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WATERFORD
CITY ENGINEER
T. Mackey
BE, CEng, FIEI**

**N25 WATERFORD BYPASS ENVIRONMENTAL
IMPACT STATEMENT**

NON-TECHNICAL SUMMARY

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**RPS Consultants Ltd
Grattan Court
29-31 Washington Street West
CORK**

**Tel: 021-276266
Fax: 021-276224**

**Ewbank Preece O hEocha
Consulting Engineers
2 Lee House
Riverview Business Park
Blackrock
CORK**

**Tel: 021-2302000
Fax: 021-2302050**

**Tramore House
Regional Design Office
Tramore
CO. WATERFORD**

**Tel: 051-390130
Fax: 051-390699**

This report has been prepared by RPS Consultants Ltd

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NON-TECHNICAL SUMMARY

INTRODUCTION

This is a non-technical summary of the Environmental Impact Statement (EIS) for the proposed Waterford Bypass. It draws attention to the most important issues and provides information on other significant topics. Any topic which causes concern can be followed in greater detail in the main EIS.

PROJECT DESCRIPTION

Waterford County Council, Waterford Corporation and Kilkenny County Council propose to construct a new bypass of Waterford City. The proposed scheme involves an 18 km bypass route incorporating a new bridge over the River Suir, and 8 km of associated link roads.

The Need For The Scheme

The need for a second river crossing of the River Suir in Waterford has been recognised over many years. The N25 (part of the E30 Euro Route) connects Cork at one end to the port of Rosslare at the other end, via Waterford City. The existing route at Waterford goes right through the city travelling along the congested city quays and crossing the River Suir over Rice Bridge - an opening span bridge which is required to open for shipping. The existing traffic volumes and the anticipated growth in traffic suggests that a new bypass and crossing of the river is needed.

Alternatives Considered

A feasibility study was carried out to identify feasible routes and crossing locations, evaluate and quantify the costs and benefits associated with these schemes, recommend a new crossing and approach roads, and examine the justification of the scheme. A recommended road network was selected, taking account of economic rate of return, Waterford City traffic performance, National Primary Route traffic performance, outline environmental examination, and the projected development of Waterford City and environs.

A Route Selection Report was then prepared which examined various route options within a route corridor based on the recommended road network identified by the feasibility study. To make effective comparison of the route options, the study area was divided into four sections (see Figure 1).

- **Kilmeaden Section.** Nine route options, and modified versions of two of these options, were assessed for this section. Five options were eliminated due their negative impacts on the local community at Matthews Cross. One option was eliminated due to its negative impacts on Mount Congreve Gardens. At that stage, two options remained. Modified versions of these options were developed, and a preference was established for one due to the impacts of the other modified option on the Mount Congreve demesne and gardens. In order to address some of concerns which remained about the preferred modified option, further modifications of this route were developed as a new option, and this option was selected as the preferred route.
- **Western Section.** One proposed route was put forward for the Western Bypass and Western Link. In general, this route involves few engineering or environmental considerations of

major significance. The significant environmental impacts identified are either common to any route alignment in this section, or can be mitigated. Therefore, these routes were selected as the preferred routes for the Western Bypass and Western Link.

- **Suir Crossing Section** Three horizontal alignment and five vertical alignment options were assessed for this section. Engineering considerations indicated a clear preference for one of these routes due to ground conditions, road safety, connectivity, navigation clearance and construction costs. This route was selected as the preferred route. Due to the engineering considerations and the large number of environmental constraints in this area, it was not possible to select a route which avoided significant potential environmental impacts.
- **Northern Section.** Three options were assessed for this section. There was no clear preference for any particular route on environmental grounds in this section. The preferred route was selected on engineering grounds for the following reasons: it bypasses the village of Slieverue; it is the best option for port traffic; and it would allow future grade separation of the tie-in with the existing N25 and continuity of the line.

Two structural forms were considered for the new River Suir Bridge: a Girder Bridge and a Cable-stayed Bridge. For most of the environmental issues considered in this EIS, the precise nature of the bridge design does not have a significant effect on the potential impacts of the scheme. However, the cable-stayed bridge would have significantly less impact on water quality and fisheries, as there is no requirement for construction of piers in the main river channel. The cable-stayed bridge would also have positive landscape impacts as it would become a feature of the landscape, offsetting the scenic quality against the engineering structure, while the girder bridge designs would have negative or neutral impacts. The girder bridge would have a lower navigation clearance (c. 12 m) compared to the cable-stayed bridge (c. 14 m). The presence of piers in the river channel with the girder bridge may result in the generation of currents and eddies, and these could interfere with navigation. Therefore, for the three environmental issues where the precise nature of the bridge design could have a significant effect of the potential impacts of the scheme, it is clear that the cable-stayed bridge would have less impact compared to the girder bridge designs considered.

The Proposed Scheme

The scheme has been designated as a Public Private Partnership (PPP) scheme and will operate as a tolled road. The proposed road development is planned to be built by means of a design/build/finance/operate contract. Although this will provide the PPP concessionaire with certain flexibility in design details and construction methods, it is important to note that the concessionaire will be contractually bound by the requirements and mitigation measures set out in the Environmental Impact Statement and by the assessment decision of the competent authority, namely An Bord Pleanála.

The proposed scheme (Figure 2) comprises construction of an N25 bypass from the townland of Ballyduff West, west of Kilmeaden Village, Co. Waterford to the townland of Luffany east of Slieverue, Co. Kilkenny, incorporating a new crossing of the River Suir south of Granny Castle. The scheme also includes:

- a link road (the Western Link) from the new bypass in Knockhouse Upper townland, Co. Waterford to the existing N25 at the western edge of Waterford City;
- realignment of the N24 from Granny Castle to its junction with the N9 (N24 Link);

- realignment of the N9 from Milltown, Co. Kilkenny, to Waterford City (N9 Link and Newrath Link);
- realignment of the R680 from Old Kilmeaden village to the existing N25; and
- realignment of several minor roads.

Technical information about the scheme is summarised in Table 1.

TABLE 1 Summary of technical information.

Length of bypass	18 km
Length of link roads	8 km
Number of road bridges	13
Number of rail bridges	3
Number of river bridges	5
Approximate cost	£145 million

The new River Suir Bridge will be constructed as a Cable-stayed Bridge (Figure 3). A toll plaza will be located on the southern approaches to the River Suir Bridge (Figure 4). The proposed scheme will involve a landtake of 277.2 ha.

Construction

It is anticipated that the construction period will last for 36 months. The anticipated construction period for the River Suir Bridge is 30 months. The construction of the proposed route will require extensive earthworks for embankments and cutting. It is envisaged that, where possible, material excavated from cuttings will be reused elsewhere for embankments. No access routes have been identified for construction traffic, and these will depend upon the sources identified by the contractor for supply and disposal of material. At this stage, it can be assumed that, unless otherwise specified, any of the public roads crossing the proposed route may be used by construction traffic.

Operation

The predicted design year traffic flows are shown in Table 2.

TABLE 2 Design year traffic flows.

Route section	Design year AADT
N25 western tie-in to Western Link	19,973
N25 Western Link to Granny Interchange	40,721
N25 Granny Interchange to Northern tie-in	23,015
Western Link	34,733
N24 tie-in	19,021
N9 Granny Interchange to N9 tie-in	18,189
N9 Newrath Link	18,390

HUMAN ENVIRONMENT

The main settlements in the study corridor are the villages of Kilmeaden and Old Kilmeaden in the Kilmeaden section, ribbon development along the existing N9 and N24 in the Suir Crossing section and the village of Slieverue in the Northern section. In addition, clusters of residential development occur along minor roads throughout the study corridor.

In the Kilmeaden section, the old demesnes of Mount Congreve and Whitfield Court provide a variety of recreational/amenity resources. The disused Waterford-Dungarvan railway line runs through the Kilmeaden and Western sections and provides an informal walking route. It is listed in the Waterford City Development Plan as a Riverside Walk, and there are plans to develop a tourist railway along this route.

The overall impact of the scheme on the Human Environment is likely to be positive, due to the large benefits that will arise from removal of through traffic from Waterford City and the improved traffic and road safety environment. There will, however, be some specific negative residual impacts. These are likely to include:

- increased community severance at a number of locations, in particular around the junction of the Newrath Road with the existing N9;
- reduction in passing trade to retail businesses located outside Waterford City; and
- loss of amenity to the users of the old railway line, due to the proximity of the new road.

AGRICULTURE

The agricultural land in the affected area occupies approximately 2135 ha and approximately 220 ha will be lost under the proposed bypass. The affected area can be generally described as productive farmland. Grassland is the most common land use at 89% followed by horticulture, tillage, commercial forestry and other (residential and industrial) at 4.5%, 3%, 1% and 2.5% respectively. The main grassland enterprise is beef followed by dairy, sheep and equine. The main horticultural product is protected nursery crops followed by apples and soft fruit. At least 123 ha of existing agricultural land is designated for industrial/residential development. The value of the agricultural land is dependent on the proximity to Waterford city.

A small proportion of the agricultural lands will be lost (10% approximately) and therefore the overall impact on agricultural output from the affected area should not be significant. However individual farms will be affected to varying degrees with some farms severely affected.

Access to markets for produce should be enhanced by the new bypass. Access to severed land parcels and in some instances farm yards may be affected. The drainage of some of the lands will be affected. The area of land farmed will be reduced due to land lost under the proposed bypass. Farms will be severed causing increased long term costs and problems with accessing severed land parcels. Disturbance and damage to farms will occur (e.g. removal of shelter belts and field boundaries and disturbance of livestock and standing crops). Farm dwellings will be affected and in some cases removed. Water sources will be affected either temporarily or permanently. Field size and efficiency of farm machinery will be affected.

Possible mitigating measures will vary from farm to farm. Road design features should try to accommodate the provision of adequate access to severed land parcels and farm yards. Adequate drainage outlets should be provided. Alternative water sources may have to be supplied. Where possible remedial work should be carried out to restore damaged field boundaries and shelter belts and damage to soil structure should be rectified. Financial compensation should be considered on a per farm basis for the impacts on the farm; e.g. land lost and permanent damage, reduction in value of farm due to damage and increased long term costs.

ECOLOGY

The River Suir has been proposed as a candidate Special Area of Conservation (cSAC) under the Habitats Directive (92/43/EEC) due, in part, to the occurrence in the Suir of spawning populations of Twaite Shad and Sea Lamprey. In addition, Smelt (an Irish Red Data species) occurs in the lower Suir estuary. None of these fish species are known to, or considered likely to, spawn in the section of the River Suir within the study area. One proposed Natural Heritage Area, Grannyferry pNHA, lies within the study area. This pNHA holds two sites for Meadow Barley, a threatened plant species protected under the Flora Protection Order, 1999; two further sites for this species occur in the study area. These sites are all of national importance due to their populations of this plant species. A nationally rare mollusc, *Mercuria confusa*, occurs at several sites within the Blackwater valley. Other areas of ecological constraint, of local or regional importance, occur at various locations in the study corridor, but particularly along the Blackwater and its tributary in the Suir Crossing section. These comprise mainly areas of semi-natural wetland habitat, and, of generally lesser importance, areas of woodland and scrub.

The proposed route would have a substantial-profound negative impact on the Grannyferry pNHA, through direct removal of around 23% of the site, and potential secondary hydrological impacts on another 17%. Around 75% of the Meadow Barley habitat would be removed. It is proposed to mitigate/compensate these impacts by mitigation of secondary impacts to the remnant sections of the site, translocation of the affected Meadow Barley plants, and creation of compensation habitat.

The proposed route would also impact on several sites holding the nationally rare mollusc, *Mercuria confusa*. The route crossings of the River Blackwater and the Smartcastle Stream will be designed to maintain the existing hydrological conditions upstream and downstream, so as to minimise potential secondary impacts on this species. New areas of reedbed habitat will be created to compensate for the habitat removed. This species is widely distributed in the lower Blackwater valley and occurs in large numbers at several sites away from the proposed route.

Other significant impacts of the proposed route include removal of three populations of the nationally scarce plant species Tubular Water-dropwort and of one population of the nationally scarce plant species Adder's-tongue, removal of two Badger setts, impacts on species-rich calcareous grassland at Grannyquarries, impacts on species-rich marshy grassland at Ballynamona, and increased risks of Badger and Otter road mortalities. Mitigation measures will include creation of new areas of calcareous grassland at Grannyquarries, and provision of Badger and Otter crossings and fencing. The impacts to the Badger setts will be mitigated in consultation with Dúchas.

The proposed route is not considered likely to have any significant negative residual impacts on the Lower River Suir cSAC, providing appropriate mitigation measures are implemented to minimise the potential for water quality impacts.

GEOLOGICAL HERITAGE

The only known features of geological heritage importance within the route corridor occur in the vicinity of the Suir crossing. Grannyquarries are an Area of Scientific Interest of local importance. The Ballyvergin Shale Formation is exposed in the cliffs along the north bank of the River Suir adjoining the quarries. This is an important marker horizon which is rarely exposed in outcrop.

The proposed route will affect Grannyquarries. However, the Geological Survey of Ireland has stated that, as the site has been well documented for mapping purposes, they have no particular reservations about the site being modified. Major road schemes can provide opportunities for improving scientific knowledge of the geological heritage resource through the creation of new rock exposures. This can be facilitated by allowing geologists access during the construction period to examine new rock exposures and by maintaining rock exposures free of vegetation, and providing safe access to geologist, following construction. The Irish Geological Heritage Programme (IGHP) of the GSI will be consulted during the detailed design stage of the scheme, in relation to the treatment of the cuttings in the vicinity of Grannyquarries. During the construction stage, provision will be made to allow access to geologists from the IGHP.

HYDROGEOLOGY

There are very varied geological formations along the proposed route of the Waterford Bypass. The geological structures are complex and this is reflected in the hydrogeology along the route. The aquifers range from Regionally Important to Locally Important Aquifers. The aquifer vulnerability ranges from High to Extreme. Over 50 wells along or adjacent to the proposed route have been located. The wells are used for farm or domestic supply.

The construction of the Waterford Bypass and its subsequent operations could pollute the aquifers unless suitable engineering construction and proper operational methods are used during the construction and operation of the bypass. Sealed french drains will be used for carriageway drainage in areas of high to extreme aquifer vulnerability in order to prevent potentially polluting material entering the aquifers from the proposed route. A small number of wells will be removed during the construction phase and will have to be replaced. A further number of wells on adjacent lands may have their yields reduced and depending on the extent of this they may have to be augmented from public supply or by deepening of the existing well. Based on the available information, the bypass is not likely to affect groundwater supplies to wetlands of ecological importance in the valleys of the River Blackwater and its tributary, the Smartcastle Stream.

Proper engineering, construction and operational procedures will eliminate the potential pollution problems and the removal of wells or reduction in well yields can be remedied by either drilling new wells or replacing them with water from the public supply. The proposed Waterford Bypass can be constructed and operated in a sustainable manner.

WATER QUALITY AND FISHERIES

The main watercourses within the study corridor are the River Suir and its tributaries (the Whelanbridge River, the Dawn River and the Blackwater). Water quality in the main channel of the Suir is typical of estuarine conditions with fluctuating salinities and very high chlorophyll *a* levels. Water quality in the tributaries is generally good and is suitable for salmonid fish.

The River Suir is one of Ireland's premier salmonid rivers with important runs of salmon and a large indigenous population of brown trout. The Blackwater, Whelanbridge and Dawn rivers are all salmonid rivers, which act as important nurseries for these fish for this stretch of the main Suir. The Southern Regional Fisheries Board issues 85 snap-net licences on the Suir, but only about 5-7 licences fish between Granny Castle and Waterford Bridge. There are approximately 5-10 eel licences within the study area, catching an estimated 2.5 tons of eel per annum. Three rare species of fish, namely Twaite Shad, Sea Lamprey and Smelt, are known to occur in the Suir estuary.

Water quality impacts from highways can be broadly categorised under three headings: (i) construction impacts, (ii) operational impacts from routine run-off and (iii) accidental spillages of hazardous materials. Construction phase impacts are typical of those associated with any heavy civil engineering site and relate in the main to solids escapements to water ways, cement run-off and site vehicle oil or fuel loss. Mitigation at this stage will be directed at avoiding and minimising escapement of sediment and soil into watercourses, as well as the prevention of oil or liquid cement spills from construction areas to waterways. A method statement for each of the watercourse crossings will be required from the contractor. This method statement will need to comply with the specified guidelines for minimising or avoiding construction-phase impacts and, with regard to culvert design, with the Department of the Marine and Natural Resources Guidelines. The contractors will also be required to consult with the Southern Regional Fisheries Board in relation to the design and construction of bridges, culverts and channel re-alignments. Monitoring will be required when major works are taking place in the vicinity of watercourses, in particular, after heavy rain. If all the mitigation measures are fully implemented, then construction impacts are not likely to significantly affect the overall fish productivity of these rivers, or significantly affect the rare fish species.

Discharges of routine run-off directly to the main channel of the Suir will probably be very difficult to detect in terms of impact due to the relatively large dilution available to such run-off. Discharges to the River Blackwater and, to a lesser extent, the Smartcastle Stream will be also be subject to relatively large dilution and tidal flushing. With discharges to the remaining watercourses in the area, accumulations of trace contaminants in silts and muds is likely and a reduction in macroinvertebrate diversity downstream of the outlet can be expected. Such impacts would be more significant where the receiving watercourse is of relatively high quality: i.e., discharges to the Dawn River and to the Whelanbridge River. In addition, impacts from discharges into small creeks, just upstream of the boundary of the Lower River Suir cSAC could be of some potential significance. Discharges at outlets along the Blackwater River and Smartcastle Stream are close to wetlands of high ecological importance. In general, treatment systems with a similar level of performance to french drains or sedimentation lagoons will be used as the primary form of treatment of routine run-off for this scheme. Oil/water separators, or alternative systems providing a similar level of treatment, will be used at the end of any sealed pipe sections prior to discharge to surface water. The proposed road drainage system should, if properly designed and maintained, avoid significant impacts from routine run-off to sensitive watercourses.

The proposed bypass will reduce the concentrations of traffic being carried on many of the roads in and around Waterford City, and should, therefore, reduce the likelihood of accidents involving hazardous substances. Risk assessment calculations indicate that two outlets which drain to the Knockhouse Upper Stream, and the combined drainage from five outlets to the River Blackwater

catchment may have risks of a serious spillage of greater than 1 in 100 years. Oil traps capable of handling a tanker spillage will be installed at drainage outlets as required to reduce the serious spillage risk to any receiving watercourse to below 1 in 100 years. Sedimentation lagoons with a controlled outflow (or alternative systems providing similar levels of treatment) will also be used at these outlets, where feasible, to provide increased retention of run-off before discharge to the receiving watercourse, allowing more time for response to a pollution incident.

None of the rare fish species have been recorded as spawning within the study area. Twaité Shad and Smelt are unlikely to spawn in the tributary rivers within the study area due to their small size. Any of the lamprey species could, in theory, spawn in the sections of the Dawn and Whelanbridge Rivers within the study area. However, if they do, then any loss of habitat resulting from the road scheme would not constitute a very significant impact because similar substrate occurs widely both upstream and downstream of the areas in question on both rivers. The proposed River Suir bridge will not affect migrating fish.

AIR QUALITY

The air quality assessment followed the methodology outlined in the *Design Manual for Roads and Bridges*. The extent of emissions from traffic were calculated as a function of traffic flow, traffic composition and traffic speed. Predicted levels of carbon monoxide, oxides of nitrogen (as NO₂), non-methane hydrocarbons (as benzene and 1,3-butadiene) and particulate matter (as PM₁₀) were compared to the appropriate standards. Emission levels were modelled within 50 m, 100 m 150 m and 200 m distant bands from the centre of the road, using traffic speeds of 30 km/h, 50 km/h, 60 km/h and/or 100 km/h, as appropriate.

On the existing road network in the year 2000 (no bypass) nitrogen dioxide was found to exceed the appropriate standards within 50 m of the N25 West (Butlerstown), N25 East (Slieverue), N24 Grannagh Castle, Rice Bridge, N9 at Newrath and the Quays due to the volumes of traffic currently using these roads. However, as you move back from the road to within 100 m, only Rice Bridge and the Quays exceed the annual average NO₂ standard of 21 ppb. In 2025 the N25 West (Butlerstown), N25 East (Slieverue), Rice Bridge, N9 at Newrath and the Quays exceed the standard of 21 ppb within 50 m. Particulate Matter (PM₁₀) levels exceed the 50 ug/m³ threshold for all road sections considered up to a maximum distance of 200 m in 2000. By 2025 ('Do Nothing scenario') all PM₁₀ levels exceed the standard of 50ug/m³ within 50 m; however now only Rice Bridge exceeds the standard at 100 m, and none of the sections examined exceed the standard at greater than 100 m in 2025.

The bypass proper was divided into four sections for the analysis of air quality: Kilmeaden, proposed New River Crossing, Northern bypass and Rice Bridge. For the scenario in which the Bypass is constructed, annual average levels of NO₂ exceed the appropriate standard for both Rice Bridge and the New Crossing in 2025 within 50 m of the road, but not at greater distances. For PM₁₀, levels exceed the 50 ug/m³ standard only within 50 m of the Rice Bridge. Additional road sections associated with the proposed bypass include the N9, N24, the Western Link, Newrath Link and The Quays leading to Rice Bridge. Annual average NO₂ figures exceed the appropriate standard for both The Quays and the Western Link in 2025 with the bypass in place within 50 m of the road, but not at greater distances. In no instances do PM₁₀ levels exceed the appropriate standard.

In summary, the proposed bypass results in a reduction in the number of road sections along which air quality standards are predicted to be exceeded. As a consequence the proposed bypass will result in air quality that is better than would be on the existing road network under the 'Do Nothing' scenario.

The free flow of the traffic is normally essential in order to minimise the generation of traffic related pollutants. The incorporation of a toll plaza will mean that cars will have to slow down and then wait momentarily to complete the payment of the toll and take off again. Therefore, a detailed assessment of the air quality impacts associated with the operation of the toll plaza was carried out using the CAL3QHCR dispersion model in conjunction with the most recent European Emissions database from the CORINAIR working group. With the Toll Plaza in place, peak hour and maximum 8-hour CO concentrations; annual mean benzene concentration; peak hour, annual average and 98th %ile of hourly NO₂ concentrations and annual average and 24-hr PM₁₀ concentrations are predicted to be below the significance criteria at the nearest residential receptor, using the refined analysis.

There is the potential for a number of emissions to atmosphere during the construction phase of the development. In particular, the construction activities may generate quantities of dust. Construction vehicles, generators etc., will also give rise to exhaust emissions. An environmental impact minimisation plan will be implemented, in order that the effect of construction on air quality will not be significant; this will include a dust minimisation plan, including e.g. regular cleaning of site roads, speed restrictions for vehicles using on-site roads, washing of all vehicles leaving the site etc.

NOISE

The potential impact of traffic noise was assessed for all properties within 300 m of the preferred route option, following the methodology of the *Design Manual for Roads and Bridges*. There were 58 typical assessment locations identified, each representing a number of properties. Many of the locations are rural sites, not affected by existing traffic noise or other identifiable noise sources.

The potential noise impact of the bypass was compared to the ongoing noise impact of traffic on local roads at identified properties, and on properties close to the existing route which passes through the centre of Waterford. All calculations of predicted traffic noise from the proposed bypass were compared to predictions of noise levels from the 'Do Minimum' scenario. Primarily, it can be seen that the construction of the bypass results in major benefits (in terms of noise impact) for properties along the existing through Waterford route, with some benefit to properties at Dunkitt. The majority of properties currently impacted by traffic on adjacent roads, would experience similar increases in traffic noise under all scenarios. The most significant impacts are where traffic noise is introduced to areas not currently exposed to predominant traffic noise impact, particularly along the Kilmeaden section and northern section of the bypass (east of Grannagh Junction). The DMRB considers excessive impact with regard to the UK limit for traffic noise of 68 L_{A10,18h}. There are thirteen properties which, with the proposed bypass, would be subject to predicted noise levels which exceed this limit. The following mitigation measures considered are appropriate:

- provision of an acoustic noise barrier to the nearside edge of the road
- use of a pervious or proprietary noise-reducing road surface

There is no standard method of predicting traffic noise impact associated with a toll plaza. However, measurements and comparative calculations suggest that while the braking and acceleration of traffic close to a junction may cause additional noise, this is offset by the overall reduction of mean traffic speed. Overall this would result in a significant reduction in noise impact. It is also noted that the proposed location of the Toll Plaza is at least 240 m from the nearest residential properties resulting in substantial attenuation of traffic noise from the toll plaza..

It is anticipated that the construction noise levels will, for properties closest to the proposed route, exceed the existing ambient noise level during phases of construction. The extent of this impact will vary since “on time” of activities is limited. However, presently in Ireland, there are no fixed noise limits for construction noise. The relevant British Standard is BS5228 (1997), *Noise and Vibration Control on Construction and Open Sites*. While this document is not in force in Ireland, it contains a number of guidelines and recommendations which are considered appropriate and of good working practice for all construction contracts. These guidelines will form the basis of control and limiting of potential impact to noise sensitive locations. The inclusion of mitigation measures based on these guidelines will ensure that whilst the impact may exceed existing ambient levels along the proposed route, maximum daily activity noise levels can be controlled by the good working practise of the contractor.

LANDSCAPE

Six distinct landscape character areas were identified: Undulating agricultural landscape, River Suir valley, Estates and Demesnes, Urban fringe/Industrial areas, Southern Suir valley tributaries, Blackwater tributary valley. Based on this classification, the landscape quality of the study area was assessed using a five point scale as follows:

- The *Highest Quality Landscapes* are of an ‘awe inspiring’ or ‘sublime’ nature and include Mount Congreve, the ‘Suir Loop’, and the River Suir as viewed to the south west from Granny Castle.
- The *Very Attractive Landscapes* are of high value nationally and include the shoreline areas along the River Suir, the woodland areas at Dooneen and Powersknock, the Blackwater valley and the demesnes at Whitfield Court, Carriganore and Gracedieu.
- The *Good Landscapes* are areas which, although still attractive, have less significant landscape features and contain more intrusive elements. This category covers the majority of the remnant areas of the undulating lowland agricultural land.
- The *Ordinary Landscapes* are the built up areas within the Kilmeaden area, including the Waterford Creamery facilities, storage yards and linear residential developments along the roads.
- No *Poor Landscapes* were identified within the study area.

The effect of the route on particular elements of the landscape character are summarised in the Table 3.

TABLE 3 Summary of landscape impacts.

	Kilmeaden Section	Western Section	Suir Crossing Section	Northern Section
Undulating agricultural River Suir valley.	Moderate	Slight	Moderate	Moderate
Estates and Demesnes	Slight	Moderate	Moderate	N/A
Urban fringe/ Industrial areas.	Moderate	Slight	Slight	N/A
Southern Suir valley tributaries.	No Change	N/A	Slight / Moderate	Slight
Blackwater tributary valley.	Slight	N/A	N/A	N/A
	N/A	N/A	Moderate	N/A

Elements of the proposed road likely to cause visual impacts include the traffic and associated structures such as signs and lights. Embankments, bridges and viaducts are likely to cause the greatest visual intrusion. Cuttings viewed from certain angles will cause visual deterioration, but from other angles they will help conceal the road. Substantial visual impacts are likely to arise where properties are directly overlooking the proposed road. In particular substantial impacts were identified at Dooneen, Bawnfune, Killoteran on the south of the River Suir. On the northern shore properties overlooking the River Suir, and the proposed route on the opposite bank, are buffered by the distance involved and by the existing rail way line. A few properties at Granny will be in close proximity to the junction and experience substantial impact. A few properties on the fringes of Killaspy and Kilmurry will also experience substantial impacts. The total numbers of properties which would be subject to visual impacts are shown in the Table 4.

TABLE 4 Summary of visual impacts.

	Kilmeaden Section	Western Section	Suir Crossing Section			Northern Section
			Bypass	N9/N24	Newrath	
Substantial Impact	13	1	13	2		19
Moderate Impact	10	24	8	8	21	15
Slight Impact	25	17	20	11	7	23
No Change	24	10	3	5	4	49

A comprehensive landscape planting scheme is proposed to mitigate the landscape and visual impacts. The aim of the mitigation is to integrate the proposed road into the existing landscape character. In order to achieve this, landscape planting will reflect the existing vegetative cover. A variety of plant mixes will be planted along the route corridor to provide screening and allow integration of the route. Plant mixes will include wetland scrub, woodland scrub, broad leaved woodland and wild meadow grassland. At specific locations there will be wetland habitat creation. The sizes and species of plants will be varied to provide the creation of instant effects at key locations along the route corridor.

The use of extensive scrub planting with pockets of broad-leaved woodland and extensive hedgerow planting will screen the road from the majority of viewpoints. The use of local species planted at densities similar to existing areas of woodland will blend the new planting with the existing. Where the land is agricultural new hedgerows and stands of trees will break up the mass of the road and screen key areas. As the mitigation matures, the residual landscape and visual impacts will be greatly reduced.

MATERIAL ASSETS

Many of the relevant issues relating to Material Assets have been addressed under other headings above (Human Environment, Agriculture, Hydrogeology and Water Quality and Fisheries). Therefore, for the purposes of this report, the Material Assets section only considers impacts on major utilities, navigational rights on the River Suir, the existing transportation infrastructure and the use of natural resources.

The proposed scheme will result in the construction of new roads/road realignments. In some places sections of the existing road network will be utilised for the scheme. The scheme will have positive impacts on the road network by reducing traffic levels on the existing network, thereby reducing vehicle wear and tear on this network; and providing a new road network constructed to high design standards. Temporary disruption will occur during construction to sections of the existing road network in the vicinity of the proposed route.

The proposed scheme will require three crossings of operating railway lines. These crossings will be constructed in accordance with the requirements of CIE so as to avoid/minimise disruption to railway services. The proposed scheme will result in the removal of around 1.4 km of the old Waterford-Dungarvan railway line in Woodstown and Knockhouse Upper townlands. However, provision has been made to maintain the continuity of the old railway line. Therefore plans to develop this line as a walking route and/or tourist railway should not be affected.

The proposed bridge crossing of the Suir will have a navigation clearance of around 14 m. This will not affect navigation by commercial fishermen or amenity users of the river. The navigation clearance will prevent the existing commercial shipping usage by Morris Oil Company Ltd., and could affect possible future usage by EMO Oil. The existing commercial user will be compensated for the loss of navigation.

The proposed scheme will require crossings of major utilities (electricity, gas, telecommunications and water supply) at various locations. These crossings will be constructed in accordance with the requirements of the relevant bodies (the Electricity Supply Board, Waterford County Council, Bord Gais, Eircom and Cablelink) to avoid/minimise disruption to their services.

The construction of the proposed route will require extensive earthworks for embankments and cutting. There will be a surplus of material generated by the scheme and this surplus will have to be disposed of off-site. Details of the sourcing of material for embankment construction and road surfacing, and of the disposal of material excavated from cuttings are up to the discretion of the successful contractor, provided they conform to any relevant statutory requirements.

CULTURAL HERITAGE

The archaeology of the study area is characterised by a significant range of site-types. The surviving upstanding monuments show concentrations of site types dating from the Bronze Age and the Medieval period, respectively. The earliest surviving site types date from the Bronze Age. A number of fulachta fiadha (ancient cooking sites) are scattered throughout the study area and some fine examples of standing stones, one of the most easily recognisable Bronze Age monuments, also occur. There are many ringforts of the Early Christian Period still surviving in the area. Other sites of this period include a number of multi-period ecclesiastical centres. As this area lies close to the important medieval centre of Waterford, it is likely that earthen defensive

features such as moated sites are present in the landscape. Later medieval strongholds such as castles and tower houses are present in the area. Both Kilmeaden Castle and Granny Castle were originally seats of the le Poer family.

From the post medieval period there are many fine country houses, vernacular cottages, industrial buildings and other structures, many of which are in good condition and show continuity of use. These are listed in the statutory development plans. In addition to these listed features, the walled garden at Mount Congreve includes a large Georgian (18th century) glasshouse/greenhouse; a glasshouse/greenhouse of this date and size is extremely rare in Ireland. Another unlisted site of architectural importance are the gates and gate lodge at Whitfield Court.

The proposed route will directly affect five sites of Cultural Heritage importance: Standing stones at Airmount Cross, an Enclosure at Knockanagh, a Mineral railway at Mullinabro, Grannyquarries, and Granny Castle. The standing stones at Airmount Cross lie in the landtake area of the road. If the stones are to be disturbed or interfered with in any way, then an archaeological investigation of the stones and the surrounding area will take place. If it is not possible to exclude their location from the landtake of the road, then consultation with Dúchas will first take place. If Dúchas approve the removal of the stones, then a full archaeological excavation of the stones and the surrounding area will be carried out. The stones will then be moved, under license from Dúchas, to an agreed location, probably within the same field.

The proposed route will not directly impact upon Granny Castle but will affect the zone of archaeological potential around the site. The Enclosure at Knockanagh is a de-listed SMR site which is, however, still considered to be of archaeological potential. Grannyquarries and the Mineral railway at Mullinabro are sites of industrial archaeological importance. All these sites will be subject to archaeological investigation and recording before any interference takes place.

Intertidal and subtidal archaeological surveys of the location of the proposed River Suir crossing did not find any archaeological features or objects. The impact of the final bridge design will be archaeologically assessed and excavations on or close to the foreshore will be archaeologically monitored.

Undetected archaeological sites, which are currently masked by vegetation, may exist along the route. The removal of all topsoil on the route will form an early stage of the development and will be archaeologically monitored. In the event of an archaeological find the developer shall facilitate the archaeologist in every possible way in investigating the find.

All archaeological mitigation will be carried out under license from Dúchas.

CLIMATE

The likely impact of the proposed route on the microclimate of Mount Congreve was assessed due to the potential sensitivity of the internationally important gardens to changes in microclimate.

The Mount Congreve gardens slope gently to the north and this combined with the extensive canopy of mature trees provides a relatively frost-free environment for the gardens. Ridges of higher ground to the east, south and west also provide shelter from winds. With a general

preponderance of south-westerly winds, a degree of funnelling and deflection along the Ballymoat Stream valley from somewhat west of south can be expected at Mount Congreve. The area of Magnolias to the north-west of Mount Congreve House appears to be well sheltered from the prevailing winds, and little storm damage seems to have occurred here over many years.

The proposed route will affect the microclimate within the Mount Congreve estate. However, none of the microclimate features affected are of importance in providing a suitable microclimate for the Mount Congreve gardens. Therefore, the proposed route is not likely to significantly affect the Mount Congreve gardens.

UNTOLLED SCENARIO

Introduction

As described above, it is intended to procure the provision of the scheme on a Public Private Partnership (PPP) basis as a toll road. The statutory process governing the provision of tolling on a national road involves a separate procedure from the motorway and environmental assessment process. To take account of the fact that the tolling proposal involves a separate decision, this section of the EIS sets out the manner in which the likely effects on the environment of the proposed road development incorporating tolling, as reported in the main sections of this EIS, would differ if the tolling proposal did not proceed. Many of the effects arising from the proposed road are independent of the tolling proposal and the effects under the headings Agriculture, Ecology, Geological Heritage, Hydrogeology, Cultural Heritage and Climate are anticipated to be similar to those of the scheme including tolling.

Project Description

In the absence of tolling, the predicted design traffic flows along the scheme year would differ from those predicted to occur with tolling. Some additional traffic would be attracted onto the new route resulting in the predicted design year traffic flows shown in Table 5.

TABLE 5 Design year traffic flows (AADT) with and without toll scheme.

Road Section	With toll	Without toll
N25 bypass Western Tie-in-Western Link	19,354	19,973
N25 bypass Western Link-Granny Interchange	40,721	49,084
N25 bypass Granny Interchange-Northern Tie-in	23,015	25,867
Western Link	34,733	42,224
Newrath Link	18,390	18,371
N9 Link	18,189	18,351
N24 Link	19,021	19,024

Human Environment

In general, the effects under this heading are anticipated to be similar to those for the scheme incorporating tolling. The untolled scenario would affect the projected traffic flows causing a slight decrease, compared to the tolled scenario, in the traffic travelling through Waterford City, of between 1,000 and 3,000 AADT for the routes which have been modelled. Therefore, with reference to the positive impacts associated with reduced traffic flows through Waterford City identified for the scheme incorporating tolling, the untolled scenario would tend to have

qualitatively similar positive impacts, but the magnitude of these impacts would be slightly increased.

Water Quality and Fisheries

In general, the effects under this heading are anticipated to be similar to those for the scheme incorporating tolling. The untolled scenario would result in significant increases in traffic flows on the Western Link and the section of the N25 bypass from the Western Link Junction to the Granny Interchange. These increases would result in a significantly increased risk of serious spillages for the two sections of road draining to outlets on the Knockhouse Upper Stream.

Air Quality

There is little real difference in air quality between the tolled and untolled scenarios. Redistribution of traffic does not result in significant shifts in air quality on specific stretches of road between the two scenarios. For example, while the PM₁₀ level for the Rice Bridge within 50 m is 50.46 ug/m³ (above the standard of 50 ug/m³) with the tolled scenario, it is predicted to be 49.95 ug/m³ without, due to difference in predicted traffic flows. While there are slight variations, such as the previous example, the overall impact of the untolled scenario on air quality, compared to the do-nothing scenario, is not considered to be significantly different from the tolled scenario.

Noise

Calculations indicate that the majority of properties would experience a slight increase in noise level due to the untolled scenario compared to the tolled scenario. In the majority of cases, these changes do not significantly affect the noise impact of the scheme, compared to the do minimum. However, there is some significance where the predicted noise level at properties is increased to greater than the target limit of 68 dB L_{A10,18h} due to the untolled scenario. This occurs for five properties. The noise impact of the untolled scenario is similar to that of the tolled scenario along the existing through Waterford route.

Landscape

The effects under this heading are generally anticipated to be similar to those for the scheme incorporating tolling, with the following exception. The tolled scenario would result in secondary impacts from traffic and from lighting in the vicinity of the toll plaza, resulting in a moderate adverse impact to the Gracedieu estate. With the untolled scenario, the toll plaza lighting will not be operational, and there would not be any aggregation of traffic in this area. Therefore, under the untolled scenario, the moderate adverse impact to the Gracedieu estate, from secondary effects of traffic and lighting, would not occur.

Material Assets

The effects under this heading are generally anticipated to be similar to those for the scheme incorporating tolling. The untolled scenario would result in slight reductions in traffic volumes continuing to use the existing road network, compared to the tolled scenario. Therefore, there would be a small increase in the magnitude of positive impact of the scheme in terms of reducing vehicle wear and tear on the existing road network.