

## 5. Engineering and Topography

### 5.1 Introduction

This section of the report highlights the main Physical and Infrastructural constraints within the study area. A study methodology is outlined, followed by a description of the main features under each heading.

### 5.2 Study Methodology

The Engineering features considered as part of the Constraints Study consist of the physical features (topography, river systems and valleys, etc.) and the main infrastructural features (roads, railways, main electricity lines and main gas lines) within the study area. Identification of such constraints was completed primarily as part of a desktop review of the information contained on the Ordnance Survey Discovery Series (1:50,000) mapping, complimented by site visits in the form of windscreen surveys. In addition to this, information was gathered from service providers (Electricity Supply Board and Bord Gais Eireann) in order to supplement the review.

### 5.3 Physical Features

#### 5.3.1 Topography

The general topography of the southern section of the study area can be broadly broken into two areas – north and south of Thomastown.

The north section consists of undulating hills where the land generally varies between 20 – 90 m above Ordnance Datum (AOD). The River Nore Valley sweeps south through the middle of this section from Kilkenny City to the northwest to Thomastown. The Kings River Valley passes from west to east to meet the Nore Valley just northeast of Stoneyford.

The area south of Thomastown is dominated by the steep river valleys associated with the River Nore and its tributary, the Arrigle River, and the South Kilkenny Hills. The generally hilly topography varies between 50 – 100 m AOD with the higher peaks reaching up to 250 – 290 m AOD, as shown on Figures 3A and 3B. The steep, mountainous countryside eases to undulating terrain toward Kilmacow.

The ground elevation in the area north of Thomastown remains below 100 mAOD, however, the South Kilkenny Hills rise to above 200 mAOD over a relatively short distance, and pose a considerable physical constraint in this area. In addition, Tory Hill to the southeast of Mullinavat has similar characteristics. It is considered unlikely that any route through the study area would pass through these raised areas over the 200 mAOD elevation. Therefore, these areas above the 200 mAOD level have been shown as constraints on Figures 3A and 3B.

### 5.4 Rivers and Canals

There are a number of major river systems flowing through the study area. The river and valley systems of the Rivers Nore and Barrow are the most significant river features.

The River Nore flows south through Kilkenny City and across the northern part of the study area, as shown on Figure 3A.

Two of the River Nore's main tributaries, the Kings and Little Arrigle Rivers (flowing from the west and south-west respectively) join the Nore in the general vicinity of Stoneyford and Thomastown respectively. From Thomastown the Nore flows southeast, where it is joined by the Arrigle River.

The River Barrow flows south through the northeastern corner of the study area, forming the boundary between Kilkenny and Carlow Counties. There is a Canal on the River Barrow, in the vicinity of Goresbridge, County Kilkenny. This Canal runs within the southern study area for approximately 6 kilometers along the river, passing through Goresbridge. There are a number of Locks on the Canal, which allow for the regulating of the flow.

The River Blackwater, a tributary of the River Suir, is a feature on the south western side of the study area, as it flows south to meet the River Suir to the north-east of Waterford City, near Granny, as shown on Figure 3B. There are two tributaries flowing into the Blackwater in this area. The Derrylackey River drains from the east into the Blackwater to the north of Mullinavat, while the larger Pollanassa River drains from the west into the River Blackwater to the south of Mullinavat.

Intrinsically linked to the topographical features are the river systems and valleys. At this stage of the study it is mainly the linear nature of the rivers that represents a physical constraint. The associated constraints, such as nature conservation designations, topography, landscape and visual features are each dealt with elsewhere in this study.

## 5.5 Infrastructural Features

### 5.5.1 Existing Major Roads and Railway Network

There are several national primary roads traversing the study area. The N10 Paulstown to Kilkenny road serves as the northern border of the study area before heading southward on the N10 Kilkenny to Ballyhale where it meets the N9. The N9 Dublin to Waterford road passes through the centre of the southern study area, extending southwest from Paulstown and continuing south to meet the N24 Waterford to Limerick road, at Granny, County Kilkenny. The N24 Waterford to Limerick road skirts along the southern boundary of the study area before heading southeast from Granny and leaving the southern study area just north of Waterford City. The N25 Rosslare to Cork road enters the eastern side of the study area near Ballyverneen and heads in a south southwesterly direction before exiting the study area at Belmont. The N29 road serving Waterford Port extends from the N25 at Slieveroe at the southeastern corner of the study area. The only National Secondary road in the study area is the N76 Kilkenny to Clonmel road, which extends southwest from Kilkenny City, leaving the western side of the study area at Washers Bog.

At present the route of the Proposed N25 Waterford By-Pass traverses the southern end of the southern study area. It is part of the brief for this scheme to tie into the N25 Waterford By-Pass at some point along this length, as shown on Figure 3B.

Coras Iompair Eireann (CIE) and specifically Iarnrod Eireann (IA) operate a number of railway lines within the southern study area. Of these lines, one is solely for the purposes of freight transport and the others are passenger lines, as shown on Figures 3A and 3B.

The line operated solely for the purposes of freight transport runs between New Ross on the River Barrow, and Waterford Port, in Waterford City on the northern banks of the River Suir. This line is approximately 20 kilometers in length and roughly runs parallel to the River Barrow.

The main passenger railway line in the area runs from Rosslare, on the County Wexford coast, into Waterford City. This line crosses the River Barrow adjacent to the Great Island power station before arriving in the city. From there it continues to the northwest for approximately 3 kilometers, where it splits into two lines in the vicinity of Granny, County Kilkenny. The westbound line

continues through County Tipperary to Limerick Junction. The northbound line traverses the center of the southern study area to a point approximately 4 kilometers southeast of Kilkenny City, where there is spur line into the city. The line continues to the northeast towards Carlow and on to meet the Cork to Dublin line to the west of Kildare Town.

### 5.5.2 Electricity Supply Network

The Electricity Supply Board (ESB) has a number of electricity supply lines running through the southern study area. The main concentration of lines is in the southern part of County Kilkenny. This is due to lines emanating from the ESB power station at Great Island, County Wexford. This power station is on the Suir Estuary, approximately 7 kilometers downstream and to the east of Waterford City, as shown on Figure 3B.

Three 110kV overhead lines are routed across the river Barrow at Loughtown, County Wexford, and then continues west into the southern study area. Each of these lines crosses the railway line and the N25 National Primary Road in this area. Two of these lines turn to the south and terminate on the northern side of the River Suir, adjacent to Waterford City. The third line turns to the north and proceeds north through the eastern side of the entire southern study area.

There is also a 220kV overhead line emanating from Great Island, which follows the route of the 110kV lines until they deviate north and south, whereby the 220kV line continues to the west. This line crosses the existing N9 National Primary Road approximately 4 kilometers northeast of Waterford City, before crossing the N24 National Primary Road and the River Suir into County Waterford.

### 5.5.3 Gas Supply Network

Bord Gáis Éireann (BGE) has a national transmission network for serving the country's major gas demand centres. Three BGE gas transmission pipelines traverse the southern study area, i.e. the Cork to Dublin pipeline, a spur line into Kilkenny City and the Baunlusk to Ballyragget pipeline, as shown on Figure 3A.

The Cork to Dublin pipeline crosses north County Kilkenny, to the south of Kilkenny City, in roughly a southwest to northeast direction. This pipeline crosses the N9 National Primary Road approximately 4 kilometres south of Kilkenny and continues to the River Barrow from where it heads north. This pipeline is within the southern study area for approximately 18 kilometers of its length.

The spur line into Kilkenny City is approximately 3 kilometres in length and running from the Loughboy Above Ground Installation (AGI) on the southern end of Kilkenny City, parallel to the N10 National Primary Road, until it joins the Cork to Dublin pipeline.

The Baunlusk to Ballyragget pipeline runs from Baunlusk AGI in roughly a northwestern direction to Ballyconra AGI, approximately 22 kilometres away in north County Kilkenny.

## 5.6 Tie-in Constraints

The proposed Waterford Bypass provides a new N9 connection in the vicinity of Granny. It is proposed that options for the new N9 between Kilcullen and Waterford tie-in at this point.

There are clear advantages with a connection at Granny but it is believed that more engineering and traffic information is needed to understand the full implication of any such connection. Junction options further the east along the Waterford Bypass are therefore still being considered at this stage of the scheme planning.