape and visual features.

The main interactions between landscape and visual impacts are set out in Chapter 13.0 of this EIAR.

Traffic and Transport

There is potential for interacting effects between traffic and transport and population and human health, climate, air quality, noise, vibration and landscape and visual impacts.

Excessive traffic can cause nuisance to local residents and create air emissions which are adverse to human health and climate change. Traffic can be a source of noise and vibration, which can also cause nuisance.

The assessments contained within Chapter 5.0 – Population and Human Health, Chapter 9.0 – Climate, Chapter 10.0 – Air Quality, Chapter 11.0 – Noise, Chapter 12.0 – Vibration and Chapter 13.0 – Landscape and Visual examine the interacting effects which have potential to arise between traffic and other impacts.

Archaeology and Cultural Heritage

Potential interacting effects arise between archaeology and cultural heritage and air quality, noise and vibration, and landscape and visual impacts.

Chapter 15.0 sets out the features of archaeology and cultural heritage that have potential to be impacted by such interactive effects. No features have been identified therefore the potential for interacting effects is limited.

Material Assets

The Proposed Development has the potential to cause interactions between impacts on material assets and population and human health, water, climate, vibration and landscape and visual impacts.

Material assets represent a resource for local populations in terms of utility supply and any disruption would have an impact on them. Resource consumption and availability of supply are important considerations in terms of both mitigating against and adapting for climate change and this has been considered in Chapter 9.0 – Climate and Chapter 16.0 – Material Assets. The potential for damage to property and services is covered in Chapter 12.0 – Vibration. Chapter 13.0 – Landscape and Visual explores how the land use changes arising from the Proposed Development effect the local population and landscape receptors.

18.4 Cumulative and Combined Effects

This section of the EIAR describes the environmental effects of the Proposed Development in combination with other relevant committed development in the surrounding area of the Site. Cumulative effects are defined as the addition of many non-significant or significant effects, including the effects of other projects, to create larger, more significant effects. Singular activities may have a non-significant effect in isolation, however when combined with other effects these can be collectively significant.

This assessment has been made with reference to the draft the 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports', (EPA 2022) and the draft 'Advice Notes for Preparing Environmental Impact Statements', (EPA 2015).

Error! Reference source not found. shows the largest industrial uses within a 5 km radius of the Application S ite that, with the Proposed Development, could have the potential to cause cumulative impacts. The EIA team's respective discipline leads have considered these nearby facilities and have not identified the potential for combined effects. There are no large-scale planning applications or recently permitted developments within the 5 km radius identified below. A recent planning permission has been granted for a new Community Centre within Drumgoosat Village to the north of the Application Site. The traffic assessment (as detailed in Chapter 14.0 of this EIAR) has taken the expected traffic to be generated from this reasonably foreseeable development into account and has concluded that there is sufficient capacity for both developments in addition to existing background traffic in the region.

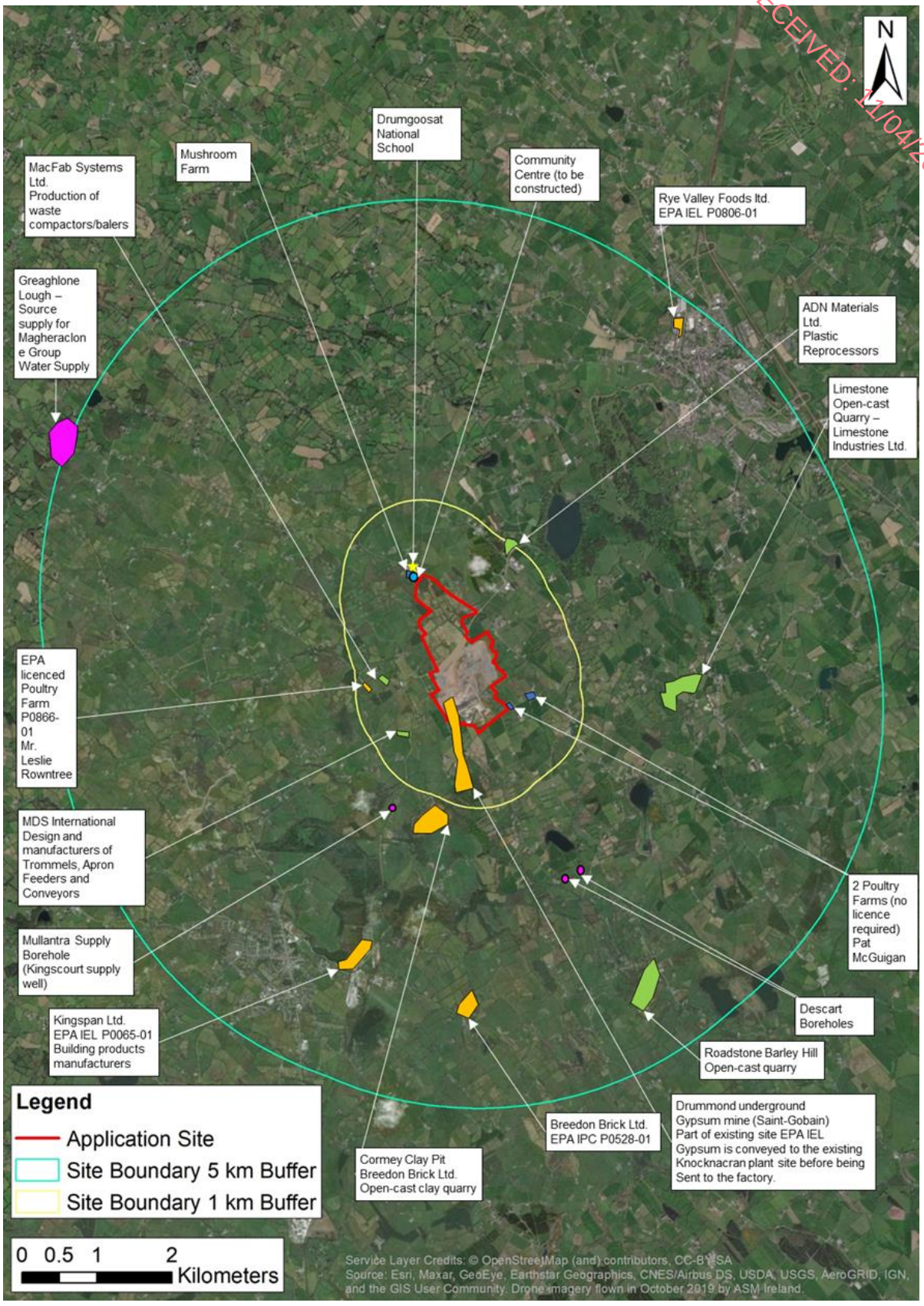

Figure 18.2: Committed Developments surrounding the Application Site

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19.0 MITIGATION AND MONITORING MEASURES

19.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) has been prepared by SLR Consulting Ireland Ltd (SLR) on behalf of Saint-Gobain Mining (Ireland) Ltd. ('SGMI' or 'Saint-Gobain') to support a planning application for mineral extraction, processing, restoration of land post-mining, community sports complex development, and demolition of one residential house and three unoccupied houses and sheds. The Application Site is located ca. 7 km north of Kingscourt and ca. 7 km south of Carrickmacross, along the R179.

The design of the Proposed Development takes environmental constraints and considerations into account and has embedded mitigation as a fundamental component of the design that enables many potential environmental impacts to be avoided entirely. Where environmental impacts cannot be avoided by embedded mitigation, additional mitigation and monitoring measures have been recommended in the EIAR.

This chapter presents a summary of key mitigation measures to be implemented for the Proposed Development. A full list of all mitigation measures is presented in subsections 7 of all relevant chapters. Mitigation measures detailed in the relevant technical chapters are committed to here in this chapter under mitigation number "GM0" in Table 19.1, below.

The EIAR Project Team contributed to the compilation of this chapter.

19.2 Mitigation Measures Proposed

Mitigation and environmental commitments have been identified as general requirements which will help to avoid, reduce or offset potential impacts and are relevant to a number of the environmental aspects addressed in the EIAR.

General environmental mitigation measures specified within the EIAR are provided in Table 19.1; with key mitigation measures specific to EIAR technical assessments provided in Tables 19.2 to 19.14. Comprehensive mitigation measures, including imbedded mitigation measures are presented in each EIAR chapter, under the construction, operational and restoration phases for each element of the Proposed Development.

The timing of the implementation of the mitigation measures is indicated within the tables as:

Construction Phase[1]: This phase comprises the construction of screening berms, Cut-and-Cover Tunnel, Temporary Road Diversion (of the R179), and associated activities, as well as construction of sports pitches

[1] In terms of Knocknacran West, construction activities are similar in nature to operational activities as both involve earthworks. The specific construction phase for mine development is described under Mine Construction (Section 3.4, Chapter 3.0 of this EIAR), and includes construction of a Cut-and-Cover Tunnel under the R179, stripping of overburden and interburden material within the northern portion of the proposed open-cast, and the construction of an internal haul road and conveyor route from the mining area to the Cut-and-Cover Tunnel.

and ancillary building works and is expected to be of ca. 24 months duration overall (i.e., short-term) for the Community Sports Complex and ca. 12 months for the Mine Development (i.e., temporary – short-term);

Operational Phase: Proposed mining activities (ca. 30 - 35 year timeframe) will be of long-term duration (defined as lasting for fifteen to sixty years in accordance with the EPA's 2022 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports'), and will involve the extraction of gypsum from Knocknacran West and the restoration of Knocknacran to close to original ground levels.

The operational phase of the Community Sports Complex will be a permanent duration (i.e., lasting greater than sixty years). Therefore, the operational phase for the overall Proposed Development ranges between long-term and permanent. Clarity is provided within Tables 19.2 to 19.14 about the proposed duration of specific mitigation measures proposed; and

Restoration/Closure/Aftercare (Decommissioning) Phase: On cessation of mining activities, the proposed Closure, Restoration and Aftercare Management Plan (CRAMP) for Knocknacran West outlined in Appendix 3.3 will be developed to rehabilitate the mining sites and to enhance biodiversity opportunities there. The CRAMP will evolve throughout the life of the mine, taking community and statutory interests into account.

The aftercare phase will commence with an active closure phase (anticipated for 6 months), then a passive closure phase (anticipated for 12 months). This active and passive closure phase will, collectively, be of short-term duration (<2 years) and will comprise of physical closure works such as demolition (active closure) and environmental monitoring/ reporting (passive closure). The purpose of the latter is to demonstrate that the closure works have been successful, and that all environmental metrics for the Site are stable.

Once monitoring and measurement have demonstrated that the Site is in an environmentally stable state, the aftercare period will be fully established. The Site will remain in aftercare for a period to be agreed with the Regulatory Authorities, but it is currently anticipated to be 30 years.

A decommissioning phase for the Community Sports Complex has not been considered given its permanent nature.

Table 19.1: General Environmental Mitigation Requirements

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
GM0	**Activities on the Site will adhere to EU and National Guidelines and Legislation where applicable, and also follow Best Available Techniques (BAT) to prevent and minimise emissions and impacts on the environment. Mitigation and monitoring presented in the chapters of this EIAR will be implemented and adhered to.**	**All phases**
GM1	Two Construction Environmental Management Plans (CEMPs) will be prepared for the Site and take into account the requirements of ISO 14001. One CEMP will be for the Mine Development and one will be for the Community Sports Complex site. The appointed Main Contractor will review and amend the CEMPs, as required. The appointed Main Contractor will implement the CEMPs. The purpose of the CEMP(s) is to: • Minimise the environmental impact of the construction phase of the development through the incorporation of the planning consent's mitigating principles; • Ensure compliance with environmental legislation during this phase; • Identify relevant environmental risks and their management during construction; • Provide a system of continuous improvement in environmental performance for the construction activities; and • Identify the environmental management responsibility structure. The CEMP(s) is required to be approved by Monaghan County Council. The CEMP(s) will contain all the construction phase mitigation measures and plans identified in the EIAR. The appointed Main Contractor shall incorporate all the conditions set out in the planning approval into the CEMP and implement these on-site. The CEMP(s) will set out all the intended methods to manage potential environmental impacts from the construction of the Proposed Development. Other key elements will include:	Construction Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	• The appointment of an on-site Environmental Officer for the construction period of the Proposed Development; • Incorporation of all environmental commitments, including purpose and objective; • Incorporation of procedures to record any environmental incidents on site and procedures for implementing appropriate corrective and preventative measures; • Incorporation of procedures for staff environmental awareness; • Incorporation of environmental monitoring procedures; and • Incorporation of a system of audit and review. The CEMP(s) will be a live document and will be reviewed on a regular basis (i.e. as procedures are updated/revised) and updated accordingly by the appointed Main Contractor.	
GM2	The appointed Main Contractor shall ensure that the approved CEMP(s) is fully implemented during the construction phase, to prevent or reduce the impacts identified in the impact assessment. This includes maintaining and implementing all relevant management plans specified in the EIAR.	Construction Phase
GM3	SGMI will continue to implement its ISO14001 Environmental Management System (EMS) at their Site (i.e. the Mine Development). The purpose of the system is to: • Identify key environmental aspects and impacts; • Develop and implement controls to eliminate and minimise the environmental impact of the operation; • Ensure compliance with environmental legislation; • Carry out monitoring and checking to ensure control systems are working; and • Achieve continuous improvement by a process of review. The EMS identifies the operational mitigation measures and plans identified in the EIAR, and the following Sections.	Operational and Restoration/Closure Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	The EMS shall govern all the intended methods to manage potential environmental impacts from the operation of the Proposed Development.	
GM4	The key elements of the EMS that will be updated accordingly throughout the duration of the Mine Development include: • Appointment of and maintenance of an Environmental Officer by SGMI for the duration of the activities; • The documentation and record of any environmental incidents on Site, and the actions taken for implementing appropriate corrective and preventative measures; • The review and application of relevant guidance informing the environmental performance of the Proposed Development; • Ongoing training of environmental awareness for all staff; • The documentation, compilation and review of environmental monitoring results; and • Periodic review of the EMS.	Operational and Restoration/Closure Phase
GM5	The Mine Manager, with the support of the appointed Environmental Officer shall ensure that the EMS is fully implemented during the operation phase in agreement with the EPA, Monaghan County Council, and the Department of the Environment, Climate and Communications (DECC) to prevent or reduce the impacts identified in the impact assessment. SGMI will be responsible for ensuring that all embedded mitigation and relevant operational management plans required by the EIAR are appropriately maintained.	Operational and Restoration/Closure Phase
GM6	SGMI will implement the Closure, Restoration and Aftercare Management Plan (CRAMP) at their Site (i.e. the Mine Development). This plan will identify the methods by which works will be managed to meet these commitments and requirements. The CRAMP will be carried out in accordance with the provisions of the EMS procedures and requirements of the Site's IE Licence.	Restoration/Closure Phase
GM7	The appointed Environmental Officer shall ensure that the CRAMP is fully implemented in agreement with the EPA, Monaghan	Aftercare Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	County Council, and the DECC to ensure that the Site is restored in the interest of environmental sustainability, visual amenity, traffic safety, adjoining residential amenity, and proper planning and sustainable development of the area.	
	NOTE: Any further general environmental mitigation measures within authorisation or consents to be included in this section and adhered to.	Construction, Operational and Restoration/Closure Phase

Table 19.2: Specific Environmental Mitigation Requirements - Population, Human Health and Community

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
PHHC1	**Population** Nuisance to the local population from noise, vibration, dusts, landscape and visuals impacts, and impacts to groundwater and surface waters will be mitigated during the construction phases for the Community Sports Complex and the construction, operation and aftercare phases of the Mine Development. Specific mitigation and best practices have been discussed in the respective chapters of this EIAR: Land, Soils and Geology (Chapter 7.0), Water (Chapter 8.0), Climate (Chapter 9.0), Air Quality (Chapter 10.0), Noise (Chapter 11.0), Vibration (Chapter 12.0), Landscape and Visual (Chapter 13.0), and Traffic and Transport (Chapter 14.0). To mitigate potential nuisance during construction, a CEMP(s) will be implemented in full. To mitigate potential nuisance during operation, SGMI will be required to demonstrate compliance with environmental limits as set out within IE Licence P0519-04 (and any subsequent revision) for the Mine Development.	Construction, Operational and Aftercare Phase
PHHC2	**Amenity** Mitigation measures related to the management of nuisance dusts and noise have been discussed in Climate (Chapter 9.0), Air Quality (Chapter 10.0), Noise (Chapter 11.0) and Vibration (Chapter 12.0).	Construction, Operational and Restoration/Closure

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	A CEMP(s) will be developed for the construction phase of the Knocknacran West Mine and Community Sports Complex. This will provide provisions for the mitigation of nuisance and the management of the site.	Phase
PHHC3	**Amenity** The Applicant will continue to undertake community consultation through its Community Liaison Officer, updates on the company's website and community events as required for the Mine Development. The Applicant will have continued dialogue with the local community on the progress of the development and land rehabilitation plans. The Applicant will continue to recognise that a change to the sense of place is arising from the Mine Development. In the event of a grant of permission and subsequent development, SGMI will undertake to develop a records pack that will create a permanent record of the area to be developed.	Construction, Operational and Aftercare Phase
PHHC4	**Amenity** The design of the Mine Development to link the northern and southern areas of the site include a tunnel under the R179. Therefore, traffic impacts associated with movements between mining areas and the processing plant will be minimised.	Construction and Operational Phase
PHHC5	**Human Health, and Health and Safety** Specific mitigation measures and best practices have been discussed in the respective chapters of this EIAR: Air Quality (Chapter 10.0), Noise (Chapter 11.0) and Vibration (Chapter 12.0). Site operations are managed in accordance with relevant Health and Safety legislation (Safety, Health & Welfare at Work Act (2005, as amended)); and the Mines and Quarries Act (1965, as amended)) and subsequent Regulations relating to health and safety, training, and appropriate site management. The development of a CEMP for Knocknacran West Mine and associated site Health and Safety Management Plan will ensure that hazards which may affect any relevant parties during the construction, operation and aftercare phases are appropriately mitigated.	Construction, Operational and Restoration/Closure Phase
PHHC6	**Health and Safety** - A Construction Traffic Management Plan(s) for the Proposed Development will be developed in order to manage instances where construction traffic may affect local road users. Methods and approaches in this plan will be agreed with Monaghan County Council as appropriate.	Construction Phase
PHHC7	**Health and Safety** - The main contractor's CEMPs will contain provisions for site security for the Proposed Development. These provisions will detail appropriate measures to ensure access is restricted to authorised personnel only. Fencing and	Construction Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	berms will be erected along boundaries as appropriate.	
	NOTE: Any further mitigation measures related to Population and Human Health detailed within authorisation or consents to be included in this section and adhered to.	

Table 19.3: Specific Environmental Mitigation Requirements - Biodiversity

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
B1	All Site construction will be undertaken in accordance with the CIRIA (2016) Environmental Good Practice on Site Guide (fourth edition) or any subsequent relevant revisions.	Construction Phase
B2	**Environmental Management Plan** The Environmental Management Plan (EMP), detailing all environmental mitigation measures will be updated and adhered to during the operational life of the Mine Development. The Habitat Management Plan (HMP) which accompanies the EMP and details relevant and necessary prescriptions for management of features, will be updated and implemented during all phases of the Mine Development. Both the EMP and HMP are live documents.	Construction, Operational and Restoration/Closure Phase
B3	**Lighting** Lighting will be minimised during hours of darkness and will not illuminate peripheral mature trees and vegetation to ensure no adverse effects on bats and other nocturnal species. The lighting strategy will maintain any opportunities within the Site for nocturnal and crepuscular species by using timers, cowls and hoods to maintain dark skies and avoid illuminating features such as woodland and hedgerow habitat.	Construction, Operational and Restoration/Closure Phase
B4	**Water Management System** Any discharge water will be strictly monitored and only discharged once in compliance with IE Licence P0519-04 (or any subsequent revision).	Construction, Operational and Restoration/Closure Phase
B5	**Hydrocarbons/Chemical Safeguards & Protection of Site Water** The following measures will be implemented to prevent the release of hydrocarbons or other chemicals harmful to biodiversity into the environment: • All soil / overburden stockpiles shall be covered (i.e. vegetated) to minimise the risk of rain / wind erosion; • Restoration of topsoil and overburden will be carried out on a phased basis to reduce the vulnerability of the underlying aquifer to possible contamination; • Continued operation and maintenance of the existing bunds and hydrocarbon interceptor will occur;	Construction, Operational and Restoration/Closure Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	• Regular maintenance and emptying of the hydrocarbon interceptor as per manufacturer's recommendations will be implemented; • All plant and machinery will continue to be regularly serviced before being used on site; • Mobile plant will be refuelled on an existing dedicated concrete hardstanding apron (with associated interceptor) on the permitted adjacent mine site. Static plant or tracked excavators will refuel over a drip tray with an absorbent mat. In addition, spill kits will be maintained on site to deal with all spills and leaks, and spill training will be provided to relevant staff members; • Mobile bowsers, tanks and drums will be stored in secure, impermeable storage areas away from open water; • Dust suppression will be achieved by bowsers operating on haul roads or by providing hardstanding surfaces on permanently trafficked areas; • Fuel and oil containers will be stored within a secondary containment system, e.g. bunds for static tanks or a drip tray for mobile stores; • Containers and bunding for storage of hydrocarbons and chemicals will have a holding capacity of 110% of the volume to be stored; • Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage; • Drip-trays will be used for fixed or mobile plant such as pumps and generators in order to retain oil leaks and spills; • Only designated trained operators will be authorised to refuel mobile plant on site; • Procedures and contingency plans will be set up to deal with emergency accidents or spills; and • Emergency spill kits (including absorbers) will be available for use in the event of an accidental spill on the mine floor and key personnel trained in their use.	
B6	**General Faunal Safeguards** The following safeguarding measures will be implemented to mitigate risk to fauna (such as badgers and small	Construction and Operational Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	mammals) which enter the site during works: • Any excavations that will remain overnight will include measures to ensure any mammals that may enter the excavation have a way to get out, such as graded banks, or a rough plank of wood to act as a 'crawl board'; • Should the works expose any pipework, for any larger pipes (supporting a diameter of approximately 15 cm or larger), any exposed ends of piping will be covered, to prevent any mammals (such as badger) making opportunistic use of the piping; • Any fuel or chemical storage within the site will take into consideration the risk of access and / or damage by mammals (such as foxes or badgers); and • Good working practices will be observed across the site, such as avoiding littering and maintaining a tidy construction area with materials stored on pallets.	
B7	**Derogation Licences for Bats** Ongoing dialogue will be maintained with the NPWS regarding the derogation licence for bats and a derogation licence will be reapplied for, as needed for the Mine Development. Mitigation works committed as part of this licence will be delivered as described within this licence or future licences.	Construction Phase
B8	**Bat Roosts** **Trees** - In order to protect retained hedgerows and trees (including woodland habitat), such vegetation will be protected with secure fencing prior to the commencement of construction works on Site (in line Monaghan County Council's County Development Plan). This protection will be designed following NRA guidance (NRA, 2005), in particular with regard to root protection areas and fencing specifications (unless otherwise advised by a suitably qualified arboriculturist). Where any trees with moderate or high bat roosting potential have been identified and will require felling, further survey work will likely be required in order to establish the presence or absence of roosting bats (i.e. aerial inspection or dusk/dawn survey work). Should a bat roost be identified within any trees subject to survey, a derogation licence will need to be sought in order to facilitate the felling of such trees.	Construction Phase Operational Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	Any trees recorded to have low bat roosting potential will be felled in a manner that reduces the risks of harming fauna in the process (soft felling). Soft-felling involves the whole of the tree and any large branches being cut down in sections, with each section being carefully lowered to the ground. Once felled, timber will be left in situ on the ground for a minimum of 24 hours before being chipped or removed in order for any resident fauna to disperse without harm.	
B9	**Buildings** - Ongoing dialogue will be maintained with the NPWS regarding the derogation licence for bats and a derogation licence will be reapplied for, as needed for the Mine Development. Mitigation works committed as part of this licence will be delivered as described within this licence or future licences. The proposed mitigation strategy will provide replacement bat roosting opportunities to fully off-set the loss of the bat roosts proposed. Specifically, the following will be provided: • Building enhancement at retained structures (e.g. Shirley House); • Provision of a bespoke roost; and • Provision of Bat boxes. A minimum of 15 bat boxes will be installed at appropriate locations. The boxes will be installed on trees which are in good health. The selection of bat box locations will be decided in consultation with an Ecologist and with cognisance of the following: • Bat boxes should be installed at a minimum height of 4 m above ground level, and in locations which are inaccessible to unaided climbing (to minimise risk of vandalism). • Two bat boxes should be installed on each of the three of the most suitable trees. • Locations should be chosen which are not vulnerable to artificial light pollution. Boxes will be installed so that they have southern or westerly aspects and preferably in locations where they will receive some direct sunlight.	Construction Phase
B10	**Foraging/Commuting** - Suitable screening and planting will take place in proximity to the proposed roosts and connectively between the roosts and surrounding landscape will be maintained. Planting along the L4900 would provide a corridor to connect 'Building 4' (Shirley House) to the woodland area to the north that will be largely retained (south of Drumgoosat Village).	All phases

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	To compensate for the loss of hedgerows and trees (utilised by foraging/commuting bats), replacement habitats will be provided under the restoration plan for the mine, including provision of hedgerows, wildflower grassland, scrub, and a central lake. This planting will have regard to restoring connectivity across the Site and with the wider landscape. In the short-term, the restoration of the current mine (to the south of the R179) will include the provision of habitats similar to those which will be lost in the north of the Site, increasing the habitat available for foraging/commuting bats in the wider area.	
B11	**Badgers** Alternative habitat surrounds the extraction area, and these lands are in the ownership of the Applicant. Engagement is ongoing with the NPWS about the relocation of the onsite badger setts, and will continue for the timely and safe relocation of the animals to take place. Other badger mitigation measures which will be put in place at the site during construction works are as follows: • Pre-construction badger surveys will be undertaken prior to site clearance works, in order to identify the extent of use by badgers, or absence of use of the setts; • Where excavation works are required onsite, mitigation measures will be put in place to prevent mammal ingress; • Fencing will be put in place along the perimeter of the work areas; and • If setts are found within the works area, the Ecological Clerk of Works (ECoW) will be contacted for advice and the ECoW will liaise with the NPWS and regulatory authority, where necessary.	Construction Phase
	The proposed development area includes the entirety of the Site area. Within the overall Site blasting will only take place in the Knocknacran West open-cast mine during the extraction of gypsum. • In terms of the impacts of blasting on badgers (blasting associated with the Knocknacran West site lies further within the site interior than the redline development boundary), a 150 m stand-off/offset from the edge of the active gypsum faces (i.e., the blast line) for the protection of badgers is proposed. • Badger mitigation measures which will be put in place at the site during operational works are as follows:	Operational Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	• Fencing will be put in place along the perimeter of the works areas to prevent badger access to open-cast work areas; • Badger surveys will be undertaken prior to ground clearance works (stripping campaigns which would require overburden removal); and • If setts are found within the works area or in advance of stripping campaigns in new work areas, the Ecological Clerk of Works (ECoW) will be contacted for advice.	
B12	**Birds** Any demolition of buildings with potential to support nesting birds will be undertaken outside of the bird nesting season (March to August inclusive). Consultation will occur with the Regulatory Authority regarding the provision of a barn owl derogation licence (if required based on pre-construction surveys) and a mitigation strategy will be delivered for this species and documented within the EMP. This will include the provision of alternative nesting habitat as appropriate. If there is a necessity for vegetation clearance within the nesting season, a suitably qualified ecologist will carry out a series of nesting bird checks in advance of any works to ascertain breeding activity in affected areas. Habitat compensation measures (as set out above) will serve to ensure the maintenance of foraging, shelter, and nesting opportunities within the site in the long-term. In the short-term, nest boxes will be provided on suitable retained trees at the periphery of the site, in order to ensure replacement nesting opportunities are immediately available.	Construction and Operational Phase
B13	**Invasive Species** Measures will be implemented throughout site works to safeguard against the spread of any invasive non-native species (such as cotoneaster, Japanese knotweed or rhododendron). Indeed, where possible such plants will be removed from the Site (and disposed of appropriately, following an appropriate method statement). Japanese knotweed is conformed on Site and will continue to be dealt with by an appropriately qualified contractor.	Construction, Operational and Restoration/Closure Phase
B14	**Protection of Retained habitat** Retained vegetation (hedgerows and trees, including woodland habitat), will be protected with secure fencing prior to the commencement of construction works on site (in line with Chapter 17 of the Monaghan Local Plan and NRA	Construction Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	guidance).	
B15	**Habitat Compensation** Removal of boundary hedgerows and trees outside the development footprint will be avoided where possible. Planting will be required to mitigate for tree removal and future restoration plans will be required to replace any trees and shrub species removed on a "like for like" basis (as a minimum). Consideration will be given towards hawthorn, blackthorn mix with individual alder and birch (to form native tree hedges) and deciduous trees (native tree species include oak, alder and birch).	Construction and Restoration/Closure Phase
B16	**Habitat Provision** In the short-term, hedgerows will be planted as part of buffer zones to maintain ecological connectivity.	Construction and Operational Phase
B17	**Restoration** The restoration plan for the Mine Development will be updated annually as part of the Applicant's commitments under the Site's IE Licence (P0519-04, and any subsequent revisions) and the provisions of the Closure, Restoration and Aftercare Management Plan (CRAMP) outlined in Appendix 3.3. The HMP includes for the provision of aquatic habitat, woodland and hedgerow planting, plus grassland creation. The Mine Development also allows for the retention of woodland within the Application Site boundary to the north.	Restoration/Closure Phase
B18	**Enhancement** A phased restoration plan will replace lost key habitats which will have been of importance to birds, bats and small mammals within the Mine Development. Final profiling of the open-cast slopes will be completed to ensure that any in-situ gypsum is covered, and benches are made safe. This will allow the planting of native grasses, wildflowers, scrub and trees to be undertaken and biodiverse habitats to be developed. Features will include a lake and areas of natural grassland/wildflowers and woodland. The area where the haul ramp enters the water will be graded and planted with plants suitable to that environment, adding additional biodiversity to the Site as a whole.	Operational and Restoration/Closure Phase
B19	**Enhancement** **Habitat** - Where possible, the restoration plan for the Mine Development will include habitats of elevated value, such as species-rich hedgerows and wildflower grassland. Planting will comprise native species of local provenance. Where this	Restoration/Closure Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	is not possible, plants will be selected for their fruit, berry, or nectar bearing qualities. All landscape planting within the site will be managed for the benefit of wildlife.	
B20	**Enhancement** **Fauna** - Several bat and bird boxes will be incorporated in the restoration of the site, placed on trees of a suitable size. In addition, to increase opportunities for invertebrates within the site, invertebrate boxes and habitat piles will be provided under the restoration plan; these will be in sheltered areas of new and retained vegetation, such as in association with hedgerows.	Restoration/Closure Phase
	NOTE: Any further mitigation measures related to Biodiversity detailed within authorisation or consents to be included in this section and adhered to.	

Table 19.4: Specific Environmental Mitigation Requirements - Land, Soils and Geology

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
LSG1	Site operations will be managed in accordance with relevant health and Safety legislation (Safety, Health & Welfare at Work Act (2005, as amended)); and the Mines and Quarries Act (1965, as amended)).	Construction, Operational and Restoration/Closure Phase
LSG2	Fencing will be maintained at the Site to ensure that the risk of injury to the public and livestock is minimised. All entrance gates will be locked and controlled by the Site's management.	Construction, Operational and Restoration/Closure Phase
LSG3	The extraction of gypsum will take place using the mining industry standard method of cyclical drilling, blasting, loading, hauling and ground support.	Construction and Operational Phase
LSG4	The removal of soils will be conducted on a phased basis to reduce the overall potential impact on the land use and	Construction and Operational Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	underlying groundwater.	
LSG5	Re-handling of the topsoil will be kept to a minimum to preserve the integrity of the material.	Construction, Operational and Restoration/Closure Phase
LSG6	All plant on the Site be regularly maintained, and where plant is damaged or leaking, it will be fixed or replaced immediately, as part of ongoing operational management of the site.	Construction and Operational Phase
LSG7	Refuelling and the addition of hydraulic oils or lubricants to vehicles or generators will take place on-site only in designated areas. Mobile plant will use the existing refuelling facilities at the Plant Site garage for refuelling. Static plant and tracked excavators will refuel over a drip tray with an absorbent mat.	Construction and Operational Phase
LSG8	Existing groundwater wells will be continuously monitored on site during mining operations and for a period following cessation of mining (to be agreed with the relevant authorities).	Construction, Operational and Restoration/Closure Phase
LSG9	Blasting will take place at the Site using licenced and experienced operators. Site management will give advance notification of blasting events to nearby residents in line with current standard procedures in operation at the existing mine.	Construction and Operational Phase
LSG10	Geotechnical assessments will be conducted on a regular basis by an experienced and suitably qualified geotechnical engineer. The current slope angles are designed to ensure that the risk of slope failure is effectively eliminated by using a suitable safety factor.	Construction, Operational and Restoration/Closure Phase
LSG11	The mine manager will ensure compliance with relevant safety and statutory legislation and best practices recommended by national legislation (and guidelines).	Restoration/Closure Phase
LSG12	Stockpiles will be evaluated and monitored and kept stable for safety and to minimise erosion.	Construction and Operational Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
LSG13	During mining of Knocknacran West, where underground workings are exposed (which would remain in situ) the opportunity and practicalities of accessing the workings to carryout support work to ensure continued ground stability under the roadways where the mine workings occur will be assessed.	Construction and Operational Phase
LSG14	On-going Geotechnical monitoring by means of extensometers will continue throughout the life of the mine along the R179 and L4900 and after cessation of mining.	Construction, Operational and Restoration/Closure Phase
LSG15	The provision of adequate drainage along the upper benches of the proposed Knocknacran West Mine in the overburden will be employed as is the current arrangement in the existing Knocknacran Mine.	Construction and Operational Phase
	NOTE: Any further mitigation measures related to Land, Soils and Geology detailed within authorisation or consents to be included in this section and adhered to.	

Table 19.5: Specific Environmental Mitigation Requirements - Water

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
W1	**Open Cast Mining Areas** The current mine water management system will be maintained throughout the entire period of mining and until such time as full restoration of the entire site has been completed: • The water balance model confirms that existing infrastructure will be sufficient for the purposes of managing all water from the proposed future extraction and restoration phases of the mine; • All future gypsum mining will be from an area that has previously been mined by underground means; and • The ability to temporarily store water in the base of existing Knocknacran Mine and subsequently in the Knocknacran West	Construction, Operational and Restoraion/Closure Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	Mine will be retained, until the flows and assimilative capacity in the receiving River Bursk are sufficient to allow discharge. This mitigates against the impact of releasing high sulphate water into the River Bursk, thereby preventing degradation of the river environment.	
W2	Backfill material (stripped mudstone) will be placed against the pit slopes of the Knocknacran West Open-Cast Mine to provide hydraulic isolation of the gypsum strata that remain below the R179 and L4900 roads. The north and west slopes of the existing Knocknacran Mine have already been backfilled in this manner to minimize circulation of groundwater beneath the R179.	Construction, Operational and Restoration/Closure Phase
W3	Areas identified with current or potential future surface settlement above the historic Drumgoosat workings will be stripped and incorporated into the Knocknacran West Open-Cast Mine.	Construction and Operational Phase
W4	All topsoil, overburden and interburden (mudstone and dolerite) from within the proposed Knocknacran West Mine not used in ongoing restoration will be stored in temporary stockpiles and vegetated to minimise the risk of rain/wind erosion. All temporarily stockpiled material will be subsequently used in the final restoration of the Knocknacran West Mine.	Construction and Operational Phase
W5	Restoration of any remaining gypsum that may be exposed in the sides of the Open-Cast Mine will be covered with low permeability material (i.e. previously stripped mudstone) to help optimize pumped water quality from the mine during operations and final water quality post-restoration of the site.	Operational and Restoration/Closure Phase
W6	Control of suspended solids will be carried out using settlement on the pit floor and in a sump(s).	Construction and Operational Phase
W7	Whenever possible, water from the pit sump(s) will be preferentially used for dust suppression.	Construction and Operational Phase
W8	The pit sump(s) will be regularly cleaned to remove fine grained material, with the material being used in rehabilitation and restoration work.	Construction and Operational Phase
W9	An on-going programme of regular cleaning and maintenance will be carried out for the sump(s), attenuation ponds and other on-site water management infrastructure.	Construction and Operational Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
W10	Mobile plant will use the existing refuelling facilities at the Plant Site garage for refuelling. Static plant and tracked excavators will refuel over a drip tray with an absorbent mat.	Construction and Operational Phase
W11	All mobile plant shall be regularly maintained, and where plant is damaged or leaking it will be fixed or replaced immediately, as part of the ongoing operational management of the mine to reduce the risk of leaks.	Construction and Operational Phase
W12	No storage of hydrocarbons will take place in the Open-Cast area.	Construction and Operational Phase
W13	Emergency spill kits (including absorbers) will be available for use in the event of an accidental spill in the Open-Cast area.	Construction and Operational Phase
W14	Regular monitoring of groundwater (levels and quality) will continue to take place using existing monitoring boreholes in compliance with IE Licence P0519-04.	Construction, Operational and Restoration/Closure Phase
W15	Ongoing (real-time) monitoring of surface (mine) water discharge to the River Bursk will continue to take place in compliance with IE Licence P0519-04.	Construction, Operational and Restoration/Closure Phase
W16	If any potential for accumulating water is identified during development, additional field drains will be installed to minimise the potential for accumulating water.	Construction, Operational and Restoration/Closure Phase
W17	**Plant Site Area** In the Plant Site area, local surface water runoff is prevented from discharging to surface water by a series of gullies and drains prior to passing through a hydrocarbon interceptor. In addition: • Maintenance of vehicles will be confined to the workshop area where practical; • Hydraulic oils and engine oils will be adequately bunded;	Construction and Operational Phase

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
	• Fuel tanks will be bunded or have double skins; • Waste oils will be collected and stored prior to collection by a hazardous waste contractor; and • The continuation of good housekeeping during operations, by adhering to best practices, will continue to mitigate against potential impacts on the surrounding water environment.	
W18	**Community Sports Complex** Good site management and efficient working practices (not leaving exposed trenches) will be implemented to mitigate any impact of earthworks on water courses. Surface run-off will be managed by attenuation measures and wastewater will be managed by a fully designed and engineered wastewater management system.	Construction and Operational Phase
	NOTE: Any further mitigation measures related to Water detailed within authorisation or consents to be included in this section and adhered to.	

Table 19.6: Specific Environmental Mitigation Requirements - Climate

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
C1	Saint-Gobain is committed to reducing its CO_2 emissions by 20% by 2025. The end-use product, which is produced from the gypsum at the Mine Development, is used in technology which has been designed to be innovative and increase the energy efficiency of new builds, and also increase the thermal renovation of the current building stock.	Construction and Operational Phase

C2	**Direct Emissions** The following mitigation measures will be put in place to limit vehicle and plant emissions from mining activities: • No vehicles or plant will be left idling unnecessarily; • Vehicles and plant will be well maintained. Should any emissions of dark smoke occur (except during start up) then the relevant machinery will be stopped immediately, and any problem rectified before being used; • Engines and exhaust systems will be regularly serviced according to the manufacturer's recommendations and maintained to meet statutory limits/opacity tests; • Full loads will be used in road haulage in order to minimise the carbon footprint per load of exported materials; and • Minimising the double handling of materials.	Construction and Operational Phase
C3	Overburden will be stockpiled on the mine site within the screening berms, which will be planted. Coupled with the ecological screening areas set aside, the perimeter berms will seek to minimise carbon loss through soil stripping. Soils stripping during wetter periods will also ensure that carbon losses are reduced compared with warmer drier periods.	Construction and Operational Phase
C4	The Knocknacran Mine will be actively restored, and it is considered that the screening areas and final site restoration of both mines will positively contribute to the carbon sequestration of the sites.	Operational and Restoration Phase
C5	**Indirect Emissions** Energy efficiencies and incentives will be inbuilt into the Site's electrical infrastructure and management practices. Energy consumption and greenhouse gas emissions will be reduced by buying 100% green energy. This energy reduction and efficient use will be promoted in areas of the Site including efficient site lighting using LED lighting, particularly in relation to the lighting of the sports pitches.	Construction, Operational and Restoration/Closure Phase
C6	**Indirect Emissions Not Under Control of the Project** SGMI have developed an onsite recycling process for off-cut plasterboard produced on construction sites. These off-cuts are collected and brought back to the plasterboard manufacturing facility for recycling and reuse, where traceability certificates outlining the lifecycle of the construction material cut-offs are issued. SGMI will also ensure that they are able to influence their supply chains towards more environmentally sustainable practices.	Construction and Operational Phase

	NOTE: Any further mitigation measures related to Climate detailed within authorisation or consents to be included in this section and adhered to.	

Table 19.7: Specific Environmental Mitigation Requirements - Air Quality

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
AQ1	Dust monitoring will continue to be carried out monthly at the designated monitoring locations on the Mine Development. The additional monitoring locations on the Knocknacran West Mine site will be incorporated into the EPA IE licence in consultation with the EPA (and relevant stakeholders) during the IE licence revision process. An ambient monitoring station (i.e. PM10 and PM25 will be established on the Knocknacran West Mine site for the operational life of the mine, this will be agreed in consultation with the EPA during a licence revision of the existing IE licence).	Construction and Operational Phase
AQ2	The timing of operations will be optimised in relation to meteorological conditions – taking into account periods of prolonged rainfall, high winds and snow/ice.	Construction and Operational Phase
AQ3	Overburden will be stripped in stages according to the mining schedule, reducing the risk of mass dust emissions on the Mine Development.	Construction and Operational Phase
AQ4	Material in outdoor stockpiling will be located within the mining void to take advantage of shelter from wind for the Mine Development.	Construction and Operational Phase
AQ5	Overburden mounds will be grass-seeded and planted to eliminate wind-blown dust.	Construction and Operational Phase
AQ6	Existing hedgerows will be used as a means of screening, with a security fence and a vegetated berm for dust, noise and visual screening. Berms will be 2 m high and 2 m wide and planted, with a section of 4 m by 4 m berm along the western and southern boundaries of the proposed Knocknacran West Mine.	Construction and Operational Phase
AQ7	The existing woodland area to the north of the proposed boundary of the open-cast mine will be kept (and enhanced with additional planting of native species), to act as a natural buffer.	Construction and Operational Phase

AQ8	Plant will be regularly maintained. Internal haul roads will be compacted and maintained (a water-bowser will be available at all times should haul roads need dampening to minimise dust blow during working hours).	Construction and Operational Phase
AQ9	Equipment will be enclosed, such as the semi-mobile crusher and covered conveyor.	Construction and Operational Phase
AQ10	On site speed restrictions (<20 kph) will be maintained in order to limit the generation of fugitive dust emissions for the Mine Development.	Construction and Operational Phase
AQ11	The proposed Knocknacran West Site will operate as a closed site, with access to the site via a proposed Cut-and-Cover Tunnel under the R179 road.	Construction and Operational Phase
AQ12	Mitigation Measures that will be employed during construction activities include: • At the Site Entrance, provide the name and contact details of person(s) responsible for the overall and environmental management of the Site; • Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken; • Record any exceptional incidents that cause dust and/or air emissions, either on-or off-site, and the action taken to resolve the situation in a log book; • Carry out regular site inspections; • Plan site layout so that machinery and dust causing activities including stockpiling are located away from receptors, as far as is possible; • Erect solid screens or barriers around dusty activities and/or at the site boundary; • Avoid site runoff of water or mud; • Ensure all vehicles switch off engines when stationary – no idling vehicles; • Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable; • Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression systems, such as water sprays;	Construction and Operational Phase

	• Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate; • Use enclosed chutes and conveyors and covered transfer points; • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; • Avoid bonfires and burning of waste materials; • Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site; • Avoid dry sweeping of large areas; • Ensure vehicles entering and leaving Site are covered to prevent escape of materials during transport; and • Record all inspections of haul routes and any subsequent action in a site log book.	
AQS13	The following mitigation measures will be put in place to limit vehicle and plant emissions: • No vehicles or plant will be left idling unnecessarily; • Vehicles and plant will be well maintained. Should any emissions of dark smoke occur (except during start up) then the relevant machinery will be stopped immediately, and any problem rectified before being used; • Engines and exhaust systems will be regularly serviced according to the manufacturer's recommendations and maintained to meet statutory limits/opacity tests; and • All vehicles will hold a current Department of Environment certificate where required.	Construction and Operational Phase
AQS14	All vehicles entering and leaving the mine plant site will use the existing vehicle wash facilities.	Construction and Operational Phase
	NOTE: Any further mitigation measures related to Air Quality detailed within authorisation or consents to be included in this section and adhered to.	

Table 19.8: Specific Environmental Mitigation Requirements - Noise

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
N1	**Mine Development** A noise monitoring programme will be maintained at the existing mine monitoring locations and additional monitoring locations around the Knocknacran West Mine site will be incorporated into the IE Licence in consultation with the EPA (and relevant stakeholders) as part of the licence revision.	Construction and Operational Phase
N2	When the Knocknacran West Mine is at its full pit boundary extent (given favourable market conditions), the work practices and site activities will be coordinated and timed in such a manner to ensure concurrent rock-breaking and crushing operations in the pit floor do not exceed noise levels and cause nuisance to the local environment.	Construction and Operational Phase
N3	Perimeter screening berms will be constructed along the site boundary and screening berms will be planted with native tree and shrub species.	Construction Phase
N4	All haul roads will be kept clean and maintained in a good state of repair.	Construction and Operational Phase
N5	Heavy goods vehicles entering and leaving the Site will have tailgates securely fastened; all mobile plant used will have noise emission levels that comply with relevant guidance.	Construction and Operational Phase
N6	Plant will be operated in a proper manner with respect to minimising noise emissions, e.g. minimisation of drop heights, no unnecessary revving of engines, plant used intermittently not left idling.	Construction and Operational Phase
N7	Plant will be subject to regular maintenance, i.e. all moving parts kept well lubricated, the integrity of silencers and acoustic hoods maintained.	Operational Phase
N8	Plant will be fitted with effective exhaust silencers and maintained in good working order to meet manufacturers' noise rating levels. Defective silencers will be replaced.	Operational Phase
N9	**Community Sports Complex** Perimeter screening berms and/or bolstering of hedges will be take place along the site boundary.	Construction Phase
N10	Screening berms/bolstering of hedges will be planted with native tree and shrub species.	Construction Phase

N11	Scheduling of certain works to more acceptable times of day.	Construction Phase
N12	Use of the most environmentally acceptable plant and equipment which is properly maintained and silenced.	Construction Phase
N13	Proper instruction and supervision of staff including Tool Box talks.	Construction Phase
N14	There will be rest periods during which all operations are temporarily ceased and the plant will be shut down when not required.	Construction Phase
N15	Limiting dump height of materials into transport vehicles.	Construction Phase
N16	Locating material storage compounds and access roads away from sensitive areas.	Construction Phase
N17	Heavy goods vehicles entering and leaving the Site will have tailgates securely fastened; all mobile plant used will have noise emission levels that comply with relevant guidance.	Construction Phase
N18	Plant will be operated in a proper manner with respect to minimising noise emissions, e.g. minimisation of drop heights, no unnecessary revving of engines, plant used intermittently not left idling.	Construction Phase
N19	Plant will be subject to regular maintenance, i.e. all moving parts kept well lubricated, the integrity of silencers and acoustic hoods maintained	Construction Phase
	NOTE: Any further mitigation measures related to Noise detailed within authorisation or consents to be included in this section and adhered to.	

Table 19.9: Specific Environmental Mitigation Requirements - Vibration

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
V1	The proposed screening berms to be located around the perimeter of the Application Site will be left intact for the life of the mine (and in perpetuity to continue to provide biodiversity to the Site and the local environment). They will also serve to mitigate against noise, as well as offer reduced visibility of the Site from the public road network and surrounding lands.	Construction and Operational Phase

V2	All blasts will be initiated by electronic detonation system.	Construction and Operational Phase
V3	Ensure that the optimum blast ratio is maintained, and that the maximum instantaneous charge is optimised so that the ground vibration levels are kept below those specified.	Construction and Operational Phase
V4	Explosive charges are properly and adequately confined by using a sufficient quantity of stemming.	Construction and Operational Phase
V5	Adequate confinement of all charges by means of accurate face survey and the subsequent judicious placement of explosives.	Construction and Operational Phase
V6	No blasting carried out at weekends or public holidays.	Construction and Operational Phase
V7	No exposed detonating fuse used in blasting.	Construction and Operational Phase
V8	The proposed mine design has incorporated the proximal receptors into the early design process and boundaries have been offset so that the cut of the excavation will be 100 m from the nearest receptor, at a minimum.	Construction and Operational Phase
V9	An area which is densely populated by woodland separates Drumgoosat village from the proposed Knocknacran West Mine. As part of the mine design process, this woodland area will be retained to buffer potential impacts from the proposed extraction activities.	Construction and Operational Phase
V10	Notice of blasting times will continue to be given as currently practiced.	Construction and Operational Phase
V11	Blasting to be carried out by professionally trained blast engineers.	Construction and Operational Phase
V12	Blasts will be measured (ground vibration & air overpressure) at monitoring locations to ensure compliance with the limits. Information collected to be used in any necessary modification of future blast designs.	Construction and Operational Phase
V13	All monitoring equipment calibrated regularly to ensure that peak particle velocity and air overpressure generated from each blast is accurately measured.	Construction and Operational Phase

	NOTE: Any further mitigation measures related to Vibration detailed within authorisation or consents to be included in this section and adhered to.	

Table 19.10: Specific Environmental Mitigation Requirements - Landscape and Visual

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
LV1	Prior to excavation, a perimeter screening berm will be constructed on all sides of the Knocknacran West Mine site. This will assist in screening works in the proposed Knocknacran West Open-Cast Mine from sensitive views to the south (i.e. along the busy R1797 road), and, less so, to the eastern and north-western boundaries of the Site, which are aligned by local/third class roads. In addition, the proposed berms will be planted in a native woodland mix to provide a 'green' screen surrounding the Knocknacran West boundary within a decade.	Construction and Operational Phase
LV2	All existing roadside trees and vegetation will be retained along adjacent roads to the Knocknacran West Mine site, to further assist in screening the Proposed Development.	Construction and Operational Phase
LV3	An area of existing wooded, higher to the north of the proposed extraction area will be left in place and will screen any potential views of the proposed excavation at Knocknacran West from the village of Drumgoosat.	Construction and Operational Phase
LV4	The material (overburden and interburden) will be transferred from the proposed Knocknacran West Mine via haul truck, through a cut-and- cover tunnel beneath the R179, to be used in the phased restoration of Knocknacran Mine site.	Restoration/Closure Phase
LV5	The restoration of the Knocknacran West site will be achieved through re-profiling and re-grading of benches with the use of previously stripped material. Slope stabilisation will be achieved through grass seeding which will minimise any long-term visible presence of the excavation on the landscape and will help facilitate the re-establishment of grassland and hedgerows, and their accompanying ecological habitats. In addition, post-excavation, the site of the Knocknacran West Mine will be partially restored, with a lake at the centre of the site.	Restoration/Closure Phase
LV6	The existing Knocknacran Mine site will be restored to close to its original ground level for agricultural use. This agricultural land will consist of regular-sized fields bordered by field boundaries consisting of native vegetation; compatible and consistent with the topography, land use, field sizes and field boundaries of agricultural lands bordering the Site within the central study area. Such a restoration will reduce any long-term or lasting visible presence of the excavation on the landscape and will help facilitate the re-establishment of pasture, and its accompanying ecological habitat. This land will be dressed with ca. 0.3 m of topsoil (originally stored in stockpiles from the Knocknacran West excavation) and re-seeded with an agricultural grade grass seed mixture.	Restoration/Closure Phase

LV7	The proposed Knocknacran West Mine open-cast void will never be revealed in its entirety as a completely excavated pit with bare faces. By the time that the later phases (immediately dur north pf the R179) of the Knocknacran West Mine Site are excavated, the earlier phases of the excavation immediately due south of the L4900 will have been restored. The majority of all works, including vehicular movement, will take place in a visually obscured area towards the pit floor, and so will have reduced visual effects beyond the mine area.	Operational and Restoration/Closure Phase
LV8	Physical stabilisation of slopes through precise profiling and contouring.	Restoration/Closure Phase
LV9	Removal and remodelling of any conspicuous, 'unnatural-looking' localised contour profiles to ensure they seamlessly 'marry-in' with existing/undisturbed contour profiles.	Restoration/Closure Phase
LV10	All fixed plant, infrastructure and detritus will be permanently removed off-site.	Restoration/Closure Phase
	NOTE: Any further mitigation measures related to Landscape detailed within authorisation or consents to be included in this section and adhered to.	

Table 19.11: Specific Environmental Mitigation Requirements - Traffic and Transport

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
TT1	Relocation of the existing Knocknacran Mine entrance to maximise sightlines to the south of the access onto the L4816. A new proposed mine access will provide 90 m sightlines to the south, which is consistent with the prevailing 85%ile speed (60-63kph) recorded on the L4816.	Construction and Operational Phase
TT2	New Stop sign and associated road markings to be provided at the Mine Access.	Construction and Operational Phase
TT3	Cutting back of vegetation and tree canopy that is currently reducing visibility to the Stop sign at the L4816/R179 T-Junction.	Construction and Operational Phase
	NOTE: Any further mitigation measures related to Traffic and Transport detailed within authorisation or consents to be included in this section and adhered to.	

Table 19.12: Specific Environmental Mitigation Requirements - Archaeology and Cultural Heritage

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
ACH1	Due to the possibility of the survival of previously unknown subsurface archaeological deposits or finds within the unstripped part of the new proposed mining area (Knocknacran West Mine site) in all areas except No. 28 topsoil-stripping in the application area should be archaeologically monitored.	Construction and Operational Phase
	NOTE: Any further mitigation measures related to Cultural Heritage detailed within authorisation or consents to be included in this section and adhered to.	

Table 19.13: Specific Environmental Mitigation Requirements - Material Assets

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
MA1	All works to the electrical power lines, gas network, water network and telecommunications network during the construction phase will be carried out in accordance with appropriate requirements and guidelines. Locations and capacity of the network services will be agreed in consultation with relevant service providers.	Construction Phase
MA2	Screening will be put in place as part of the Knocknacran West Mine development and proposed Community Sports Complex to assimilate the developments into the landscape. In the case of Knocknacran West Mine this will also provide mitigation until final restoration is completed.	Construction and Operational, Restoration/Closure Phase
MA3	Signage will be maintained and erected within the Mine Site to maintain a safe and orderly traffic regime on the Site.	Construction and Operational Phase
MA4	Pre-construction consultation and authorisation will be achieved for all of the relevant infrastructure connections.	Construction Phase
MA5	Any works required to Material Assets on or around the Site will be carried out in conjunction with the relevant provider to ensure minimal disruption to the existing users.	Construction and Operational Phase
MA6	Any works required to Material Assets on or around the Site will be carried out strictly in accordance with the relevant provider's Code of Practices.	Construction and Operational Phase

MA7	The appointed Main Contractor will be required to produce a CEMP(s) which will document appropriate procedures and responsible persons when working on and around utilities and services infrastructure within and around the Site.	Construction Phase
MA8	Efficiencies in water usage should be considered throughout the engineering design and construction phase of the Proposed Development.	Construction and Operational Phase
MA9	Any processing plant and / or mobile plant on the mine sites will be regularly maintained and kept in good working order, plant will also be regularly maintained and kept in good order on the proposed Community Sports Complex site.	Construction and Operational Phase
MA10	Measures to minimise dust, noise and vibration impacts at nearby residences (already in place for dust on the Knocknacran West site) will continue (and be added to for Knocknacran West Mine) to be implemented.	Construction and Operational Phase
MA11	Mitigation measures for environmental indicators are already in place at the existing Knocknacran Mine and are included in the Environmental Management System (EMS) procedures. The effective implementation of these mitigation measures will continue to be monitored and will encompass Knocknacran West Mine in the EMS.	Construction, Operational and Restoration/Closure Phase
MA12	Non-marketable materials (i.e. mudstone and dolerite) will be utilised in phased restoration activities on the mine sites.	Restoration/Closure Phase
MA13	A qualified mine manager will ensure compliance with relevant safety and statutory legislation and best practices as set out in the HSA's 'Guidelines to the Safety, Health and Welfare at Work (Quarries) Regulations 2008', and other relevant statutory and industry guidelines from Government Departments and the EPA for the mine sites.	Construction, Operational and Restoration/Closure Phase
	NOTE: Any further mitigation measures related to Material Assets detailed within authorisation or consents to be included in this section and adhered to.	

Table 19.14: Specific Environmental Mitigation Requirements - Major Accidents and Disasters

Mitigation No.	Description of Mitigation Measure / Environmental Commitments	Stage of Proposed Development
MAAD1	Activities will be managed in accordance with a Construction Environmental Management Plan (CEMP).	Construction Phase

MAAD2	Instability and Failure of Open-Cast Faces - The current slope angles are designed to ensure that the risk of slope failure is effectively eliminated by using a suitable safety factor. In addition, on-going geotechnical monitoring by means of extensometers will continue throughout the life of the mine along the adjacent R179 and L4900 roads.	Construction and Operational Phase
MAAD3	Instability and Failure of Public Road Infrastructure - A Trigger Action Response Plan (TARP) has been developed for both the L4900 and R179 to provide an early warning system of potential failure of the gypsum roof beams associated with the underground mine workings that lie below the carriageways of the L4900 and R179, and the potential migration of instability to surface that might affect the stability of the road. This will act as an early warning system to identify potential arising problems and will allow for mitigation measures to be implemented before a major event can occur.	Construction, Operational and Restoration/Closure Phase
MAAD4	The future monitoring programme at the Application Site will include on-going monitoring of underground pillar integrity along the R179 and L4900, subsidence monitoring and regular stability surveys of the open-pit slopes (and benches).	Construction, Operational and Restoration/Closure Phase
MAAD5	Emergency response provision will be maintained on Site and updated accordingly with the Site's management practices. SGMI's emergency response planning will cover all foreseeable risks on site. Appropriate training for site personnel will be maintained, including the incident and rescue teams, as well as first aiders and fire marshals. In addition, appropriate staff will be trained in environmental issues and spill response procedures.	Construction and Operational Phase
	NOTE: Any further mitigation measures related to Major Accidents and Disasters detailed within authorisation or consents to be included in this section and adhered to.	

19.3 Monitoring Proposals

A number of environmental monitoring activities are to be continued during the construction, operation and restoration/closure phases. These monitoring activities are required to confirm the effectiveness of the mitigations, to define the quality of the surrounding environment, and to establish if there are any trends in environmental parameters.

Environmental monitoring will be a combination of prescriptive monitoring required as per permitting conditions, and additional monitoring carried out as deemed necessary to successfully manage the business. The proposals for mitigation have been informed by the previous experience of the management team at the existing Knocknacran Open-Cast Mine.

Environmental monitoring requirements have been identified in the specific chapters of the EIAR. The frequency of these monitoring requirements has been collated and provided in a schedule displayed in Table 19.15. Operational phase limits will be reviewed and agreed as part of the licence revision with the EPA and relevant stakeholders.

The existing EMS (Environmental Management System) for the Site will continue to be maintained and updated, with regular environmental monitoring of noise, vibration, dust, water quality and water discharge to ensure that they remain within permitted levels for the life of the mine, pending future IE Licence agreement with the EPA for the Knocknacran West Mine Site.

Activities on the Site will adhere to EU and National Guidelines, and Legislation where applicable, and also follow Best Available Techniques (BAT) to prevent and minimise emissions and impacts on the environment.

However, Emission Limit Values (ELVs) will be set by the Competent Authority; in terms of the Construction Phase of the Development this will be the Local Authority, and in terms of the Operational and Restoration Phases of the Development this will be the EPA (or when the activities on the site become licensable activities).

Table 19.15: Monitoring Commitments for the Proposed Development

Type of Monitoring	Details	Location	Method/s	Survey Frequency	Limit/Trigger or Control	Submitted to	Reporting Frequency	Document Submitted
Blasting/Vibration	Monitoring of Knocknacran West Open-Cast Mine Blasts	IE licenced locations indicated on Figure 19.2 of the EIAR within the mine site, to be finalised and agreed with the EPA. Monitoring will also be undertaken at proximal receptors to blasts.	Vibrograph	Every Blast	Within the IE Licence – 7.5 mm/s ppv and 125 air overpressure 125 dB(Lin) at licenced locations, subject to agreement with the EPA during the licence review	MCC	Monthly	Data results
Subsidence-Drumgoosat Area	Drumgoosat - Field	Beside L4900	Precise levelling	Twice yearly	No adverse change	SRK	Twice yearly	Data results
						DCCAE		SRK Report
	L4900 Road Survey	Drumgoosat Road L4900		Monthly *	TARP for the L4900, Table 5.1 of the L4900 details trigger levels. Medium Risk and High Risk triggers require further investigations. MCC and Dept. informed if there is any change in the TARP risk category (risk categories range from Extremely Low Risk to High Risk). The TARP for the L4900 is Appendix 7.8 of the EIAR.	SRK	Every 3 months	Data results
						DCCAE	Every 3 months	SRK Report
						MCC		
	R179 Road survey	Main Road R179		Monthly *	TARP for the R179, Table 5.1 of the R179 details trigger levels. Medium Risk and High Risk triggers require further investigations. MCC and Dept. informed if there is any change in the TARP risk category (risk categories range from Extremely Low Risk to High Risk). The TARP for the R179 is Appendix 7.7 of the EIAR	SRK	Every 3 months	Data results
						DCCAE	Every 3 months	SRK Report
						MCC		
	Drone Survey	Drumgoosat Area - see map	Drone Photogrammetry	Monthly *	No adverse change	DCCAE	Monthly	Data results/ photo image
						MCC	Monthly	Data results/ photo image
	Laser Scanning	R179	Laser scanning	selected holes - Annual	TARP for the R179, Table 5.1 of the R179 details trigger levels. Medium Risk and High Risk triggers require further investigations. MCC and Dept. informed if there is any change in the TARP risk category (risk categories range from Extremely Low Risk to High Risk). The TARP for the R179 is Appendix 7.7 of the EIAR	SRK	Annual	Results
						MCC / DCCAE		Report
		L4900		Selected holes - Annual	TARP for the L4900, Table 5.1 of the L4900 details trigger levels. Medium Risk and High Risk triggers require further investigations. MCC and Dept. informed if there is any change in the TARP risk category (risk categories range from Extremely Low Risk to High Risk). The TARP for the L4900 is Appendix 7.8 of the EIAR	SRK	Annual	Results
						MCC / DCCAE		Report
Water	Piezometers	Mine site area as outlined in Figure 19.1 of the	Dip meter	Monthly	Compliance with European Communities Environmental	MCC	Monthly	Data results

		EIAR, subject to agreement with the EPA during the licence review process	Dip meter & water samples	6 monthly	Objectives (Groundwater) Regulations 2010, S.I. No 9 of 2010. However, given the unique geology of the mine site, a trigger level review is currently ongoing (as part of the existing IE Licence conditions) to determine appropriate trigger levels compared to the Groundwater Regs. for the mine site. This is subject to EPA approval.	EPA	Twice Yearly	
	Emissions to Water	MSE1/ CP1	Continuous online water monitoring system with Discreet Grab sampling programme	Continuous	MSE1 (IE Licence, subject to agreement with EPA during licence review, limits below to be read in conjunction with note definitions defined in the IE Licence): • Water level monitoring in holding tank and lagoon (IE Licence). • Maximum volume in any one day to be emitted from holding tank - 12,240 m3 • Maximum volume in any one hour to be emitted from holding tank – 510 m3 • Temperature – 1.5oC (max increase)[Note 2] • pH - 6 -9 • BOD - 2.6 mg/l • COD - 40 mg/l • Suspended solids – 25 mg/l • Settleable solids – 5 ml/l • Total Ammonia (as N) – 0.14 mg/l • Molybdate Reactive Phosphorus (as P) – 0.075 mg/l • Total Phosphorus (as P) – 0.062 mg/l • CopperNote 1 – 0.03 mg/l • Manganese – 0.25 mg/l • ChromiumNote 1 – 0.0047 mg/l • NickelNote 1 – 0.02 mg/l • Mineral oil – 0.3 mg/l • Chlorides – 200 mg/l CP1 (IE Licence, subject to agreement with EPA during licence review): • Conductivity – Daily AverageNote 1 1,370 µs/cm • Sulphate (as S04) – Daily Avg. 625 mg/l, Monthly Avg.Note 2 500 mg/l, Annual Avg.Note 3 400 mg/l. • Barium – MonthlyNote 4 0.1 mg/l Subject to EPA IE licence review	EPA	MSE1 – as per IE Licenced schedule CP1 – as per Licenced schedule	Data results
	Drumgoosat water	Drumgoosat Mine water levels	Dip meter	Twice weekly	No adverse change	Mine Manager	3 monthly	
		Water pumped from Drumgoosat	Water chemistry (sulphate/ conductivity)	2 weekly when pumping	No adverse change			

Dust	Dust emission from Mine site during operations.	Subject to agreement on mine site locations shown in Figure 19.2 of the EIAR with the EPA during the IE licence review process	Dust Jar	Monthly	IE licence - 350 mg/m^2/day at licenced locations. Locations to be confirmed during the EPA IE licence review.	MCC	Monthly	Data results
Ambient	PM_{10}/$PM_{2.5}$ monitoring on the Knocknacran West site	Subject to agreement on mine site location shown in Figure 19.2 of the EIAR with the EPA during the IE licence review process	Continuous monitoring	Continuous	Subject to agreement with the EPA – to be in line with air quality standards specified by the CAFE Directive 2008/50/EC for annual mean	EPA	Annual	AER Report
Noise	Noise emission from Mine Site during operations.	Subject to agreement locations shown in Figure 19.2 of the EIAR with the EPA during the IE licence review process	24hr period 24hr & 15 minute attended	Monthly Monthly	As per NG4 guidance. Subject to agreement with the EPA during the IE licence review.	MCC	Monthly	Data results
Perimeter Fence inspections	Perimeter fence inspections	Perimeter Fence around mine site	Walkover survey	6 monthly	If damage or wear is observed, then fencing to be repaired.	Mine Manager	6 monthly	Report
Construction Environmental Management Plan(s) (CEMP)	This will outline the general activities required for the construction phase.	Mine site and Community Sports Complex	Written Plan	Prior to works and during works (continuous)	Controls to be outlined within the CMP for agreement with MCC prior to construction works. Construction noise limits proposed to Category A of the ABC method. Dust limits proposed to be 350 mg/m^2/day.	MCC	Prior to works commencing	CEMP

AER	Annual Environmental Report	IE Licence Area	Written report	Annual	Document provides reporting on environmental status and compliance of the mine site for the previous year, as part of the IE Licence requirements.	EPA MCC	Annual	AER Report
Emergency Plan	Emergency response plan for the mine site	Mine sites	Written Plan		Plan provides detail on procedures in the event of an emergency that are to be followed at the mine site.	Mine Manager	Annual	Emergency Plan
Waste Management Plan	Waste management plan for the mine site	Mine sites	Written Plan		Plan provides detail on procedures to manage waste on the mine site.	Mine Manager	Annual	Waste Management Plan
Extractive Waste Management Plan	Extractive waste management plan for the mine sites	Mine sites	Written Plan		Plan provides detail on procedures to manage extractive waste on the mine site.	Mine Manager	Annual	Extractive Waste Management Plan
Water Management Plan	Reviewed Plan submitted to EPA	Mine Site	Written report	Annual	Document provides reporting on water management and control as part of the IE Licence requirements.	EPA	Annual	Water management Plan
Closure, Restoration and Aftercare Management Plan (CRAMP)	Annual CRAMP	IE Licence Area - Mine sites (to include future Knocknacran West site) and processing site in Kingscourt	Written Plan		Plan provides detail on the procedures to be followed once mining ceases to ensure the site is restored. It outlines the financial cost that closure will cost and is updated annually for the EPA.	EPA	Annual	CRAMP
ELRA	Environmental Liabilities Risk Assessment	Mine Site	Written report	Annual	Document provides reporting on water management and control as part of the IE Licence requirements.	EPA	Annual	Environmental Liabilities Risk Assessment

* Frequency varies as agreed with MCC and DCCAE.

Environmental monitoring requirements have been identified in the specific chapters of the EIAR and are summarised below.

19.3.1 Population and Human Health

Monitoring for the protection of population and human health during the operational and restoration phase will be carried out in accordance with the wider environmental monitoring programme for the protection of water, air quality, noise and vibration.

Further monitoring in respect to site Health and Safety during the construction stage will be identified in the CEMP to be prepared and approved prior to construction.

The Knocknacran West Mine Site is currently subject to ongoing monitoring and management. In the case of the R179 and L4900, a Trigger Action Response Plan (TARP) (Appendices 7.7 and 7.8 respectively) have been put in place based on real-time monitoring of extensometers installed into the underlying bedrock (through a series of boreholes) to provide an early warning system of potential failure of the gypsum roof beams associated with the underground mine workings that lie below the carriageways of the R179 and L4900, and the potential migration of instability to surface that might affect the stability of the road.

19.3.2 Biodiversity

The flow of water from the holding tanks to the River Bursk is monitored on a real time basis from the Site Administration Building. Any discharge water will be strictly monitored and only discharged once in compliance with the IE Licence P0519-04. The River Bursk is subject to regular monitoring to ensure the maintenance of water quality of the river and to ensure that the water quality 70 m downstream of the discharge point on the river complies with IE Licence P0519-04.

Monitoring of surface and groundwater will also be undertaken, as defined in the Water section below.

19.3.3 Land, Soils and Geology

As part of the construction and operational management of the Proposed Development and mining activities, the following systems/procedures and documents will be put in place:

- Emergency Plan (EP) (Appendix 3.7);
- Waste Management Plan (WMP) (Appendix 3.5);
- Extractive Waste Management Plan (EWMP) (Appendix 3.6); and
- Closure, Restoration and Aftercare Management Plan (CRAMP) (Appendix 3.3).

The future monitoring programme at the Application Site will include on-going monitoring of underground pillar integrity along the R179 and L4900, subsidence monitoring and regular stability surveys of the open-pit slopes (and benches).

The existing benches at Knocknacran are regularly monitored for instability and the Proposed Development at Knocknacran West will also be regularly monitored. Continuous monitoring will be undertaken of ground stability throughout the life of the proposed mine and specific measures will be controlled through EMS procedures and IE Licencing requirements for the Site.

19.3.4 Water

Surface water quality monitoring is carried out at 3 locations (Figure 19.1) in accordance with IE Licence P0519-04:

i) MSE-1 (at outfall from holding tank to the River Bursk);

ii) B (baseline conditions in the River Bursk at 5 m upstream of the discharge point to the River Bursk); and

iii) CP-1 (conditions 70 m downstream of the discharge point to the River Bursk).

Periodic (non-continuous) monitoring is carried out by grab sample at these sampling points. The analytical programme uses a tiered approach, whereby some parameters are analysed continuously, daily, monthly, quarterly, and biannually at various locations. Sample analysis can include dissolved oxygen, suspended solids, settleable solids, electrical conductivity, pH, temperature, sulphate, barium, nitrate, ammonia, BOD, COD, total phosphorus, mineral oil, manganese, chloride and total metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, tellurium, thallium, and tin). Specific sample analysis schedules are detailed for each location in IE Licence P0519-04. As the Proposed Development will continue to use the existing licenced water management system, it is envisaged that the future licence revision will be in keeping with the existing licence parameters for surface water monitoring points.

Ongoing (real-time) monitoring of surface (mine) water discharge to the River Bursk will continue to take place in compliance with IE Licence P0519-04. Electrical conductivity, sulphate and flow are monitored on a daily basis at MSE-1. Electrical conductivity and sulphate are monitored on a monthly basis at location B (5 m upstream of the discharge point). Electrical conductivity and sulphate are also monitored on a daily basis at compliance point CP-1 (70 m downstream of the discharge point).

The Applicant carries out groundwater monitoring onsite, at both upgradient and downgradient wells. Monitoring is specified for pH, electrical conductivity, COD, calcium, sulphate, ammonia, chloride, manganese, barium, TPH, nitrate, sodium, potassium, magnesium and alkalinity. Biannual reports are submitted for groundwater monitoring. Regular monitoring of groundwater (levels and quality) will continue to take place using existing monitoring boreholes in compliance with IE Licence P0519-04 and the Proposed Development will incorporate additional wells on the Knocknacran West Open-Cast Mine site.

Monitoring will also be undertaken at three additional surface water monitoring locations on the Corduff Stream and the Magheracloone Stream.

Monitoring will be undertaken on the Magheracloone/Lagan catchment twice yearly for quality to build up an improved profile of the river with sampling taking place at the location of “SW Flow A”.

Figure 19.1 also shows the locations of additional groundwater and surface water monitoring locations for the Proposed Development. Several well locations shown on Figure 19.1 include wells at varying depths at one location (i.e. multiple wells at one location are monitored).

19.3.5 Air Quality and Climate

Dust monitoring will continue to be carried out monthly at the designated monitoring locations. It is recommended that daily on and offsite inspection take place, where receptors are nearby. There should be a higher frequency of site inspections by the person responsible for air quality and dust monitoring on-site

when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

An ambient monitoring station (i.e. PM10 and PM25 will be established on the Knocknacran West Mine site for the operational life of the mine, this will be agreed in consultation with the EPA during a licence revision of the existing IE licence).

Once the Proposed Development is operational it is proposed that indicative locations such as those shown on Figure 19.2 will be used for monitoring of activities at the Knocknacran West and Knocknacran mine sites. The locations will be subject agreement as part of a revision to the IE Licence with the EPA.

19.3.6 Noise

It is anticipated that the Knocknacran West Mine will be integrated into the existing IE Licence. Noise monitoring will be conducted at several proposed locations, subject to agreement with the EPA. It is proposed that 4 locations will be monitored for noise in and around the Knocknacran West Mine Site, in addition to the three existing locations on the Knocknacran Mine Site (Figure 19.2).

19.3.7 Vibration

It is proposed that the blasting of materials will meet the current maximum vibration limit of 7.5 mm/s ppv and air overpressure limit of 125 dB(Lin) as permitted in IE Licence P0519-04. Blasting will be carried out by trained personnel to ensure these limits are adhered to.

Blast monitoring locations (vibration and air overpressure) will be formally agreed with the EPA as part of a future IE Licence revision; however, it is currently proposed that monitoring locations will be set up at the northern, western, eastern and southern boundaries of the site (indicated locations are presented in Figure 19.2). It is also proposed that monitoring at 3rd party residential dwellings and commercial/amenity facilities (dependent on their proximity to blasts) will be carried out as is currently undertaken for existing mining operations.

Subject to later agreement with the EPA as part of a later licence review, it will be proposed that the existing blast monitoring locations (MS1-MS3 as identified within IE Licence P0519-04) which are used to monitor blasting in Knocknacran Open-Cast Mine would no longer be used once Knocknacran West Open-Cast Mine is operational, as the former open-cast will be restored, and no blasting will take place here.

19.3.8 Landscape and Visual

No monitoring is deemed necessary in relation to Landscape and Visual.

19.3.9 Traffic and Transport

No ongoing monitoring is proposed for traffic and transport related impacts or mitigation.

19.3.10 Archaeology and Cultural Heritage

Topsoil-stripping in the Application Area should be archaeologically monitored due to the possibility of the survival of previously unknown subsurface archaeological deposits or finds within the unstripped part of the new proposed mining area (except in Area No. 28, where recent subsidence events have occurred; Plate 15.5, Appendix 15.3).

19.3.11 Material Assets

Any monitoring associated with authorisation or consents (e.g. construction discharges or those associated with operational activities) will be incorporated into the CEMP and EMS and will be adhered to.

19.3.12 Major Accidents and Disasters

On-going geotechnical monitoring by means of extensometers will continue throughout the life of the mine along the adjacent R179 and L4900 roads. Implementation of the Trigger Action Response Plan (TARP) for each of the roads involves an early warning system of potential failure of the gypsum roof beams associated with the underground mine workings that lie below the carriageway of the L4900 and R179. On-going monitoring of underground pillar integrity beneath the R179 and L4900, surface subsidence monitoring and regular stability surveys of the open-pit slopes (and benches) will also be undertaken.

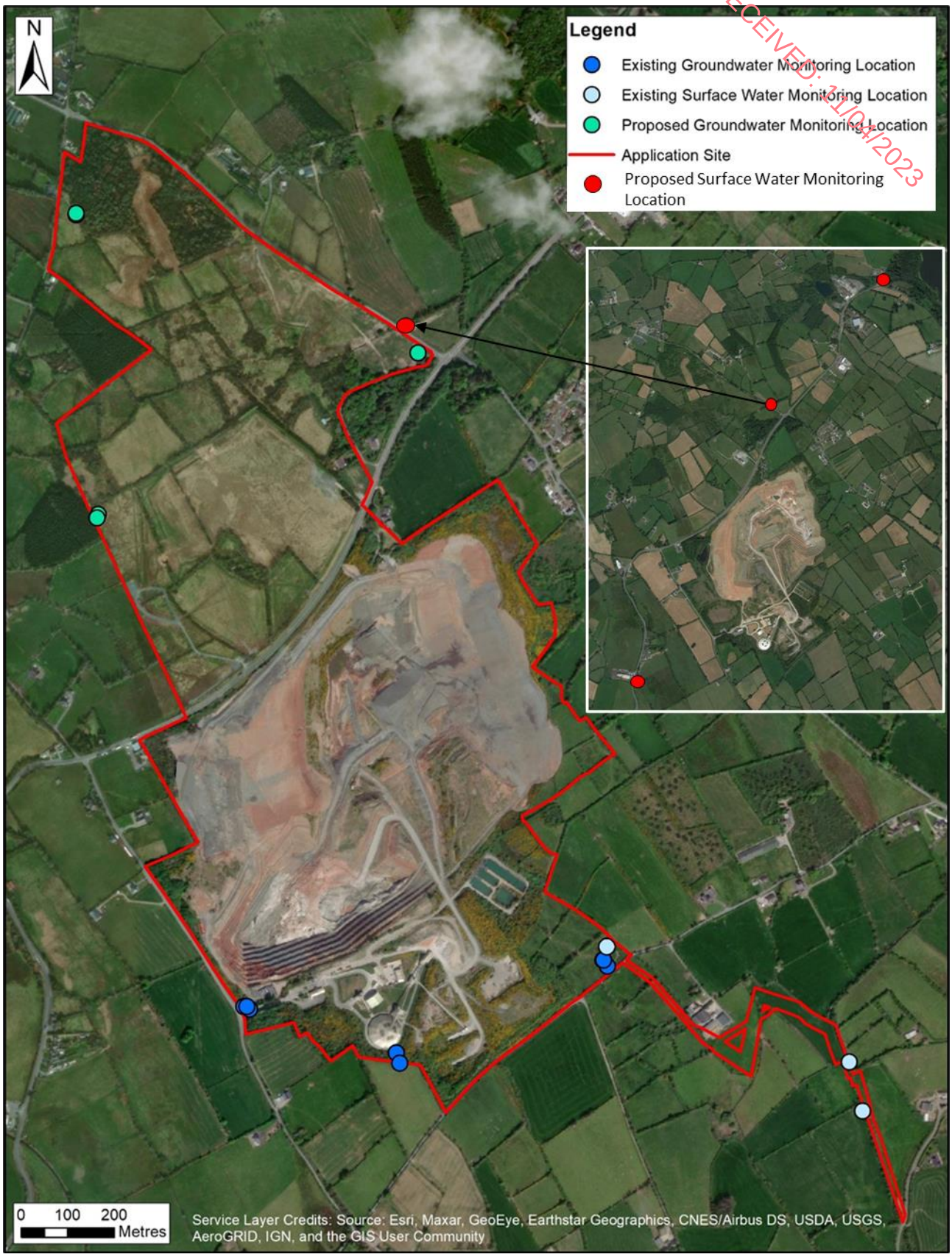

Figure 19.1: Water Monitoring Locations

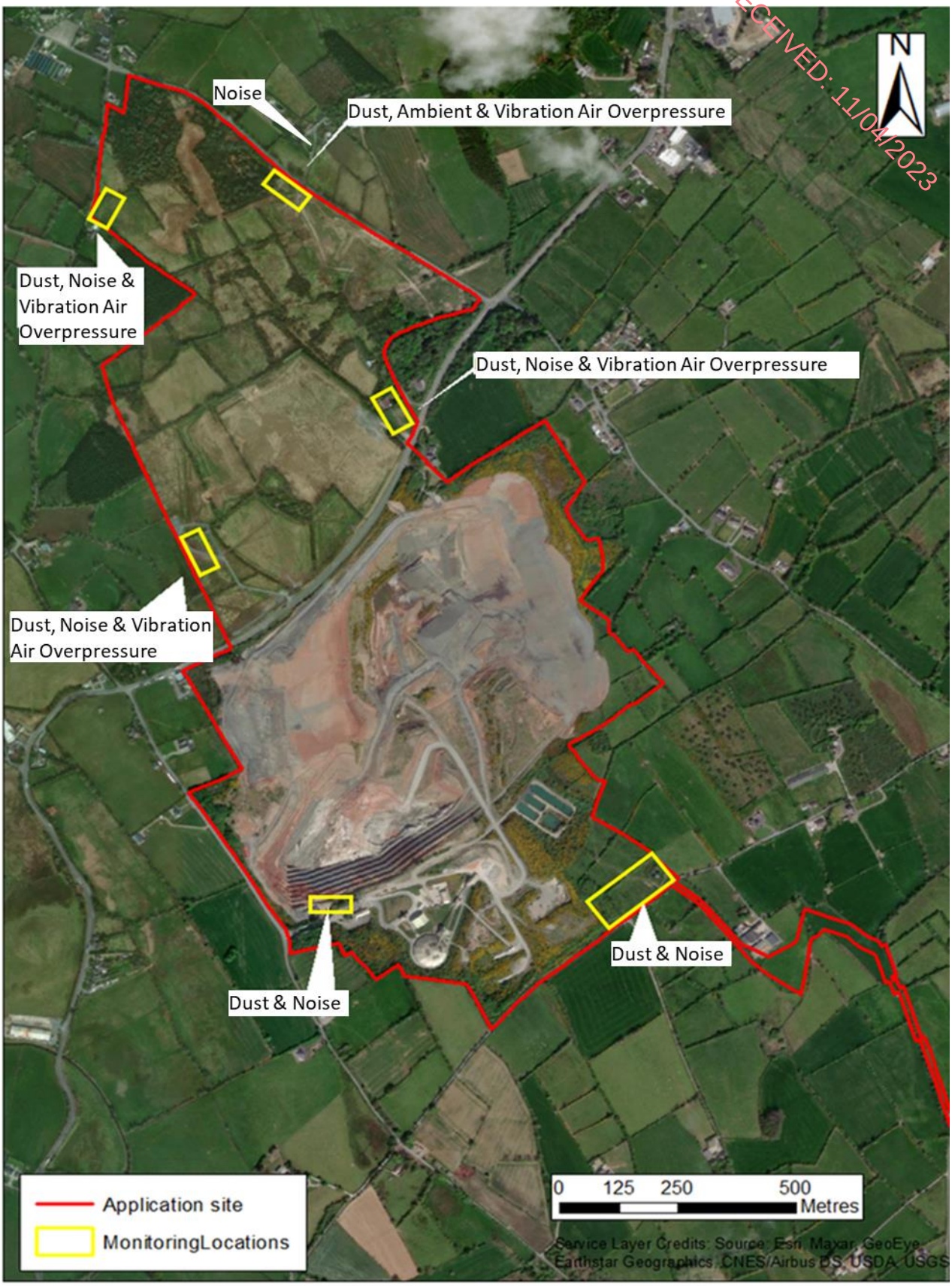

Figure 19.2: Dust, Noise and Vibration Monitoring Locations

19.4 Complaints Register

SGMI will continue to maintain a Complaints Register. This register will record complaints in relation to the operation of the mine and associated infrastructure. Each entry will record the date and time of the complaint, the name of the complainant (if provided), and will give details of the nature of the complaint. A record shall also be kept of any response made in the case of each complaint.

Appendix Number	Appendix Name
Appendix 1.1	Saint-Gobain Integrated Report 2021
Appendix 1.2	Existing CRAMP March 2021
Appendix 2.1	2019 Scoping Report and Scoping Responses
Appendix 2.2	Summarised 2019 Scoping Responses Tables 1 and 2
Appendix 2.3	Summarised Statutory Correspondence from Reg. Ref. 22/34 – Table 1
Appendix 2.4	Summarised Correspondence from MCC during Reg. Ref. 22/34 – Table 1
Appendix 2.5	Community information event flyer September 2021
Appendix 2.6	Issues for EIAR raised during Community Engagement – Table 1
Appendix 2.7	Summarised public submissions (considered relevant from Reg. Ref. 22/34) - Table 1
Appendix 3.1	Final Remediation Report (CQA) for the former GAA Grounds
Appendix 3.2	Suitability Assessment for Knocknacran West Mine Welfare Facilities
Appendix 3.3	Mine Closure Plan (Closure, Restoration and Aftercare Management Plan - CRAMP)
Appendix 3.4	Drainage Report - Community Sports Complex
Appendix 3.5	Design Report - Temporary Road Diversion and Cut-and-Cover Tunnel
Appendix 3.6	Resource Waste Management Plan (RWMP) inc. Asbestos Survey
Appendix 3.7	Interpretative Geotechnical Report - Temporary Road Diversion & Cut-and-Cover Tunnel
Appendix 3.8	Phasing Knocknacran West - Cross Sections
Appendix 3.9	Waste Management Plan
Appendix 3.10	Extractive Waste Management Plan
Appendix 3.11	Mine Emergency Plan
Appendix 3.12	Proposed EPA Licence - Map
Appendix 5.1	Evaluation of the Relevance of “Solastalgia” in the Context of the Proposed Development of the Former (Drumgoosat) Underground Mir by Open-Cast Mining
Appendix 6.1	Knocknacran West Project Habitat Survey August 2021
Appendix 6.2	Knocknacran West Mine Project Ecology Surveys 2022
Appendix 6.3	Knocknacran West Hedgerow Survey
Appendix 6.4	Tree Protection Management Plan
Appendix 6.5	Knocknacran West Project Ecology Surveys 2021
Appendix 6.6	Aquatic Baseline Report for the Corduff Stream, Knocknacran West Project, Co. Monaghan
Appendix 6.7	Proposed Habitat Management Plan - Knocknacran West Project
Appendix 6.8	Landscape Plan - Boundary Treatment Plan Community Sports Complex
Appendix 6.9	Landscape Management Plan Knocknacran West Site
Appendix 6.10	Proposed Environmental Management Plan
Appendix 7.1	Community Sports Complex Borehole Logs - 2021
Appendix 7.2	Subsidence at the former Underground Gypsum Mines (Drumgill & Drumgoosat) near Kingscourt, Co. Cavan, Ireland - SRK - May 1999
Appendix 7.3	Check Survey and Geotechnical Inspections at Drumgoosat Disused Mines - SRK - Mar 2002
Appendix 7.4	Drumgoosat Subsidence Event - Technical Report - SRK - Oct 2018
Appendix 7.5	Independent Review of Investigation into Collapse Workings at Drumgoosat - WAI - Dec 2018
Appendix 7.6	December 2018 Crown Hole - SRK - Apr 2019
Appendix 7.7	Drumgoosat Underground Mine - Investigation & Analysis of mine Stability below the R179 - SRK – Apr 2020
Appendix 7.8	Drumgoosat Monitoring R179 Trigger Action Response Plan (TARP) - SRK Jul 2020
Appendix 7.9	Drumgoosat Monitoring L4900 Trigger Action Response Plan (TARP) - SRK Aug 2019
Appendix 7.10	Independent Review of the Stability Report on the Drumgoosat Underground Mine Workings below and adjacent to the R179 Carrickmacross to Kingscourt Road, Co. Monaghan - Aug 2021
Appendix 7.11	Review of Geotechnical Reports on Ground Stability related to the R179 and L4900 Roads overlying the Knocknacran West (Drumgoosat Gypsum Deposit, Co. Monaghan - Golder - Sept 2021
Appendix 7.12	Knocknacran West Pit Slope Stability Assessment – Golder - Sept 2019
Appendix 7.13	Knocknacran West Mine Assessment, Ireland - SRK - Nov 2019
Appendix 7.14	Impact of Construction and Mining Vibration - SRK - July 2022
Appendix 7.15	Long Term Mine Stability - SRK - July - 2022
Appendix 7.16	Quarrying through Voids - SRK - July 2022
Appendix 7.17	Procedure for mining in the vicinity of suspected voids & unstable ground (underground mine workings) - SGMI - August 2022
Appendix 7.18	Roof Beam Stability and Kinematics - SRK - July 2022
Appendix 7.19	Permanent Solution to Existing Mine workings that go under the Existing Public Road Network - SLR - Sept 2022
Appendix 8.1	Magheracloone & Corduff Stream Hydrology - Piteau - 2022
Appendix 8.2	Aquatic Baseline Report for the Corduff Stream - Triturus - 2022
Appendix 8.3	Analytical Surface Water Quality Data
Appendix 8.4	Analytical Groundwater Quality Data
Appendix 8.5	Estimated Site Water Balance December 2016 August 2021
Appendix 8.6	Mining - Safe Work Procedure - Water Flow Inrush Underground
Appendix 8.7	Knocknacran West Pit Lake Model and Restoration Plan - Piteau - 2021
Appendix 8.8	Hydrogeology Study of Drumgoosat Underground Workings - Piteau - 2021
Appendix 9.1	Saint-Gobain Climate Policy Documents
Appendix 9.2	Saint-Gobain Renewable Energy Certificate
Appendix 10.1	Construction Dust Assessment
Appendix 10.2	Mineral Dust Assessment
Appendix 11.1	SLM Calibration Certificates
Appendix 11.2	Monitoring Data, Photographs and Notes
Appendix 11.3	Modelling Results
Appendix 11.5	Drumgoosat National School Technical Assessment
Appendix 13.1	Photomontages
Appendix 13.2	Landscape Plan - Boundary Treatment Plan Community Sports Complex
Appendix 13.3	Landscape Management Plan Knocknacran West Site
Appendix 14.1	Traffic and Transport Assessment
Appendix 15.1	Record of Monuments and Places (RMP) Sites in the Study Area
Appendix 15.2	Architectural Heritage Assessment Report
Appendix 15.3	Figures and Photographic Plates
Appendix 15.4	Sites in the Sites and Monuments Record in the Study Area
Appendix 15.5	Correspondence regarding the Minor Place Names
Appendix 16.1	ESB Service Routes original maps
Appendix 16.2	GNI Service Routes original maps
Appendix 16.3	Application to connect to the MGWS