

**Regional Bedrock Map**

The Gunpoint formation is defined by the incoming of metre scale sandstone bodies and the first thick (more than 1 m) intraformational breccias. Lithologically the Gun Point Formation consists of purple and green medium to coarse-grained and cross-stratified sandstones with interbedded sequences of thin purple siltstones and fine-grained parallel and cross-laminated sandstones (GSI 1997).

The Castlehaven Formation conformably overlies the Gun Point Formation in the project area. The formation outcrops only on the south limb of the Macroom Syncline where it is less than 160 m in thickness (Williams et al 1989). The formation is characterised by the purple mudstones and siltstones with interbedded fine grained sandstones.

#### **5.4. Hydrogeology**

According to the GSI aquifer classification system, the aquifer underlying the Nutricia site and within the surrounding area is classified as locally important (L1) (which is generally moderately productive in local zones) and a Poor aquifer (P1) (which is generally unproductive except in local zones).

The houses in the surrounding area in the immediate surrounds are all on private wells. The Nutricia site is supplied by water via the River Lee by agreement with the ESB. This agreement permits Nutricia to abstract up to 1 million gallons per day.

There are no direct discharges from the existing Nutricia site to groundwater. All runoff from hardstanding areas is collected through a network of channels and conveyed, via an outfall to the River Lee. This system is described in greater detail in Section 2 of this EIS.

#### **5.5. Potential Impacts on Geology and Hydrogeology**

A detailed description of the proposed development is provided in Section 2. The aspects of the proposed development that could impact on geology and hydrogeology are:

- Increase in groundwater vulnerability through overburden stripping for the construction of the new buildings/extensions
- The storage of hydrocarbons on the site, the leakage of which to the subsurface could impact on soil and groundwater quality. At present there are 2 x 250,000 gallon oil tanks and a 50,000 gallon diesel tank within a bunded area. Refuelling is done on a contained concrete pad.
- Contamination of the underlying aquifer by unbunded milk and raw materials storage silos
- The development of the site will require products from quarries (aggregate, concrete products and ready mix). This will have an indirect impact on those quarries or natural resources.

## 5.6. Mitigation Measures

The measures proposed include avoidance, reduction and mitigation and include:

1. There will be no direct discharges to groundwater or soils. Clean run-off and treated effluent from the on-site wastewater treatment plant will be discharged to the River Lee in accordance with the discharge licence for the site.
2. All working areas will be hardstanding. Any spillages/leakages will be directed to the wastewater treatment plant thereby avoiding direct discharge to the subsoil/environment.
3. The storage of all fuels will be in tanks of good integrity and bunded in accordance with industry practice. Refuelling of plant will be carried out on concrete pads. Should the pipes leak, the leakage will be contained. Monitoring of oil usage will alert site management to potential leaks. This practice will be implemented for both the construction and operational phases.
4. All new silos will be bunded.

With the containment of run-off and the bunding of hydrocarbon storage tanks and the new milk silos, the risk to groundwater and soil is negligible.

## 5.7. Conclusions on Geology and Hydrogeology

As there will be no direct discharge to soils or groundwater from the Nutricia facility, and the run-off from hardstanding areas will be managed through a surface water management system, there will be no significant impact from the proposed extension.

For inspection purposes only.  
Consent of copyright owner required for any other use.

---

## 6. HYDROLOGY AND WATER QUALITY

---

### 6.1. Introduction

This section addresses hydrology and surface water runoff in the existing environment, identifies potential impacts of the proposed development and outlines measures to avoid, reduce and mitigate potential impacts. Residual impacts that cannot be avoided are also identified and discussed.

### 6.2. Methodology

This section was prepared using available published literature, water quality data and a desk-based study of hydrology and water quality. The literature reviewed included:

1. Southwestern River Basin Management Project
2. Environmental Monitoring Data from Nutricia
3. Environmental Monitoring Data from the Environmental Protection Agency (EPA)

A walk over survey of the site was carried out in October 2006. Hydrological features were noted in the surrounding area.

Following the compilation of data and information on the existing environment, the details of the proposed development were reviewed with the project engineers to identify potential impacts on hydrology. Where potential impacts were identified, changes were made to the design in consultation with the project engineers to avoid, reduce and mitigate these potential impacts.

### 6.3. Applicable Regulations for Discharges to Surface Water

Wastewater treatment and effluent capacity is governed by a range of national legislation and relevant design guides which are below:

#### *Memorandum No 1 Water Quality Guidelines*

Memorandum No 1 Water Quality Guidelines, 1978, specifies the water quality objectives for fresh water as follows:

- BOD of receiving waters should not be raised by more than 1mg/l arising from any particular discharge
- BOD of effluent to be discharged should be less than 20mg/l
- Suspended solids of effluent to be discharged should be less than 30mg/l

### *Surface Water Directive (S.I. No. 294 of 1989)*

Water is abstracted from the River Lee at positions downstream of the outfall location. The closest public drinking water abstraction point is Inniscarra dam, approximately 19.7 km downstream of the outfall location. As such it is assumed to be unaffected by the effluent discharged from the plant. Therefore, the Surface Water Regulations are not deemed to be of relevance to the receiving waters.

### *Bathing Water Regulations (S.I. No. 155 of 1992)*

As there are no designated bathing areas along the River Lee, the provisions of these Regulations do not apply to the receiving waters. FTC are unaware of any traditional bathing areas along the river in the vicinity of the Nutricia Site.

### *Freshwater Fish Directive / Salmonid Water Regulations*

The Freshwater Fish Directive 78/659/EEC was given effect in Irish law by EC (Quality of Salmonid Waters) Regulations 1988 (S.I.No. 293 of 1988). The Salmonid Waters Regulations designated certain fresh waters as Salmonid Waters for the purposes of these Regulations.

The River Lee is designated as Salmonid Waters. Specifically, it is the "main channel from source to Cork City Waterworks at Lee Road" that is designated as Salmonid Waters.

Table 6.1 summarises the limits set out in the Salmonid Regulations with regard to the quality of the receiving waters (ie the limits permissible in the river to which the treated effluent is discharged):

**Table 6.1: Salmonid Regulations Permissible Values (in the River)**

Parameter	Value	Unit
BOD <sub>5</sub>	5	mg/l O <sub>2</sub>
Suspended Solids	25	mg/l
Nitrites	0.05	mg/l NO <sub>2</sub>
Non ionised Ammonia	0.02	mg/l NH <sub>3</sub>
Total Ammonium	1	mg/l NH <sub>4</sub>

### *Phosphorus Regulations (S.I. No. 258 of 1998)*

The Local Government (Water Pollution) Act, 1977 (Water Quality Standards for Phosphorus) Regulations, 1998 gave further effect to provisions of Council Directive 76/464/EEC on pollution caused by certain dangerous substances discharged into the aquatic environment. The Phosphorus Regulations require that the water quality standards for any part of a river be maintained or improved by 2007.

The Phosphorus Regulations adopt a Biological Quality Rating Index (referred to as a Q Index) for the purpose of rating water quality in a river. The Q Index ranges from Q5, which is pristine unpolluted water, to Q1, which indicates gross pollution.

The sampling stations directly upstream of the existing Nutricia outfall location (refer to Figure 6.2) on the River Lee have been assigned a Q value of Q4 by the EPA in 2005. The closest sampling station downstream of the outfall location is Inniscarra Bridge. This station has been assigned a Q value of Q3 by the Environmental Protection Agency (EPA) in 2005. This relates to polluted water quality. Inniscarra Bridge is approximately 19.7 km downstream of the outfall location. Numerous tributaries join the River Lee between the outfall location and Inniscarra Bridge, e.g. Cumber River, Sullane River. These would all affect the water quality of the downstream sampling point producing an inaccurate portrayal of the water quality directly downstream of the outfall location. For this reason, and to ensure a conservative analysis, Q-values upstream (nearest) to the outfall location were used in the assimilative capacity analysis.

The results of the EPA assessment are summarised in Table 6.2 (Source: EPA River Water Quality Report, 2005).

**Table 6.2: Biological Quality Rating**

Station Name	Station Number	Location*	1990	1994	1997	1999	2002	2005
Dromcarra Br	0300	u/s	5	4-5	4-5	4	4	4
Toon Br	0800	u/s tributary	3-4	3-4	3-4	3-4	4	4
Athsollis Br	0800	d/s tributary	3-4	4	4	4	3-4	3-4
Inniscarra Br	0600	d/s	3-4	3	3	3	3	3

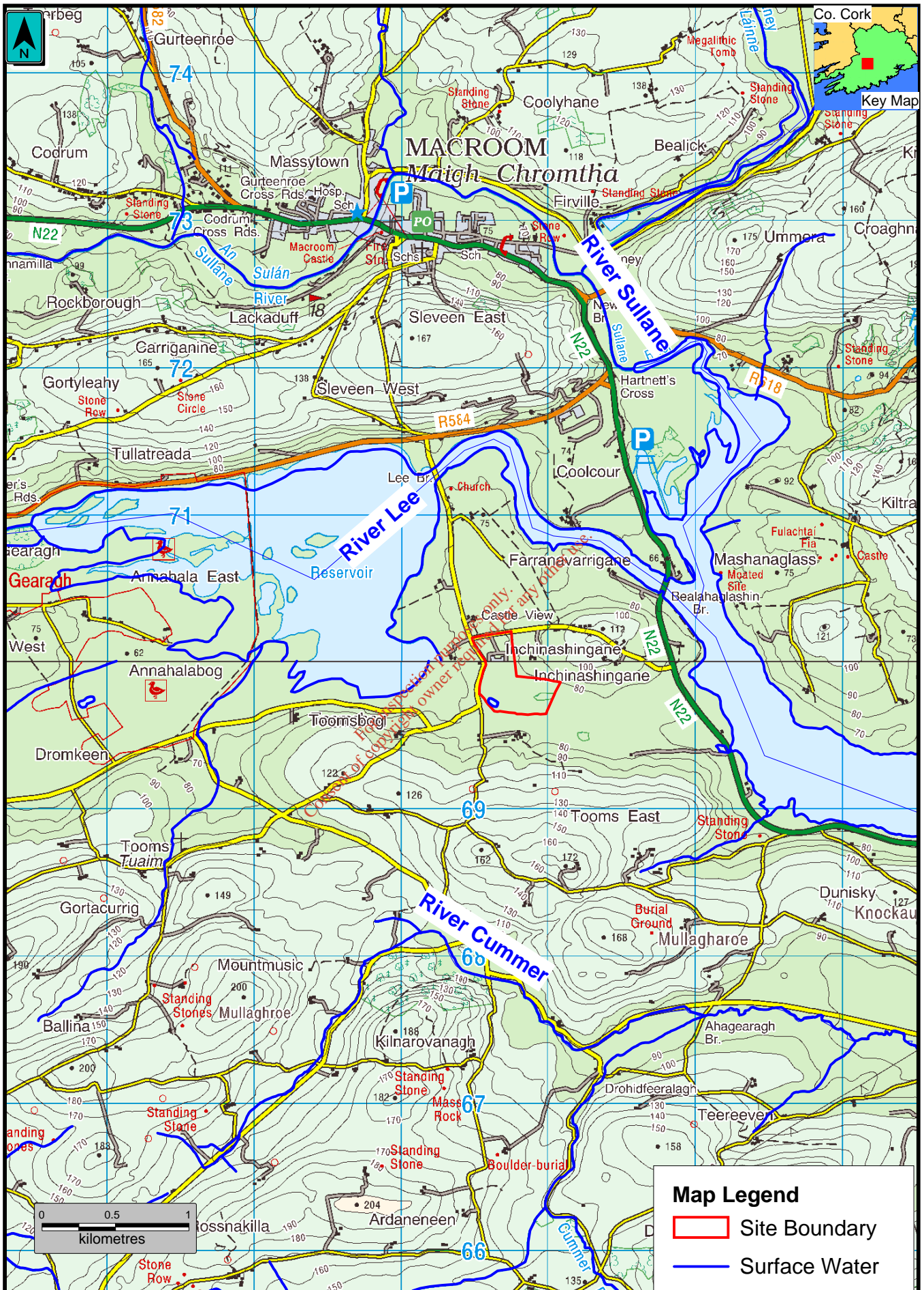
\* Location relates to upstream (u/s) or downstream (d/s) from the outfall discharge location

The Phosphorus Regulations specify target values for water quality, based on the Q value assigned as a result of monitoring carried out by the EPA during the period 1995 – 1997, and published in the EPA River Water Quality Report, 1998. The relevant Q value for this study is that from the nearest sampling point downstream of the outfall – this will determine the maximum permissible concentration in the receiving waters. As the nearest sampling point downstream is Inniscarra Bridge, 19.7 km from the outfall, the Q value from the upstream sampling point of Dromcarra Bridge is used in the calculations, for the reasons given above.

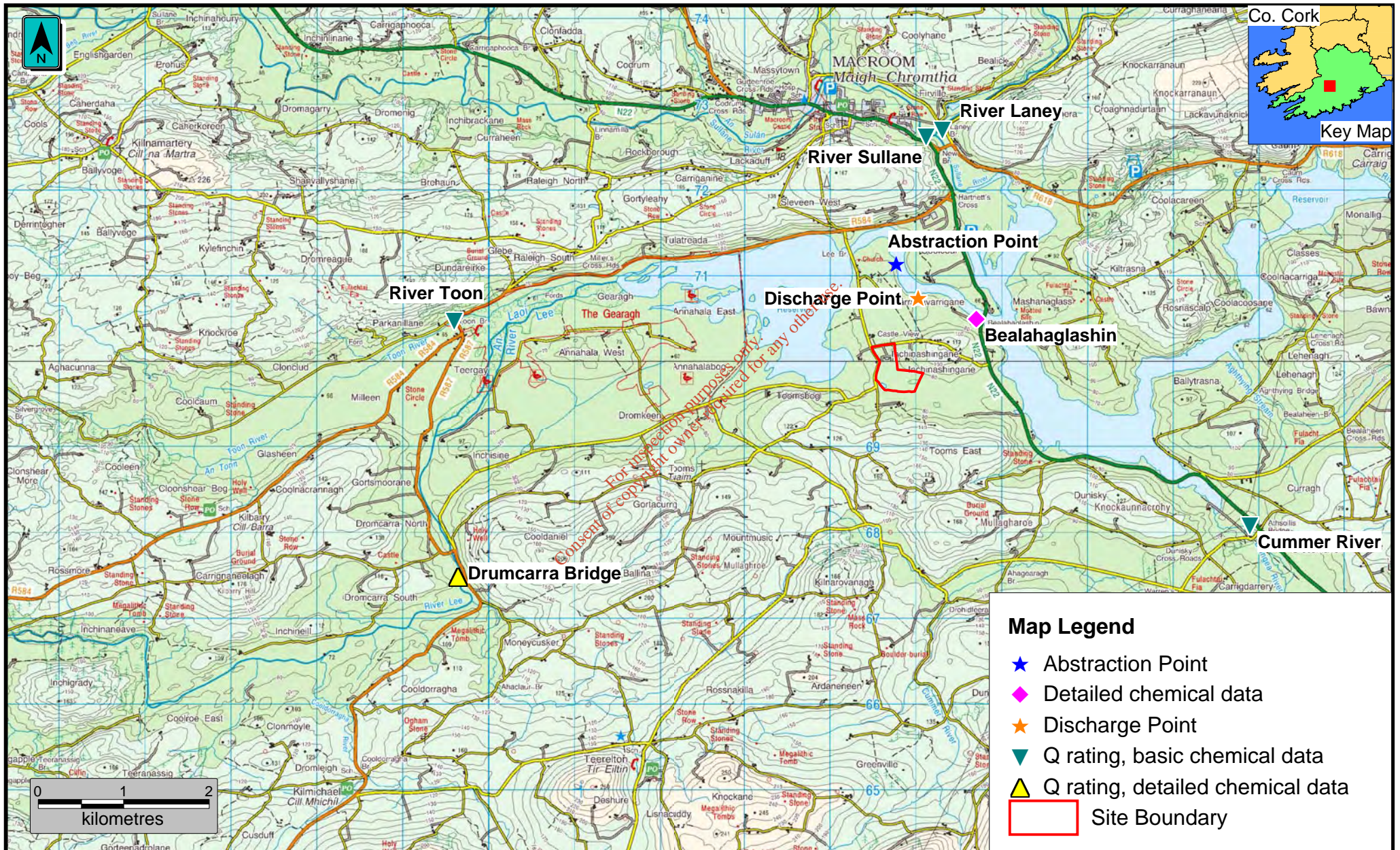
The relevant target quality standard to be achieved by a river with a Q value of Q4-5 in 1997 is either of the following:

- Maintain a Q value of Q4-5, or
- Median Phosphate Concentration of 20µg/l (0.02 mg/l) for molybdate – reactive phosphate (MRP) not to be exceeded.

It is appropriate that the median phosphate concentration associated with the target Q rating be taken as the limit for the receiving waters. The River Lee in the vicinity of the Nutricia outfall, has a target Q rating of 4-5, which has a corresponding target median phosphate concentration of 20µg/l for MRP. Hence, 20µg/l is the maximum permissible concentration of phosphate in the River Lee, at this location.



Surface Water Features near the Site





## 6.4. Existing Hydrology and Drainage

The Nutricia facility is located within the Lee Valley corridor and within a 1 km radius is bounded on three sides by lakes, reservoirs and the River Lee of the Upper Lee Valley as indicated on Figure 6.1. There are no surface water features within the site boundary or directly adjacent to the site boundary. The closest surface water body to the existing site is the Lee Reservoir which is some 250 m to the west.

The existing Nutricia site is permitted to abstract approximately 1 million gallons of water from the Lee reservoir. The location of this abstraction point is shown on Figure 6.2. This abstraction is under licence from the ESB.

Surface-water run-off from the site is collected in a series of drainage ditches and directed to a holding tank prior to discharge to the River Lee. In addition, there is an overflow lagoon on-site.

As described in detail in Section 2 of this EIS wastewater originates at a number of locations on the site and is conveyed to the on-site wastewater treatment plant. The existing effluent plant is designed to treat approximately 1,300 m<sup>3</sup> of effluent per day. The operation of this facility is described in greater detail in Section 2 of this EIS.

The existing plant has an effluent discharge licence from Cork County Council and this licence was revised in 2006. A copy of this discharge licence is included in Appendix 6 and is summarised in Table 6.3.

**Table 6.3: Discharge Limits on current discharge licence**

Parameter	Discharge Limit
pH	6.0 – 8.5
Biological Oxygen Demand (BOD) (mg/l)	10
Total Suspended Solids (mg/l)	25
Oils, Fats, Greases (mg/l)	5
Detergents (mg/l)	5
Total Phosphorus as Phosphorus (mg/l)	1.5
Ortho Phosphate as Phosphorus (mg/l)	1.0
Total Nitrogen (mg/l)	15
Ammonia as Nitrogen (mg/l)	0.5
Mineral Oils (mg/l)	1

Clean surface water arising from roof and yard areas at the Nutricia facility are collected and piped with treated wastewater (from the on-site wastewater treatment plant) to the Carrigadrohid reservoir on the River Lee at Farranavarrigane. The location of this discharge point is illustrated on Figure 6.2.

#### 6.4.1. Existing Water Flows

No hydrological data is available for the River Lee in the vicinity of the outfall. Two gauging stations were operated by ESB at Lee Bridge (0.96 km u/s) and Bealahaglashin Bridge (0.75 km d/s) in the past but have since become obsolete. The 95 percentile flow (F95) and the mean flow for the river in the vicinity of the outfall was therefore estimated using other hydrological data available on the River Lee and surrounding rivers.

The catchment area of the discharge outfall location was calculated as 252 km<sup>2</sup>.

##### *95 Percentile Flow*

Two methods were used to estimate the 95 percentile flow at the discharge outfall location.

Method One involved calculating the specific 95 percentile flow of other gauging stations on the River Lee using their catchment areas. An average value was taken from these calculations to determine the 95 percentile flow in the river at the discharge outfall location. Using this method the 95 percentile flow was estimated at 0.83 m<sup>3</sup>/s.

Method Two involved using the EPA hydrological data available for a number of tributaries of the River Lee in the vicinity of the outfall. It is estimated that the sum of these flows will give an approximate value for the 95 percentile flow in the outfall location. Using this method the 95 percentile flow was estimated at 0.93 m<sup>3</sup>/s.

Full Calculations are shown in Appendix 7.

The 95 percentile flow calculated using method one was used in the assessment of the assimilative capacity of the River, unless otherwise stated, as it is the more conservative figure and will result in more stringent allowable limits for each parameter analysed.

##### *Mean flow*

The specific mean flow was calculated for two gauging stations to estimate the annual mean flow at the discharge outfall location. The OPW provides mean flow data on one gauging station on the River Lee (Ballymullen). The mean flow data from a gauging station on the Bandon River in Cork was also used in the calculations due to the lack of information on the River Lee. This station was considered appropriate given that the annual average rainfall at that station is approximately equal to the annual average rainfall at the discharge location.

Using this method, the mean annual flow was estimated as 7.92 m<sup>3</sup>/s

Full Calculations are shown in Appendix 7.

#### 6.4.2. Existing Water Quality

The existing water quality of the River Lee and surrounding waters is described in relation to:

- EPA Monitoring Data
- Monitoring results from monitoring conducted by Nutricia
- Southwestern River Basin Management Project

#### EPA Data

The Environmental Protection Agency (EPA) undertakes monthly monitoring of the River Lee at Dromcarra Bridge and Bealahaglashin Bridge. These locations are shown on Figure 6.2. Table 6.4 indicates the average values of parameters recorded in 2004 and 2005 at these locations. (Full data is available in Appendix 7).

Dromcarra Bridge is situated on the River Lee, upstream of the proposed outfall location at a distance of approximately 6.3 km. Bealahaglashin Bridge is located 0.75 km downstream of the outfall on the River Lee.

**Table 6.4: EPA Sampling Data**

Parameter	Unit	Measured		Permissible
		Station No. 0300	Station No. 0800	Outfall
		Dromcarra Br	Bealahaglashin Br	
<b>BOD (average)</b>	mg/l O <sub>2</sub>	1.2	1.4	2.2
<b>Suspended Solids (average)</b>	mg/l	1.6	1.7	25
<b>MRP -Phosphate (average)</b>	mg/l P	0.008	0.009	0.02
<b>Nitrate (average)</b>	mg/l	4.05	5.42	50
<b>Nitrite (average)</b>	mg/l	0.018	0.037	0.05
<b>Ammonium (average)</b>	mg/l	0.036	0.058	1

Source: EPA

The permissible concentrations for the various parameters are derived as follows:

- **Phosphorus** - the Phosphorus Regulations (*S.I. No. 258 of 1998*) specify the maximum permissible concentration of phosphate in the river as discussed in Section 6.2. The maximum permissible concentration of orthophosphate is 0.02 mg/l of phosphate.
- **BOD** - the most limiting specification for the allowable BOD level in the river is the Memorandum No 1 Water Quality Guidelines. These guidelines specify that the BOD of receiving waters should not be raised by more than 1mg/l. The permissible BOD level in the River Lee is therefore 2.2 mg/l (i.e. u/s value 1.2 mg/l plus 1 mg/l).

- **Total Suspended Solids** – the Surface Water Regulations (S.I. No. 294 of 1989) specify the maximum permissible concentration of total suspended solids (TSS) as 50 mg/l in the receiving waters while the EC (Quality of Salmonid Waters) Regulations 1988 (S.I. No. 293 of 1988) specify the maximum permissible concentration of TSS as <25 mg/l in the receiving waters. For the purpose of this report a value of <25 mg/l will be used.
- **Ammonia** - under EC (Quality of Salmonid Waters) Regulations 1988 (S.I. No. 293 of 1988) the guidance value for total ammonium and non-ionised ammonia are given as <1 mg/l NH<sub>4</sub> and 0.02 mg/l NH<sub>3</sub>. The permissible total ammonium level is therefore 1mg/l.
- **Nitrate** – the maximum permissible concentration of nitrate as stated in the Surface Water Regulations (S.I. No. 294 of 1989) is 50 mg/l NO<sub>3</sub>. However, these limits are not mandatory, since the relevant legislation does not cover the receiving waters. These values will however be used as a guideline limit, for the purposes of this assessment.
- **Nitrite** – the Salmonid Waters Regulations (S.I. No. 293 of 1988) specify a maximum permissible nitrite value of 0.05 mg/l NO<sub>2</sub>.

#### *Southwestern River Basin Management Project*

The Southwestern River Basin Management Project is a project that “*seeks to maintain and improve the quality*” of the surface and groundwaters of the South Western River Basin District, in accordance with the terms of the EU Water Framework Directive (WFD). The main objective of the WFD is to obtain good status in all waters by 2015. The South Western River Basin District comprises substantially the counties of Cork and Kerry, all of Cork City, and also parts of counties Limerick, South Tipperary and Waterford as can be seen in Figure 6.3.

Four no. pressures, created by human activities, were identified which can cause deterioration of water quality if not managed properly. These are:

- Sewage and other effluents discharged to waters from point sources, e.g. outfall from treatment plant
- Discharges arising from diffuse or dispersed activities on land
- Abstractions from waters
- Structural alterations to water bodies

Risk assessment procedures were developed to analyse the impact of these pressures on water bodies in the district. Four no. risk categories were created to assess how sensitive the water bodies are from the pressures above.

- **Not At Risk:** Sufficient information is available to determine that the impact of the pressures on the water body is such that the water body is likely to achieve good status. In some cases monitoring data is available to confirm the good quality status of the water body. Measures must be considered here to ensure deterioration from good status does not occur.
- **Probably Not At Risk:** Sufficient information is not available at present to determine whether the water body is at risk of failing to meet good status. However, based on existing available data, it is probable that the water body will be found to be not at risk when further information becomes available.

- Probably At Risk: Sufficient information is not available at present to determine whether the water body is at risk of failing to meet good status. However, based on existing available data it is probable that the water body will be found to be at risk when further information becomes available.
- At Risk: Sufficient information is available to determine that the impact of pressures on the water body is such that the water body is unlikely to achieve good quality status unless measures are taken to reduce the impact, thereby improving the water quality.

The results of this assessment, as shown in Figure 6.3 and Figure 6.4, indicates that the River Lee, downstream of the outfall as far as the estuary is either “at risk” or “probably at risk”. Carrigadrohid Reservoir, the location of the outfall, is considered “at risk” from the pressures above. Lake water bodies designated as “at risk” were as a result of abstraction and structural alteration.

It is important to note that the designation “at risk” is not necessarily an indication of the present quality of the water. The water quality may be good but the magnitude of the pressures which exist within the catchment, if not properly managed, poses a risk that the water body may not achieve good status in accordance with the WFD, or that the water quality is in danger of deterioration.

*For inspection purposes only.  
Consent of copyright owner required for any other use.*

Figure 6.3: Southwestern River Basin District, river risk assessment results

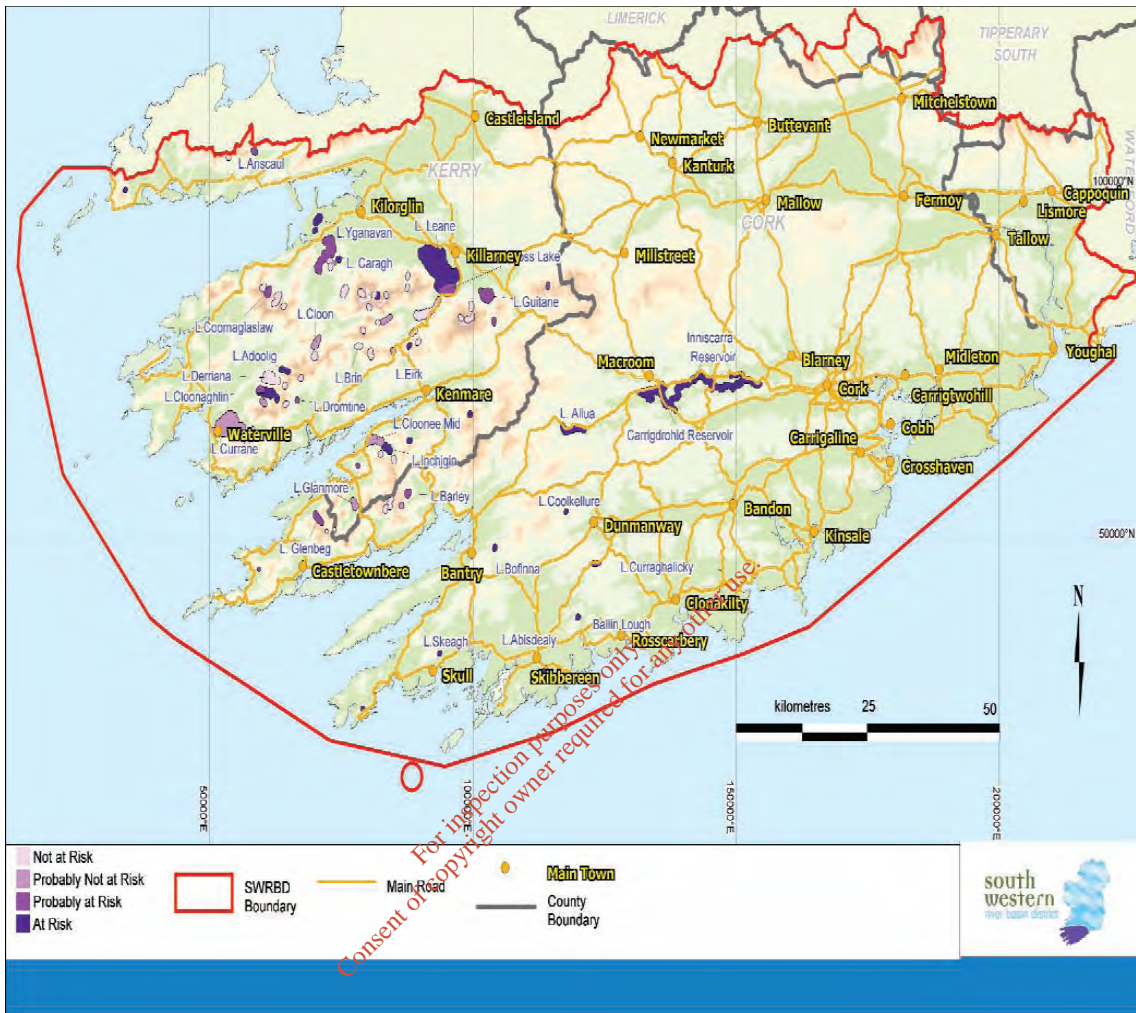
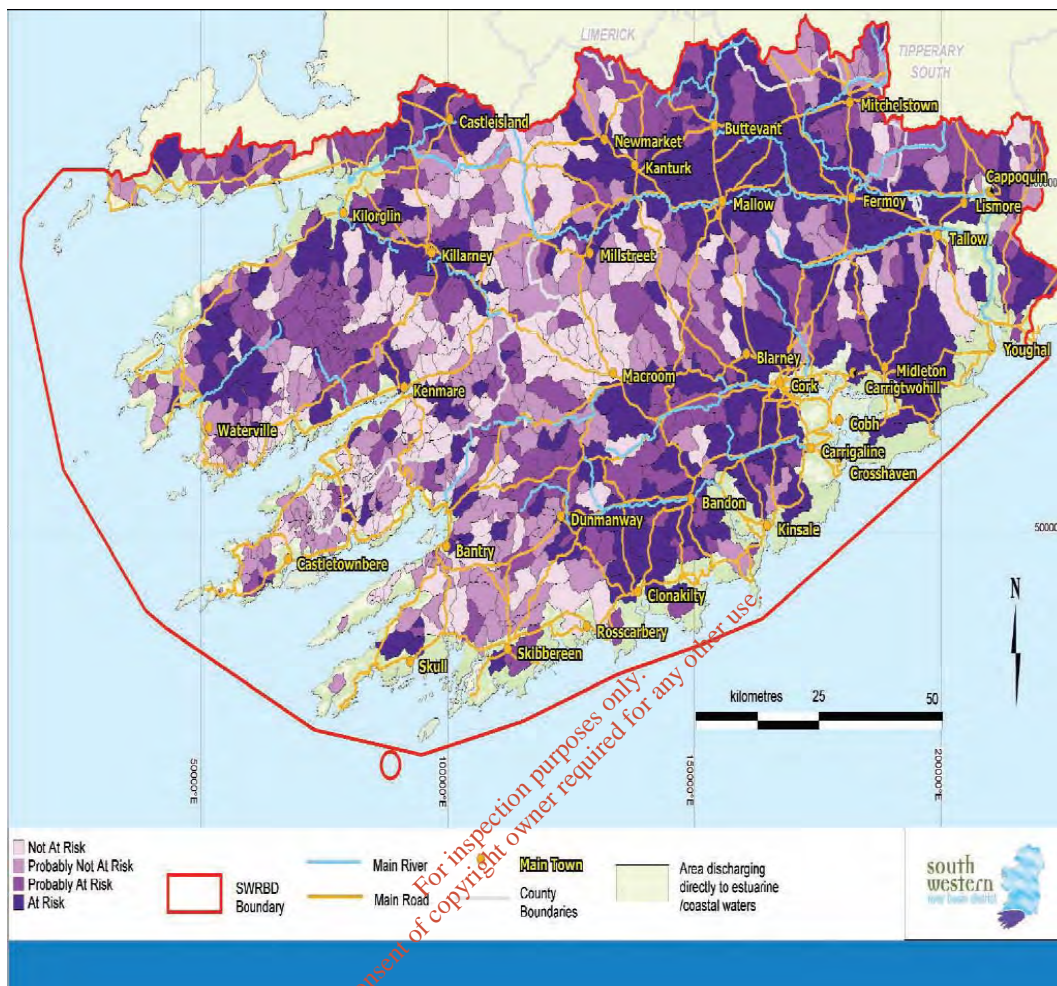


Figure 6.4: Southwestern River Basin District, lake risk assessment results



## 6.5. Assimilative Capacity of the River Lee

The assimilative capacity of a river determines the maximum discharge that can be tolerated by the river without deteriorating the quality of the river water.

The background levels for the River Lee (Dromcarra Bridge) are as follows:

- *MRP* 0.008mg/l
- *BOD<sub>5</sub>* 1.2 mg/l
- *Suspended Solids* 1.6 mg/l
- *Total Ammonium* 0.036 mg/l N

To estimate the assimilative capacity of a freshwater river, to determine if the receiving waters can absorb the wastewater discharge, the following formula is used:

$$\text{Assimilative capacity [kg/day]} = (C_{\text{max}} - C_{\text{back}}) \times F \times 86.4$$

Where:

$C_{\text{max}}$  = maximum permissible concentration [mg/l] based on existing downstream concentrations

$C_{\text{back}}$  = background (upstream) concentration [mg/l]

F = the flow in the receiving waters [m<sup>3</sup>/s]

86.4 = conversion factor.

The 95 percentile flow ( $F_{95} = 0.83 \text{ m}^3/\text{s}$ ) is used in the calculations below, unless otherwise specified. This represents a low flow, ensuring a high level of compliance for the resulting prescribed assimilative capacity.

### 6.5.1. Phosphorus

- $C_{\text{max}}$  is fixed at 0.020 mg/l (=20µg/l) by the Phosphorus Regulations.
- $C_{\text{back}}$  is the median phosphate concentration upstream of the proposed outfall, measured at Dromcarra bridge (0.008 mg/l) located 6.3 km upstream of the proposed outfall location.
- F = Median flow (7.92 m<sup>3</sup>/s)

The allowable concentration of ortho-phosphates is based on the measurement of background concentrations over a ten month period. For this reason, the use of the F-95, ie the 95-%ile flow, is very conservative in terms of ortho-phosphate assimilative capacity.

The median flow is therefore used for the assessment of ortho-phosphate assimilative capacity.



The allowable discharge rate for the plant, as specified by the current discharge licence is 1,500 m<sup>3</sup>/day. Using this figure the allowable concentration of MBR-phosphates in the discharging effluent can be calculated. This figure is the maximum concentration of phosphates in the discharged effluent that can be tolerated by the river without deteriorating the quality of the river water.

As stated, it is considered more appropriate that the mean flow is used since the phosphate concentration refers to a median value. Therefore, if the annual mean flow (7.92 m<sup>3</sup>/s) is used in the assimilative capacity calculation the results are as follows:

*Phosphorus Assimilative Capacity using mean flow = 8.90 kg/day*

*Allowable concentration of MBR-phosphates using mean flow = 5.93 mg/l*

It is clear that the current discharge limit of 1 mg/l is acceptable under these circumstances. Therefore, if the limits of the discharge licence with respect to Phosphates are met, the effluent should have a minimal detrimental effect on the River Lee.

The construction of the proposed extension will increase the discharge volume to 2,400 m<sup>3</sup>. Using this figure as the discharge rate, the assimilative capacity of the river was re-examined. The allowable concentration of MBR-phosphates using the proposed discharge volume and the mean flow was calculated as 3.71 mg/l. This again is above the current discharge limit of 1 mg/l indicating that the increase in discharge volume will not cause a significant detrimental effect on the river water quality.

All calculations can be seen in Appendix 7.

### 6.5.2. BOD<sub>5</sub>

The BOD assimilative capacity is calculated below on the basis that the maximum increase in the river BOD concentration is limited to 1 mg/l as described in Section 6.2 above, and the 95 percentile flow is used ( $F_{95} = 0.83$  m<sup>3</sup>/s). It is considered appropriate to use  $F_{95}$  data for this parameter, to ensure a high level of compliance.

*BOD Assimilative Capacity = 1 x 0.83 x 86.4 = 71.59 kg/day*

Using the allowable discharge rate of 1,500 m<sup>3</sup>/day, the allowable concentration of BOD in the effluent is calculated as 47.73 mg/l. This figure is the maximum concentration of BOD in the discharged effluent that can be tolerated by the river without deteriorating the quality of the river water.

The current discharge licence specifies an effluent limit of 10 mg/l for BOD. Therefore, if the limits of the discharge licence with respect to BOD are met, the effluent should have a minimal detrimental effect on the River Lee.

Using the proposed increased discharge volume of 2,400 m<sup>3</sup> the allowable concentration of BOD was recalculated as 29.83 mg/l. This is above the current discharge limit of 10 mg/l indicating that the increase in discharge volume will not cause a significant detrimental effect on the river water quality.

Full calculations can be seen in Appendix 7.

### 6.5.3. Suspended Solids

- $C_{max}$  is fixed at 25 mg/l by the Salmonid Regulations
- $C_{back}$  is the median suspended solids concentration measured at Dromcarra bridge (1.6 mg/l)
- $F = 95$  percentile flow (0.83 m<sup>3</sup>/s)

$$\text{Suspended Solids Assimilative Capacity} = (25 - 1.6) \times 0.83 \times 86.4 = 1675.32 \text{ kg/day}$$

Using the allowable discharge rate of 1,500 m<sup>3</sup>/day, the allowable concentration of Suspended Solids in the effluent was calculated as 1116.83 mg/l. This figure is the maximum concentration of Suspended Solids in the discharged effluent that can be tolerated by the river without deteriorating the quality of the river water.

The current discharge licence specifies an effluent limit of 25 mg/l for Suspended Solids. Therefore, if the limits of the discharge licence with respect to Suspended Solids are met, the effluent should have a minimal detrimental effect on the River Lee.

Using the proposed increased discharge volume of 2,400 m<sup>3</sup> the allowable concentration of Suspended Solids was recalculated as 698.05 mg/l. This is above the current discharge limit of 25 mg/l indicating that the increase in discharge volume will not cause a significant detrimental effect on the river water quality.

Full calculations can be seen in Appendix 7

### 6.5.4. Ammonium

- $C_{max}$  is fixed at 1 mg/l by the Salmonid Regulations.
- $C_{back}$  is the median total ammonium concentration measured at Dromcarra bridge (0.036 mg/l)
- $F = 95$  percentile flow (0.83 m<sup>3</sup>/s)

$$\text{Ammonium Assimilative Capacity} = (1 - 0.036) \times 0.83 \times 86.4 = 69.02 \text{ kg/day}$$

Using the allowable discharge rate of 1,500 m<sup>3</sup>/day, the allowable concentration of Total Ammonium in the effluent was calculated as 46.01 mg/l. This figure is the maximum concentration of Total Ammonium in the discharged effluent that can be tolerated by the river without deteriorating the quality of the river water.

Using the proposed increased discharge volume of 2,400 m<sup>3</sup> the allowable concentration of Total Ammonium was recalculated as 28.76 mg/l.

The current discharge licence specifies an effluent limit of 0.5mg/l of Ammonia as Nitrogen. It also specifies a discharge limit of 15 mg/l Total Nitrogen as Nitrogen. It would appear from the assimilative capacity assessments for Ammonium, Nitrates and Nitrites (see below) that this could be relaxed somewhat, without any deterioration in the water quality of the receiving waters.

Full calculations can be seen in Appendix 7.

#### 6.5.5. Nitrates

- $C_{\max}$  is fixed at 50 mg/l by the Surface Water Regulations.
- $C_{\text{back}}$  is the median nitrate concentration measured at Dromcarra bridge (4.05 mg/l)
- $F$  = 95 percentile flow (0.83 m<sup>3</sup>/s)

$$\text{Nitrates Assimilative Capacity} = (50 - 4.05) \times 0.83 \times 86.4 = 3289.78 \text{ kg/day}$$

Using the allowable discharge rate of 1,500 m<sup>3</sup>/day, the allowable concentration of Nitrates in the effluent was calculated as 2,193.19 mg/l. This figure is the maximum concentration of Nitrates in the discharged effluent that can be tolerated by the river without deteriorating the quality of the river water.

Using the proposed increased discharge volume of 2,400 m<sup>3</sup> the allowable concentration of Nitrates was recalculated as 1,370.74 mg/l.

The current discharge licence does not specify an effluent limit for nitrates.

Full calculations can be seen in Appendix 7.

#### 6.5.6. Nitrites

- $C_{\max}$  is fixed at 0.05 mg/l by the Salmonid Regulations.
- $C_{\text{back}}$  is the median nitrite concentration measured at Dromcarra bridge (0.018 mg/l)
- $F$  = 95 percentile flow (0.83 m<sup>3</sup>/s)

$$\text{Nitrites Assimilative Capacity} = (0.05 - 0.018) \times 0.83 \times 86.4 = 2.29 \text{ kg/day}$$

Using the allowable discharge rate of 1,500 m<sup>3</sup>/day, the allowable concentration of Nitrites in the effluent was calculated as 1.53 mg/l. This figure is the maximum concentration of Nitrites in the discharged effluent that can be tolerated by the river without deteriorating the quality of the river water.

Using the proposed increased discharge volume of 2,400 m<sup>3</sup> the allowable concentration of Nitrites was recalculated as 0.95 mg/l.

The current discharge licence does not specify an effluent limit for nitrites.

Full calculations can be seen in Appendix 7.

### Conclusion on Assimilative Capacity

The assimilative capacity of the River Lee at the outfall discharge location is sufficient for the current discharge limits. The River Lee can also tolerate the proposed increase in discharge volume without significant deterioration in the water quality.

#### 6.5.7. Potential Impact on Surface Water

A detailed description of the proposed development is provided in Section 2. The activities and processes to be conducted or likely to occur, at the site that could potentially impact upon surface water are as follows:

1. Increased surface water runoff from roof and hardstanding areas. The total hardstanding area will be approximately 4.24 ha, which consists of clean water contribution areas (roofs and others) and road and other trafficable hardstanding areas.
2. Storage of hydrocarbons as discussed in Sections 2 and 5
3. Storage of Raw Materials and Milk as discussed in Sections 2 and 5
4. The operation of an on-site wastewater treatment plant, which discharges treated effluent to the River Lee.

**Table 6.5: Increase in Runoff caused by Proposed Development**

	Impervious Area	Run-off Coefficient	5 yr Return Period Run-off from WinDes Simulation
	Ha		l/s
Existing Plant	3.466	1.0	311
Future Plant including proposed extension	4.24	1.0	393
<b>Percentage Increase</b>	<b>22%</b>		<b>26%</b>

The existing layout of the Dairygold Facility has been assessed and the surface water run-off estimated from the existing plant. The extension of the facility was also examined and the increase in surface water run-off calculated. The increase in surface water run-off due to the extension will be from the extended hard surface area and from the vertical faces of the new buildings. The resulting increase in flow is estimated as 26%.

#### 6.5.8. Mitigation Measures

As stated, the estimated increase in surface water run-off, as a result of the proposed development, is 26% over and above the existing run-off volumes. A number of measures are proposed to mitigate against this increase in surface water run-off. These measures include avoidance, reduction and mitigation as follows:

- The generation of foul water will be kept to a minimum. All clean surface water will be collected and conveyed separately to the outfall at the wastewater treatment plant.

- Hydrocarbons will be stored in bunded areas as discussed in Sections 2 and 5. All new silos will also be bunded.
- The runoff from the site during the operation period will be discharged via pumps directly to the River Lee. Attenuation of flows can also be provided by the lagoon to ensure compliance with the discharge rate of the discharge licence. The storage volume of the attenuation pond is 7,600 m<sup>3</sup>. The total storage volume required to accommodate a 24 hour peak rainfall, with a return period of 24 hours, has been estimated as 3,730 m<sup>3</sup>. This is considered more than adequate.
- The surface water drainage system essentially consists of 3-networks. The first network collects clean water (from roofs and other clean water contributing areas) and conveys it directly to the discharge point. The second network will collect surface water from all trafficable areas and again discharges this to the outfall. In the event of any contamination however, this flow can be diverted to the lagoon, or the wastewater treatment plant for appropriate treatment. The third network collects process water and wastewater (municipal) and conveys it to the wastewater treatment plant.
- As indicated in Section 2, the existing wastewater treatment plant is currently being upgraded to include tertiary treatment, to ensure compliance with the existing discharge licence parameters
- Surface water quality will be monitored in accordance with any conditions of the IPPC licence required for the site's activities.

## 6.6. Conclusions on Hydrology and Water Quality

The existing surface water run-off from the hardstanding areas is collected and conveyed to a chamber prior to discharge via an outfall to the River Lee. An assessment of the increase in surface water run-off as a result of the extension to the facility has indicated that there will be sufficient capacity in the attenuation pond to retain the additional flows should this be required.

As part of the proposed extension to the facility, the existing wastewater treatment plant is being upgraded to include tertiary treatment. This will enable the existing facility to meet the requirements of its new discharge licence. In addition, further upgrades are being included in the plant extension, to ensure that the effluent from the extended plant will be treated to the required standard.

An assimilative capacity of the receiving waters was carried out based on available surface water quality data of the receiving waters in the vicinity of the outfall. This was compared with the allowable limits of the discharge licence and it is concluded that the discharge from the upgraded wastewater plant will not have a significant impact on the quality of the receiving waters.

---

## 7. ARCHITECTURAL, ARCHAEOLOGICAL AND CULTURAL HERITAGE

---

### 7.1. Introduction

This section assesses the impacts, if any, of the proposed extension to the development on the archaeological, historical and cultural environment in the vicinity of the site. This section will also propose mitigation measures to safeguard any monuments, features or finds of antiquity if required.

The objectives of this section are to:

- Identify all known features of archaeological and cultural heritage importance in the vicinity of the proposed development
- Determine any potential impacts of the proposed development on archaeology and cultural heritage
- Identify measures to mitigate any potential impacts of the development on archaeology and cultural heritage.

### 7.2. Cultural Heritage in the Existing Environment

A desk based assessment of archaeological features within 1 km of the facility was undertaken. The following information sources were consulted:

- Department of the Environment, Heritage and Local Government, Heritage Service records
- The Cork County Development Plan
  - Record of Protected Structures (RPS)

#### 7.2.1. Sites and Monuments Record

The Department of the Environment, Heritage and Local Government, Heritage Service records identify:

- all known upstanding monuments
- the original site location of monuments (i.e. destroyed monuments)

An area of interest is noted around each archaeological site. The area of interest is a zone of archaeological potential around the known remains in which archaeological features could potentially occur.

Protected structures within 1 km of the proposed site are listed in Table 7.1.

Sites and monuments within 1 km of the site boundary are listed in Table 7.2 and shown on Figure 7.1.

**Table 7.1: Protected Structures within 1 km of the site boundary**

Monument Number	Townland	Classification
00435	Farranvarrigane	Macloneigh Church (in ruins)
00436	Farranvarrigane	Macloneigh House

**Table 7.2: Sites and monuments within 1km of the site boundary (Heritage Council record)**

Monument Number	Entity ID	Easting	Northing	Class
CO071-147	CO10292	136008	69770	Standing stone
CO071-085	CO10208	134494	69125	Ringfort - rath
CO071-086	CO10209	134695	69303	Souterrain
CO071-087	CO10210	135010	69222	Souterrain
CO071-089	CO10212	135507	69220	Ringfort - rath
CO083-002	CO11415	134444	68902	Burial ground
CO083-003	CO10211	135059	69101	Ringfort - rath
CO071-083	CO10206	134172	70217	Fulacht fia
CO071-084	CO10207	134253	69520	Fulacht fia

### 7.3. Potential Impacts of the proposed Development on Cultural heritage

Possible impacts on features of cultural heritage could be physical or visual.

There are 9 no. sites and monuments within 1 km of the site boundary. The nearest site or monument to the proposed extension is some 150 m from the site boundary (refer to Figure 7.1). The proposed development will have no physical impact on such features outside the site boundaries. However, previously unidentified buried archaeology, should they exist, could be affected during construction of the facility.

The proposed development is not expected to further degrade the existing views from features of cultural heritage in the area. Visual impact of the proposed development is addressed in greater detail in Chapter 9.

### 7.4. Mitigation Measures

Avoidance of known archaeology/cultural heritage is the favoured option where possible. There are no known archaeological features within the site boundary. As the proposed extension will largely be constructed within areas of the site which have already been disturbed, no mitigation measures are proposed.

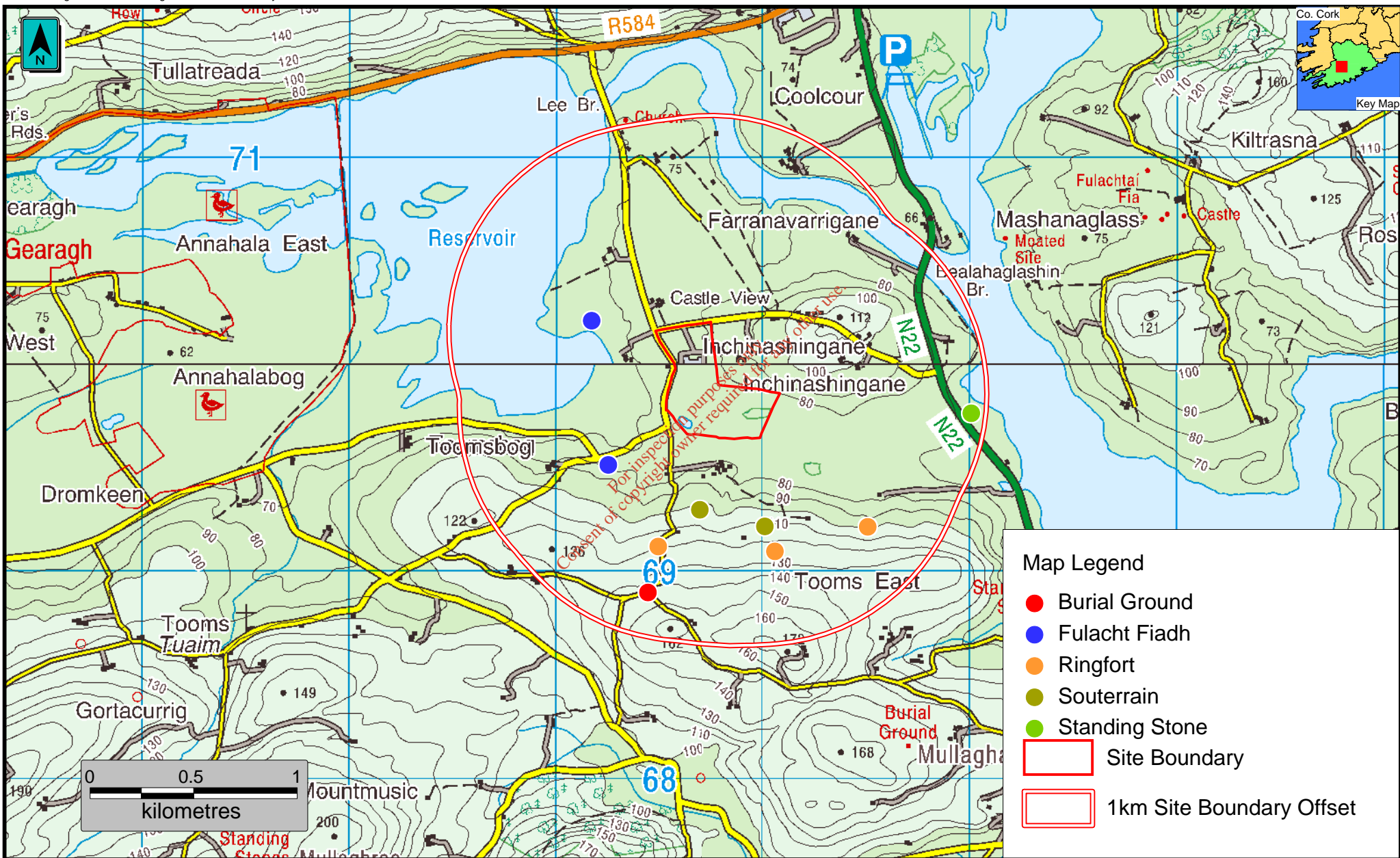
No mitigation measures are required for features of cultural heritage located outside of the site boundary.

## 7.5. Conclusions

Given the absence of identifiable archaeological monuments on the site there are no direct mitigation measures that need to be put into place.

*For inspection purposes only.  
Consent of copyright owner required for any other use.*





---

## 8. ECOLOGY

---

### 8.1. Introduction to Ecology

The ecological impact assessment for the proposed extension at the Nutricia facility was carried out by Fehily Timoney & Co. (FTC). Bat survey work was carried out on the night of the 19<sup>th</sup> October with subsequent surveys of birds, mammal, habitat and botanical features completed on the 31<sup>st</sup> October and 1<sup>st</sup> November 2006. In all cases, standard ecological survey techniques were used (Institute of Environmental Assessment 1995, Bibby et al. 2000, The Heritage Council 2005, Sutherland 2006).

The purpose of the study was:

- to undertake a desktop study of available ecological data for the site and area, including a review of designated sites within 10 km of the site
- to undertake ecological field surveys of the site and surrounding area in order to identify the flora and fauna present
- to evaluate the ecological significance of the site
- to assess the potential impact(s) of the proposed facility extension on the ecology of the site and surrounding areas
- to recommend mitigation measures to reduce any potential negative impact(s) of the proposed development on the ecology of the site and surrounding area

### 8.2. Methodology for Ecological Investigation

#### 8.2.1. Designated Sites

A desktop study was carried out to identify designated sites within 10 km of the proposed development site, such as Natural Heritage Areas (NHAs), Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). FTC holds an archive of GIS data that includes the location and extent of designated conservation areas. These are plotted on OS map backgrounds using MapInfo Professional 8.5 GIS application. Designated sites identified by this aspect of the study are outlined in Section 8.3.1.

#### 8.2.2. Habitats & Botanical Survey

Dominant habitats within the site boundary and adjacent area were classified according to Fossitt (2000). This involved a walkover of the site and adjacent area and recording the main habitats identified on a map of the site (1:2500 & 1:500 scale maps). The botanical survey was conducted in parallel with the habitats survey, with botanical species identified and recorded per habitat type. The main habitats and botanical species identified by this aspect of the study are outlined in Section 8.3.2.

### 8.2.3. Fauna Survey

#### *Mammal Survey*

The site of the proposed development was carefully walked during the ecological survey to assess signs of the presence of mammal species. Mammal signs, such as dwellings, feeding traces or droppings - usually indicate their presence although direct observations are also occasionally made. The methods used to identify the presence of mammals in the survey area followed international best practice (Lawrence & Brown, 1973; Clark, 1990; Smal, 1995; Sargent & Morris, 2003; Bang & Dahlstrom, 2004; JNCC, 2004).

Sightings or signs of all mammal species encountered during the survey were recorded on a map of the site (1:2500 & 1:500 scale maps). In addition, two Longworth small mammal traps were set up for one night and day and a digital trail camera (Cuddeback Expert 3MP model) was set up for eight nights and days.

The results of the mammal survey work are provided in Section 8.3.3.

#### *Bat Survey*

A specific bat survey was carried out given the amount of suitable habitat for foraging and roosting bats at and in the vicinity of the site. The purpose of the bat survey was to:

- a) Identify bat species feeding and/or roosting in the vicinity of the proposed development
- b) Quantify the relative abundances of the species encountered
- c) To make digital recordings for later confirmation of species identification
- d) Assess in particular the structures and vegetation on-site for evidence of roost emergence

The site was visited by two fieldworkers on the night of the 19<sup>th</sup> to 20<sup>th</sup> October, 2006. The weather was dry and mild with a light breeze – all comfortably within the acceptable range for conducting a bat survey as per the Bat Workers' Manual (JNCC, 2004). The day had seen some light rain but the inclement conditions dissipated by the evening.

Bats emit rapid ultrasonic pulses and process information in the echoes (or returned signals) to orientate themselves and to detect prey in their environment. Ultrasound is effective in prey detection as the wavelengths of lower frequencies are longer than the body length of most insects. Bats have distinct activity patterns – usually showing a peak at dusk and another just prior to dawn. The most commonly used methods of bat monitoring involve the use of a bat detector.

Bat detectors transform the ultrasound emitted by bats into audible sound. In this survey a BatBox Duet (Stag Electronics) was employed. This is a combination heterodyne and frequency division bat detector. This detector has a frequency range of 17-125 kHz. In addition, the sounds output when bat activity was detected were saved as a digital file on an Olympus Digital Recorder.

Many bats have distinctive echolocation calls (when heard on a heterodyne bat detector) that are recognisable to experienced bat workers even without sonogram analysis. When the bats are visible in the field other characteristics are also useful as identification aids: these include flight height, size, speed, habitat preference and general appearance on the wing (sometimes called 'jizz').

However, post-survey analysis of field recordings can be a very useful tool for identification of bats to species level. The process of making recordings and producing clear sonograms is complex and requires a basic understanding of sound theory. The subject is explained in detail in Tupinier (1997).

In recent year's specialist software for the analysis of echolocation calls have been developed. In the analysis of the field recordings made at the Nutricia site FTC used BatScan (v.8.7, Stag Electronics 2003) a specially developed PC application for the analysis of recordings made from the Duet bat detector.

Once an interesting bat call has been captured in a spectrogram image, a spectrum plot can be created at any point in time to show details of the frequency-division spectrum. A plot will be created showing the detailed power spectrum at that point in time. The peak frequency in the pulse of a bat call can also be a reliable indicator of the bat species, especially where bats of the same genus are differentiated most easily by their sonar calls. Also, where several bat species are flying together they can easily be spotted and separated on the spectrogram. The results of the bat survey work are provided in Section 8.3.3.

### *Bird Survey*

The site was visited on two occasions to assess the local avian community – 31<sup>st</sup> October & 1<sup>st</sup> November 2006. The weather during the survey days was excellent: dry with sunny spells and with excellent visibility. The conditions were all comfortably within the acceptable range for conducting an avian survey (Bibby *et al.*, 2000). Photographs and field notes were used to help record observations in the field and records of note were positioned using a handheld GPS unit (Garmin GPSMAP 60CSx) and large scale (1:5,000) field map.

Within the site boundary a standard avian transect technique analogous to the Countryside Bird Survey (CBS) methodology was used to assess the avifauna that use and that might potentially occur at the site:

1. An effort was made to closely approach every point within the site
2. All species encountered (seen or heard) were recorded and where possible their abundance was noted
3. In addition to casual observations, ten linear transects of c. 200-400 metres in length were walked in order to survey all of the habitats present within the site boundaries (see Figure 8.1)
4. Birds observed flying over, or near, the site were recorded
5. Binoculars (Kowa 8x40) were used to scan the area (in particular the sky, open grassland, patches of trees and dense shrub-layer, and nearby buildings) to seek additional avian records
6. Note was taken of the habitat composition of the local landscape to better assess the avian community in the wider locality.

In this manner, a taxa list of the birds present in the area, their relative abundance and behaviour, as well as their association with various habitats could be generated. In addition species not encountered, but likely to use the available range of habitats during the year, could reasonably be assessed.

The birds in the wider area, particularly those birds associated with the Gearagh were also surveyed. Standard scan sampling (Sutherland, 2006) was employed to evaluate the birds at the Gearagh across the day. A number of sampling locations were chosen to ensure coverage of the waters and shoreline of the waters in the vicinity of the site. Counts were made with the aid of binoculars and a Bushnell Spotting Scope (x20-x60). Initial evening observations were made on the 31<sup>st</sup> October 2006 with more detailed scans carried out the following day. To augment these, data information was collated from BirdwatchIreland from *I-WeBS* counts of the Gearagh and Sullane Delta. The results of the bird survey work are provided in Section 8.3.3.

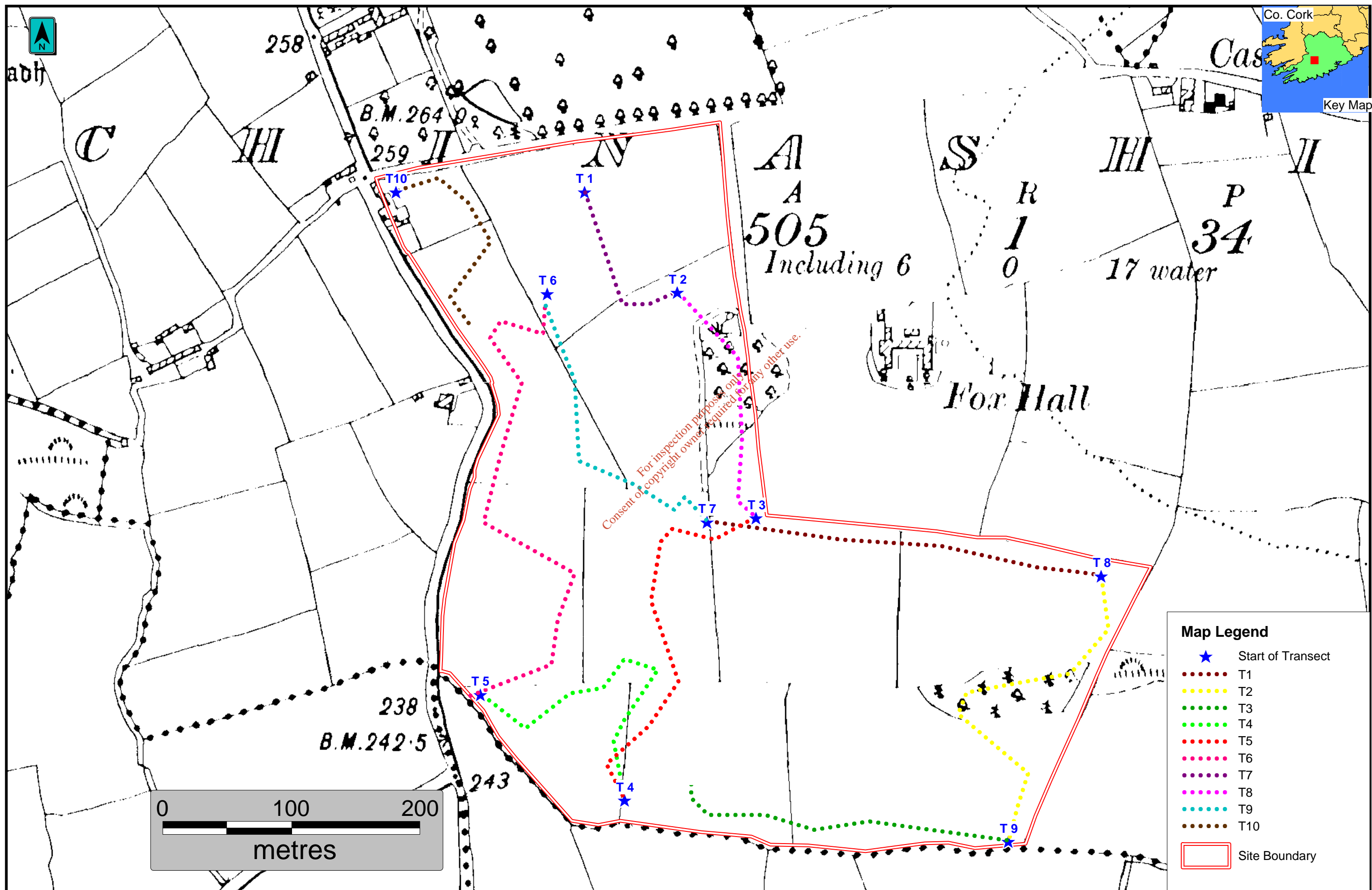
#### *Other Fauna*

The presence of any other species, e.g. macroinvertebrates or amphibians, encountered during the taxa-specific surveys was recorded. Special note was taken of the habitats in which these species were observed. These fauna are outlined in Section 8.3.3.

#### 8.2.4. Water Quality Investigation

Water quality data of the river systems surrounding the Nutricia facility were reviewed. These data were available from the Environmental Protection Agency (EPA) website (<http://www.epa.ie/rivermap/data/W7.html>).

River systems included in this review were the Rivers Lee, Toon, Laney, Sullane and Cummer. The River Laney is a tributary of the River Sullane, which in turn is a tributary of the River Lee. The Rivers Toon and Cummer are also tributaries of the River Lee. The current Nutricia facility abstracts water from the River Lee under agreement with the Electricity Supply Board (ESB), who owns the reservoir. Water is then discharged back into the same waterway, after treatment on site under a Cork County Council discharge licence (see Figure 6.2 for abstraction and discharge locations). The results of the water quality investigation are provided in Section 8.3.4.



### 8.3. Ecology in the Existing Environment

#### 8.3.1. Designated Sites within 10 km of the Site

The proposed extension area is not part of any designated site. However, there are 5 designated areas within 10 km of the proposed development site (Table 8.1. and Figure 8.2). Where available, the NPWS site synopses for the designated areas are included in Appendix 8.

**Table 8.1: Summary of designated sites within 10 km of the proposed development.**

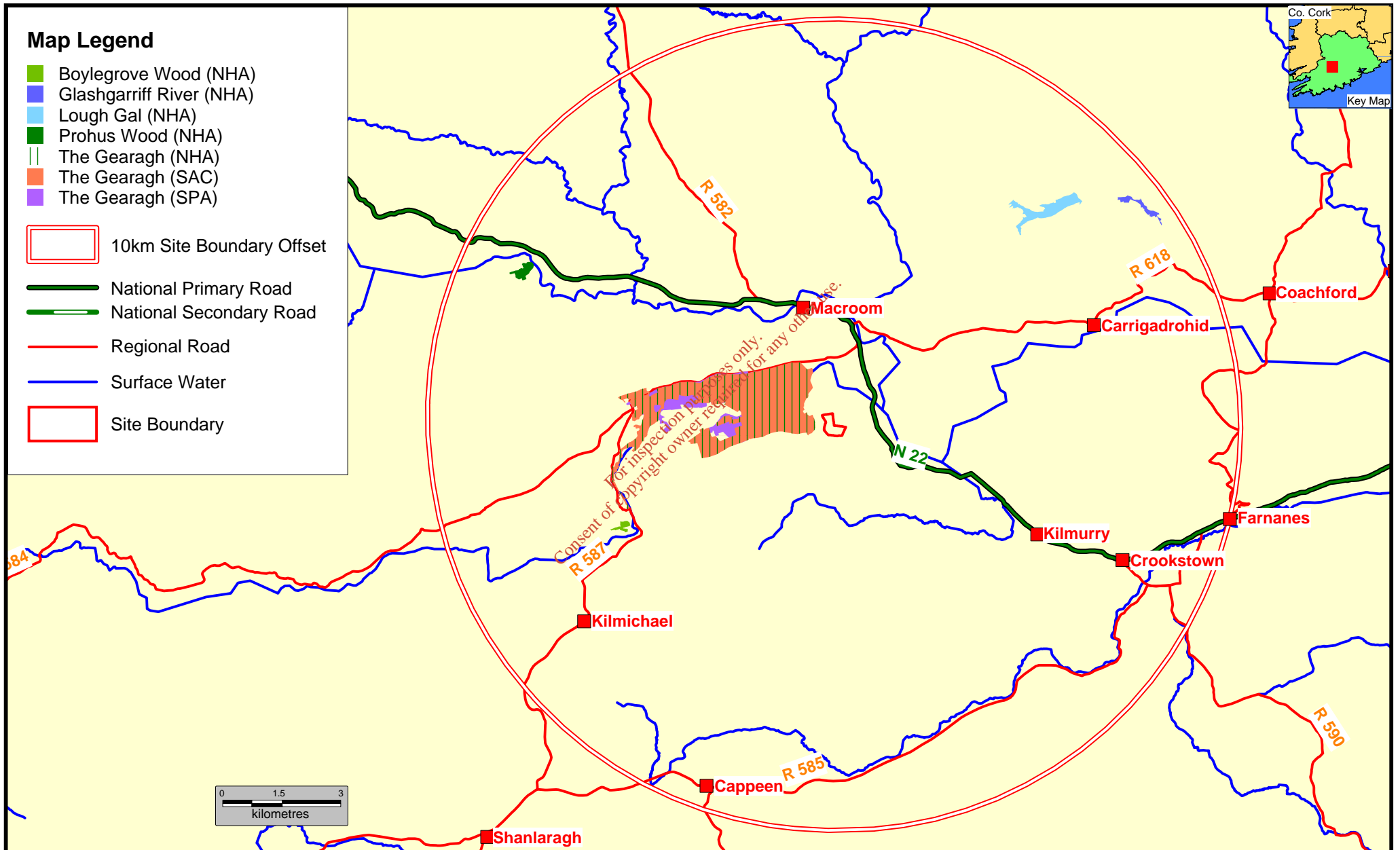
Site Name	Designation	Site Code	Reason for Designation	Minimum Distance from Site (approx.)
The Gearagh	pNHA, cSAC, SPA, Ramsar	pNHA: 108 cSAC: 108 SPA: 109 Ramsar: 7IE018	<p>The alluvial woodland which remains today at the Gearagh is of unique scientific interest, and qualifies as a priority habitat under Annex I of the European Habitats Directive. Extensive swards of Mudwort (<i>Limosella aquatica</i>), a Rare plant listed in the Red Data Book, occur on the mudflats along the reservoir. Otter, an Annex II species on the European Habitats Directive, is frequent throughout the site. The Gearagh supports part of an important wintering bird population including Whooper Swan, Wigeon and Teal.</p> <p>The international importance of the site is recognised by its designation both as a Ramsar site and as a Biogenetic Reserve. The reservoir is also a Wildfowl Sanctuary.</p>	NHA & SAC: 0.2 km SPA: 1.4 km
Boylegrove Wood	pNHA	1854	<p>There is very little information for this site, the An Foras Forbatha report (1972) records that it is a locally important deciduous woodland of mainly Oak (<i>Quercus petraea</i>) and Birch (<i>Betula pubescens</i>). A ranger report (1993) notes that the wood is intact and infrequently grazed, mainly by cattle; there is also some dumping and littering activity occurring in the wood but it is not thought to be seriously damaging the wood.</p>	5.4 km
Glashgarriff River	pNHA	1055	<p>The Glashgarriff River has a notable waterfall and several series of rapids. The wooded, humic valley has regions of seepage and exposed rock. The waterfall was once a site for the legally protected Killarney fern (<i>Trichomanes speciosum</i>) in the last century but it has now disappeared. Otters use this site, a species listed under Annex II of the E.U. Habitats Directive as it is threatened in the E.U. Badgers also occur here, this species is internationally important in the Irish Red Data Book.</p>	9.0 km

**Table 8.1: Summary of designated sites within 10 km of the proposed development (Contd.....)**

Lough Gal	pNHA	1067	<p>Lough Gal is a little known lake now largely grown over by the fen at Curraghindaveagh. The plant communities include floating fen with some peat development especially in the south-west corner. Marshwort (<i>Apium inundatum</i>) and several pondweeds (<i>Potamogeton</i> sp.) occur on the lake.</p> <p>The present Natural Heritage Area includes an extensive area of freshwater marsh with abundant willow (<i>Salix</i> sp.) scrub invasion. A recent survey of the lake reports it to be a good site for wildfowl, ducks, geese and swans. This site contains unusual habitats for the area. The flora of the lough and surrounding wetlands also appear to be of interest.</p>	6.5 km
Prohus Wood	pNHA	1248	<p>This site is a very young wood derived from widespread clearance about forty years ago (1986). The site has not developed much habitat diversity but is developing quite naturally and is of local importance.</p>	8.2 km

For inspection purposes only  
Consent of copyright owner required for any other use





### 8.3.2. Habitats & Botanical Species in the Existing Environment

A total of nine dominant habitat types were identified at the site and in adjacent areas (Figure 8.3), with a total of 62 botanical species (Table 8.2). Scientific names of all botanical species recorded by this study are available in Table 8.2.

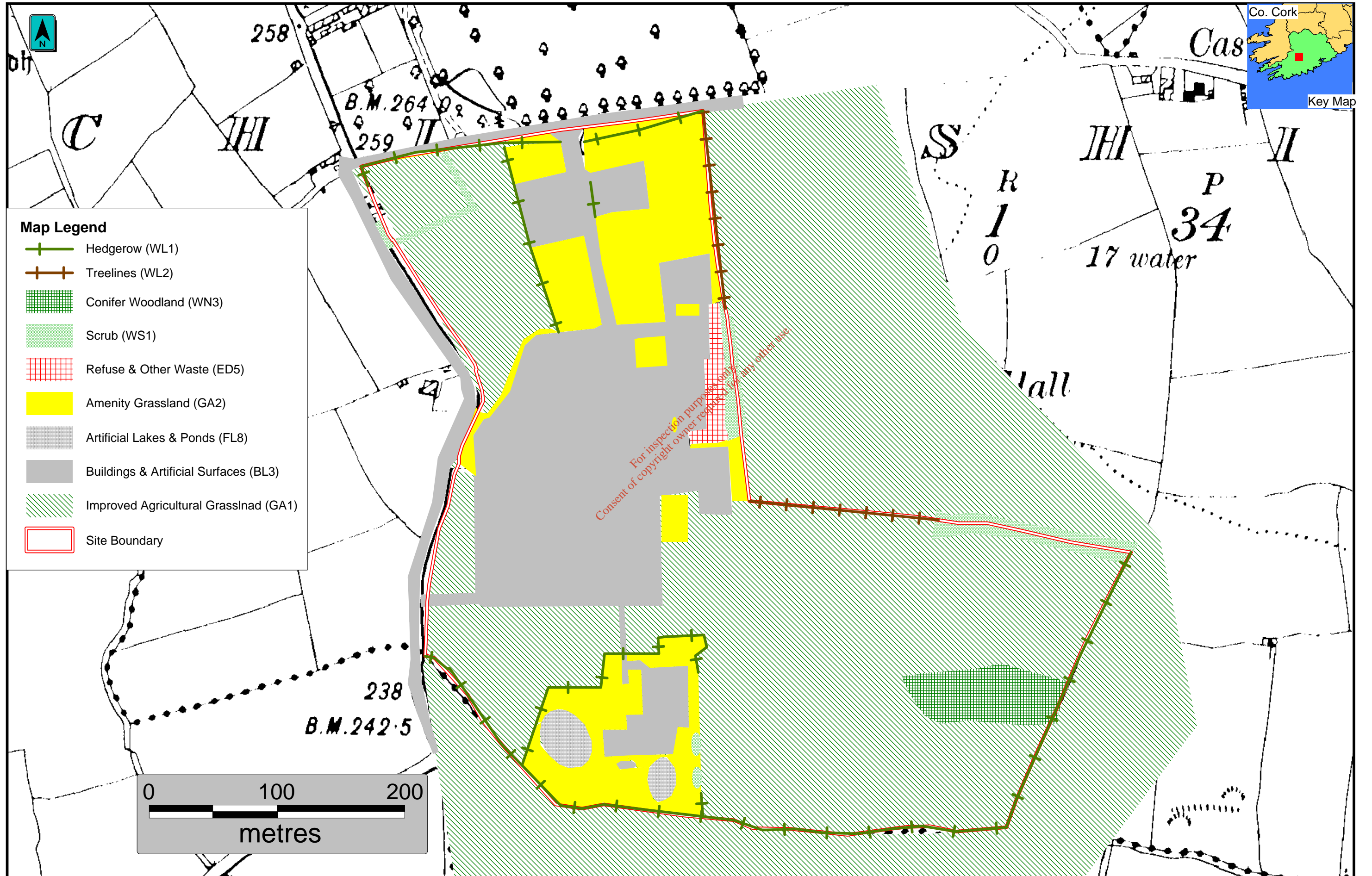
Buildings and artificial surfaces (BL3) are comprised mainly of the existing facility and its associated roads and hard-standing areas. Lichen species were noted on the buildings and artificial surfaces (BL3). The adjacent public roads to the north and west are also classified as buildings and artificial surfaces (BL3).

Amenity grassland (GA2) is present at various locations within the site boundary and largely consists of lawns, some of which are maintained on a regular basis (e.g. lawns at the main entrance). The amenity grassland (GA2) had moss species associated with them. Sections of the site boundary consist of hedgerows (WL1), treelines (WL2) and scrub (WS1), some of which are on earthen banks (BL2). Internal hedgerow (WL1) boundaries are dominated by exotic conifer species of the Cupressaceae family. Hedgerows (WL1) and treelines (WL2) associated with the outer site boundary are more ecologically significant than the internal boundaries. The main exception being the western boundary, which only has two tree species, exotic conifer species of the Cupressaceae family and sycamore, and has a poorly developed understorey.

A temporary storage area for refuse and other waste (ED5) is present at the eastern boundary and included (during the study period) a range of materials such as concrete blocks, metal containers, sand, slag heaps and plastic containers. Even though this area is best classified as refuse and other waste (ED5), not all of the items stored here are waste material. Two artificial ponds (FL8) occur within the wastewater treatment area at the southern boundary. Both of these ponds are used as part of the wastewater treatment works for the present facility, where one of these ponds is used for treatment and the other, which has Common Reed, is used as an attenuation pond area for the treated water before it is released into the River Lee.

Areas within the site boundary consist of improved agricultural grassland (GA1) and at the time of the survey were being grazed by cattle to the southeast and horses to the west. Conifer woodland (WN3) is present within the improved agricultural grassland (GA1) area by the eastern boundary, where the ground flora is dominated by the same grass species as the surrounding agricultural grassland (GA1) (see Table 8.2). Botanical species associated with these habitats are outlined in Table 8.2. Hedgerows (WI1) supported the highest number of botanical species, while conifer woodland (WN3) had the least number of species associated with it (Figure 8.4). The two grassland habitats (GA1 & GA2) had the same number of botanical species (Figure 8.4), but this does not necessarily mean that they shared the same species (e.g. Common Chickweed; Table 8.2).

All the species found by this botanical survey are distributed in the general area (Blamey et al. 2003). In addition, no endangered species or Red Listed species of high conservation concern were recorded by this survey (Curtis & McGough 1988). It must be acknowledged that the timing of the survey in October is sub-optimal for botanical survey work. The proposed development will occur on the hard-standing area of the current facility, with some works within the compound of the existing wastewater treatment works at the southern boundary.



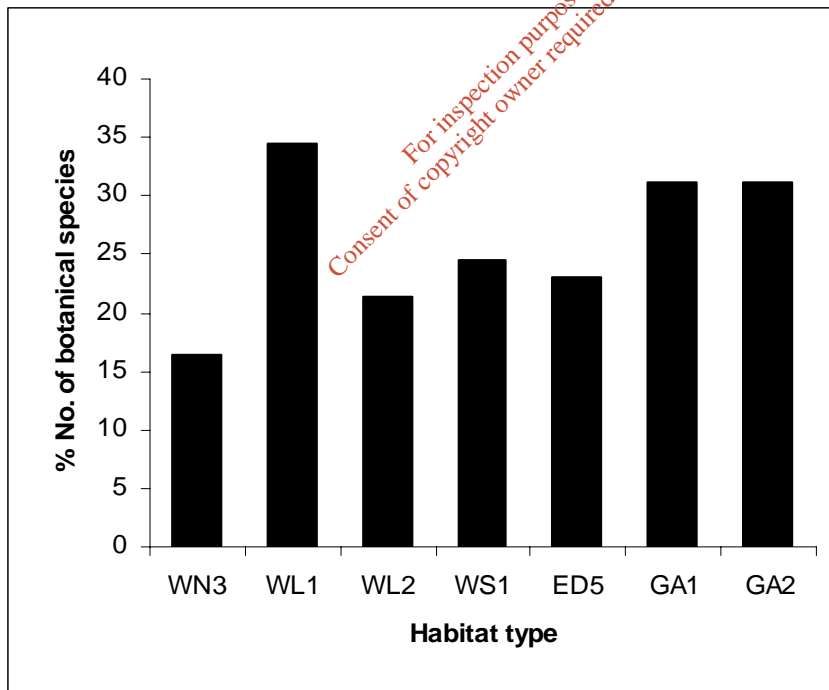
**Table 8.2: Summary of botanical species recorded in the survey area and their main habitat of occurrence**

Common Name	Scientific Name	Habitat of Occurrence
Alder	<i>Alnus glutinosa</i>	WL1
Ash	<i>Fraxinus excelsior</i>	WL2, WS1, WL1
Beech	<i>Fagus sylvatica</i>	WS1, WL1, WN3
Blackthorn	<i>Prunus spinosa</i>	WL1
Bracken	<i>Pteridium aquilinum</i>	WS1, WL1
Bramble	<i>Rubus fruticosus</i>	WL2, ED5, WS1, WL1, GA1, WN3
Broad-leaved Dock	<i>Rumex obtusifolius</i>	GA2, GA1
Charlock	<i>Sinapsis arvensis</i>	GA1
Cleavers	<i>Galium aparine</i>	ED5
Common Bent	<i>Agrostis capillaris</i>	GA2, GA1
Common Chickweed	<i>Stellaria media</i>	GA1
Common Fumitory	<i>Fumaria officinalis</i>	GA1
Common Mouse Ear	<i>Cerastium arvense</i>	GA2, GA1
Common Nettle	<i>Urtica dioica</i>	WL2, ED5, WS1, WL1, GA1, WN3
Common Ragwort	<i>Senecio jacobaea</i>	GA2, ED5
Common Reed	<i>Phragmites australis</i>	FL8
Conifer sp	<i>Cupressaceae family</i>	WL2, WL1 (exotic planted species)
Creeping Buttercup	<i>Ranunculus repens</i>	GA2, ED5, GA1
Daisy	<i>Bellis perennis</i>	GA2
Dandelion	<i>Taraxacum officinale</i>	GA2, ED5
Dog Rose	<i>Rosa canina</i>	WL1
Dovesfoot Cranesbill	<i>Geranium molle</i>	GA2
Eared Willow	<i>Salix aurita</i>	WS1
Elder	<i>Sambucus nigra</i>	WS1
Foxglove	<i>Digitalis purpurea</i>	WL2
Goat Willow	<i>Salix caprea</i>	WS1, WL1
Gorse	<i>Ulex europaeus</i>	WL2, WS1, WL1, WN3
Great Willowherb	<i>Epilobium hirsutum</i>	ED5
Greater Plantain	<i>Plantago major</i>	GA2, ED5, GA1
Grey Willow	<i>Salix cinerea</i>	WL2, WS1, WL1
Hartstongue	<i>Phyllitis scolopendrium</i>	WL2
Hawthorn	<i>Crataegus monogyna</i>	WL2, WS1, WL1, WN3
Hazel	<i>Corylus avellana</i>	WL2, WS1
Herb Robert	<i>Geranium robertianum</i>	GA2
Hogweed	<i>Heracleum sphondylium</i>	WL1
Holly	<i>Ilex aquifolium</i>	WL1
Italian Ryegrass	<i>Lolium multiflorum</i>	GA1, WN3
Ivy	<i>Hedera helix</i>	WL2, ED5, WS1, WL1
Male Fern	<i>Dryopteris filix - mas</i>	WL1
Marsh Pennywort	<i>Hydrocotyle vulgaris</i>	WL1
Meadow Buttercup	<i>Ranunculus acris</i>	ED5, GA1
Meadow Vetchling	<i>Lathyrus pratensis</i>	GA1
Mind-your-own-business	<i>Soleirolia soleirolii</i>	GA2
Montbretia	<i>Crocsmia x crocosmiiflora</i>	GA1
Navelwort	<i>Umbilicus rupestris</i>	WL2, ED5 (on wall), WL1, WN3
Perennial Ryegrass	<i>Lolium perenne</i>	GA1, WN3

**Table 8.2: Summary of botanical species recorded in the survey area and their main habitat of occurrence (Contd.....)**

Red Clover	<i>Trifolium pratense</i>	GA1
Red Dead-nettle	<i>Lamium purpureum</i>	GA1
Ribwort Plantain	<i>Plantago lanceolata</i>	GA2, ED5
Scentless Mayweed	<i>Tripleurospermum inodorum</i>	GA2
Scots Pine	<i>Pinus sylvestris</i>	WN3
Sessile Oak	<i>Quercus petraea</i>	WN3
Shepherds Purse	<i>Capsella bursa-pastoris</i>	GA1
Silverweed	<i>Potentilla anserina</i>	GA2
Sitka Spruce	<i>Pinus sitchensis</i>	WS1, WL1
Smooth Hawksbeard	<i>Crepis capillaris</i>	GA2
Smooth Sow Thistle	<i>Sonchus oleraceus</i>	GA2
Sycamore	<i>Acer pseudoplatanus</i>	WL2, WS1, WL1
Thistle species	<i>Cirsium sp.</i>	GA2, ED5, GA1
Thyme-leaved Sandwort	<i>Arenaria serpyllifolia</i>	ED5
White Clover	<i>Trifolium repens</i>	GA2
Yarrow	<i>Achillea millefolium</i>	GA2

**Figure 8.4: Percentage number of botanical species associated with each habitat type.**



### 8.3.3. Fauna in Existing Environment

#### *Mammal Species in the Existing Environment*

A total of 3 mammal species were recorded using the site. No small mammal species were trapped by the Longworth traps. Rabbit (*Oryctolagus cuniculus*) was the most common and widely distributed mammal with several sightings, burrows and droppings noted throughout the site. Burrows were even present in the slag heaps of the refuse and other waste area located along the eastern boundary of the site. Brown Rat (*Rattus norvegicus*) activity was found in three locations, with burrows noted in a northwestern scrub boundary northwest of the site and hedgerow boundary south of the site. In addition, a dead Brown Rat was found on amenity grassland northeast of the site. The Nutricia facility currently has a comprehensive rodent pest control programme in operation, where bait dispensers are present throughout the site. This programme is under constant review and updated accordingly. The scent of a Fox (*Vulpes vulpes*) was noted along hedgerow west of the wastewater treatment area at the southern end of the site.

The trail camera was triggered by rabbit activity on several occasions but no other mammal species were observed in the post hoc photo analysis.

None of the species recorded at the site are protected by legislation or listed in the Irish Red Data Book (Whilde 1993). However, given the habitats available at the site and surrounding area, other mammal species, not recorded by this study, are likely to pass through or use the site from time to time (e.g. Pygmy Shrew, *Sorex minutes*, Badger *Meles meles*).

#### *Bat Species in the Existing Environment*

The majority of bat species that are known to occur in Ireland have been recorded in the vicinity of Macroom from time to time. Active members of Bat Conservation Ireland have helped to significantly increase the survey coverage in the area in recent years. A number of Ireland's rarest bat species have been recorded in Macroom including Brandt's Bat, *Myotis brandtii* and Lesser-Horseshoe Bat, *Rhinolophus hipposideros* (<http://www.batconservationireland.org/>).

The current survey concentrated on recording the species at or closely adjacent to the existing facility. Recordings made during the survey were analysed to confirm species identifications made in the field. In all, three species were found to occur. Common Pipistrelle, *Pipistrellus pipistrellus* and Soprano Pipistrelle, *Pipistrellus pygmaeus* were common and widely distributed throughout the site. Analysis of recordings made suggests that Common Pipistrelle were detected more than twice as often as Soprano Pipistrelle. There were only two confirmed records of the third species, Brown Long-eared Bat, *Plecotus auritus*. Both records were close to the road running along the western site boundary.

Parts of the survey area are lit at night and it was possible to clearly observe small numbers of bats foraging in these areas throughout the survey night. During the crepuscular period it was also possible to see the bats quite clearly and tentatively identify the species by general field characteristics.

There was no evidence of there being any roost of appreciable size at the site. There was no obvious emergence or return pattern that might indicate the presence of roosting bats.

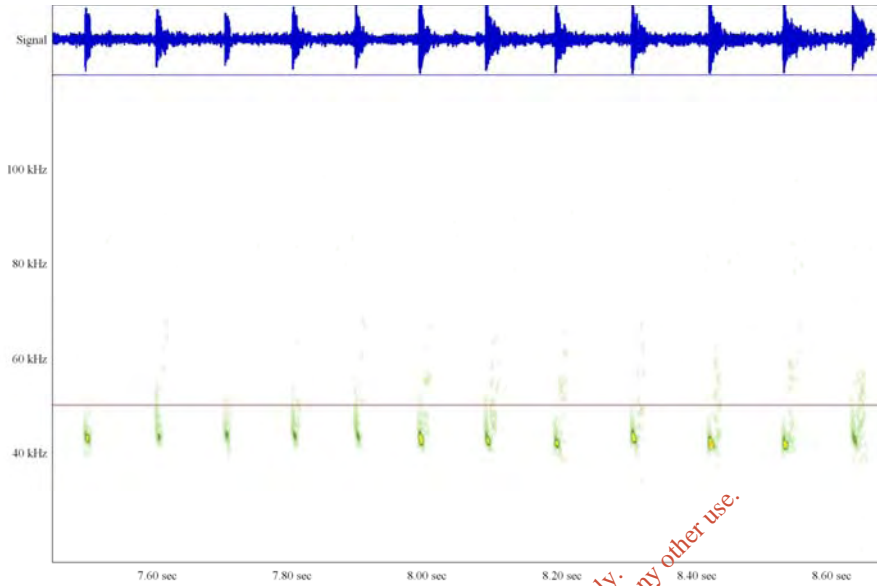
It was apparent, even without sonogram analysis, that the most common bat locally was the Common Pipistrelle (combination of sightings and recognition of heterodyne emissions). There was no evidence of a bimodal distribution of bat activity throughout the night. This is a typical pattern of activity coinciding with roost emergence and at dawn the return of bats to the roost site. In this area bat activity appeared to be spread throughout the night, peaking sporadically but with no apparent pattern that would indicate the presence in the locality of a roost of any significant size. In general the area of greatest bat activity was along the treelines and hedgerows at the boundaries of the site. Common Pipistrelle occurred throughout the site, even foraging under the semi-enclosed milk-intake areas.

Screen captures of the sonogram and power spectrum analysis for Common Pipistrelle, Soprano Pipistrelle and Brown Long-eared Bats are shown in Figures 8.5, 8.6 & 8.7 respectively.

*For inspection purposes only.  
Consent of copyright owner required for any other use.*

**Figure 8.5: Sound analysis of Common Pipistrelle**  
a) Sonogram b) Power Spectrum – note peak at approx 45kHz

a)



b)

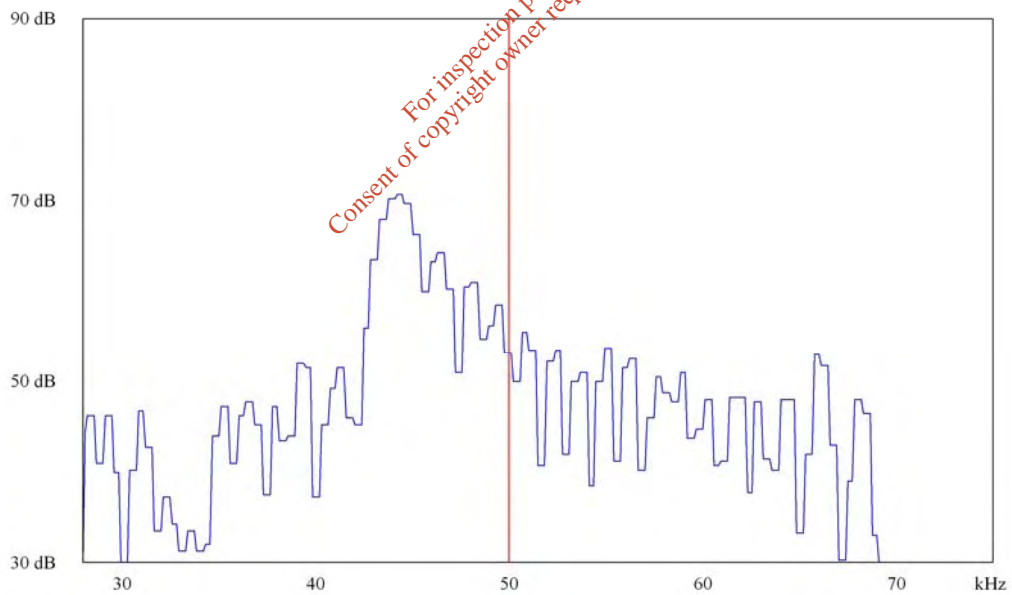
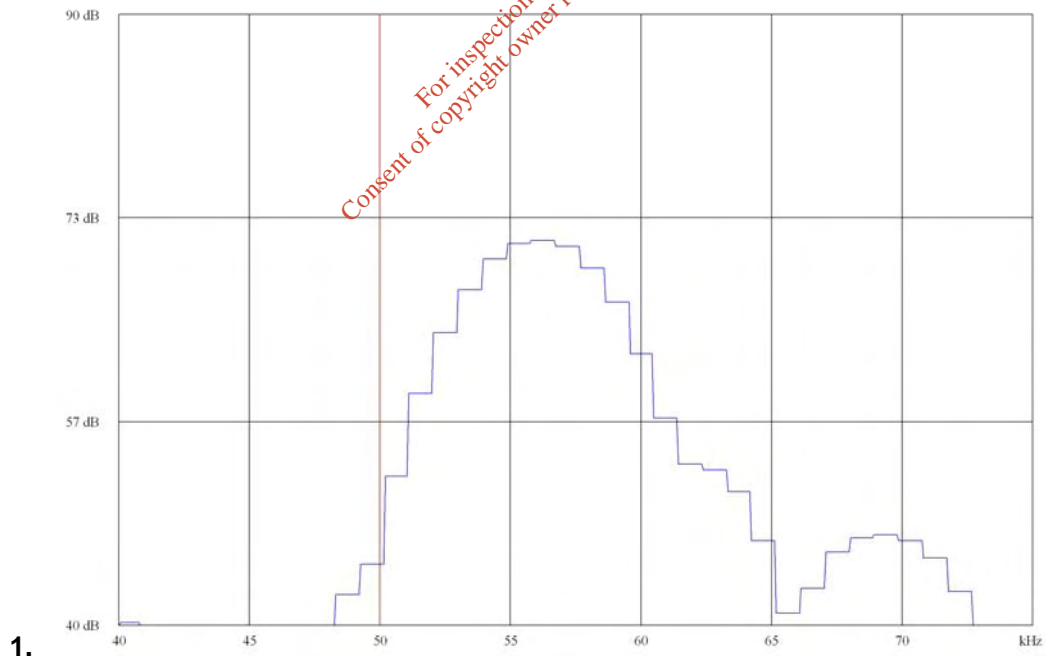
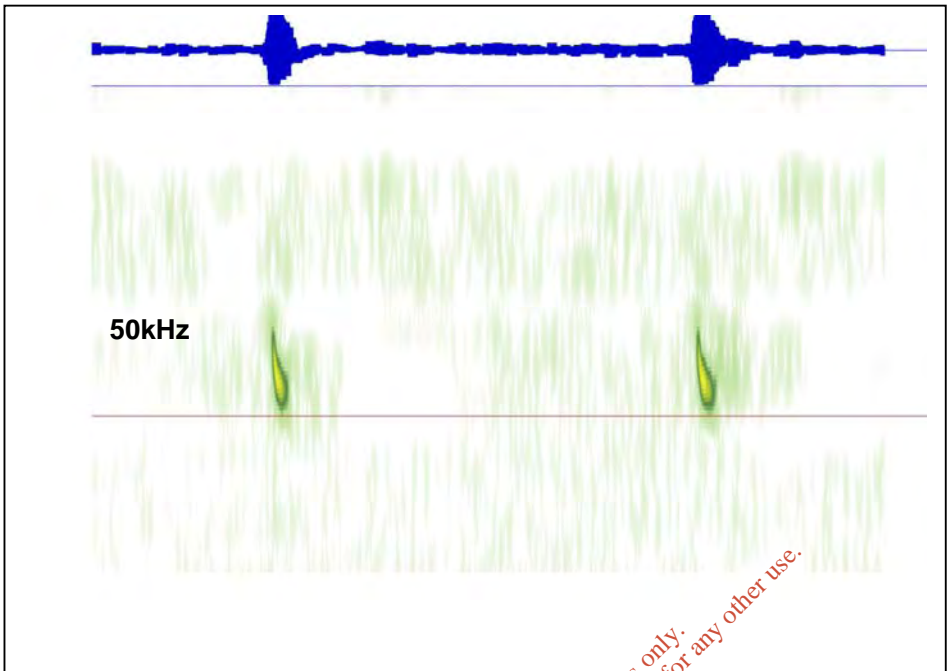


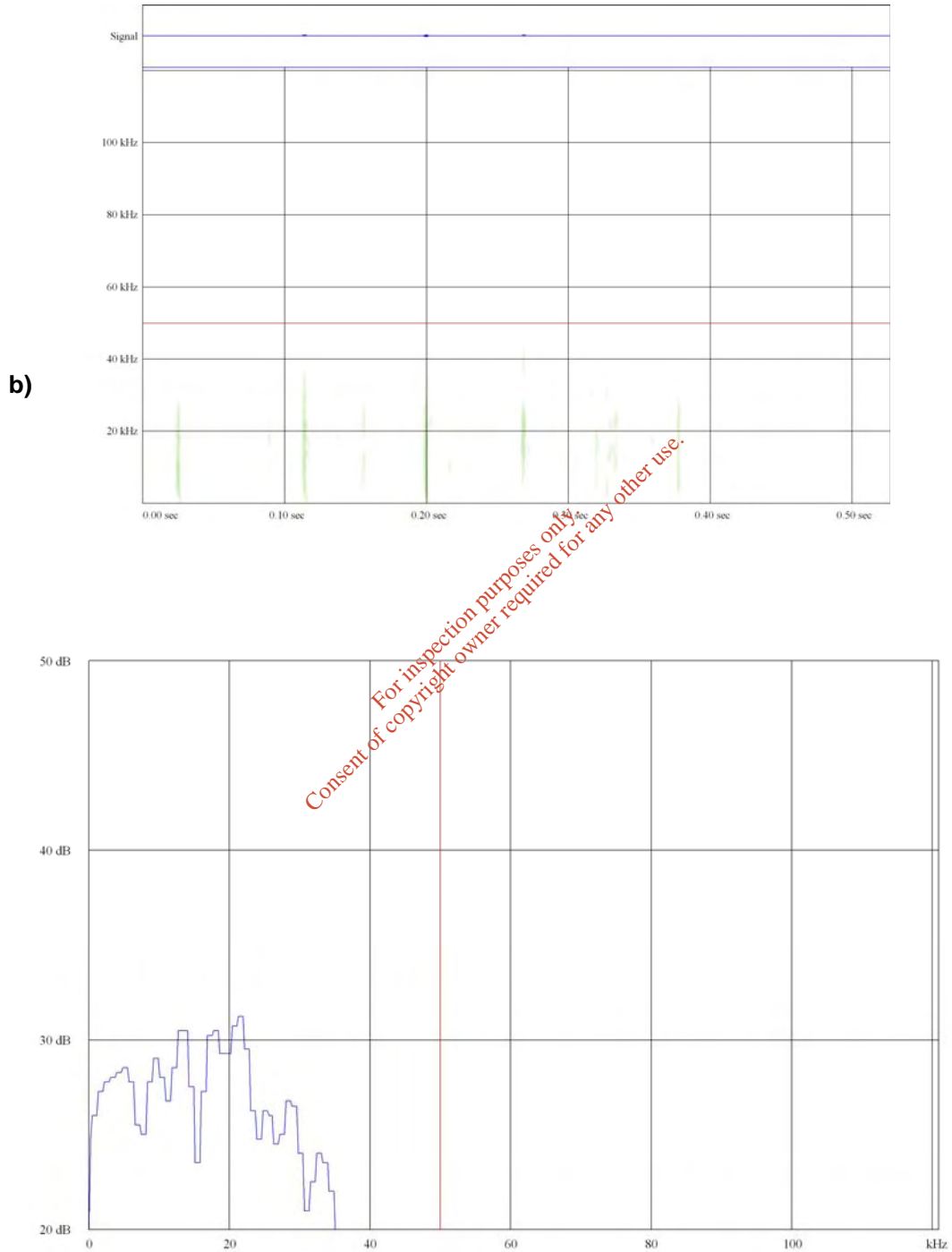


Figure 8.6: Sound analysis of Soprano Pipistrelle  
a) Sonogram b) Power Spectrum – note peak at approx 55kHz



1.

**Figure 8.7: Sound analysis of Brown Long-eared Bat**  
**Sonogram b) Power Spectrum**  
**a)**



### *Birds in the Existing Environment*

Table 8.3 shows the species recorded on transect during the on-site avian survey. In total, 24 species were recorded on the ten survey transects. However, an additional two species were encountered during the survey day – Pheasant, *Phasianus colchicus* was heard calling from farmland to the east of the site and a small party of Long-tailed Tits, *Aegithalos caudatus* were seen near the wastewater treatment facility at the south of the site.

The species recorded in Table 8.3 are listed in decreasing order of overall abundance on transect. Starling, *Sturnus vulgaris*, although only recorded on three of the 10 survey transects were the most abundant species found on-site. They were especially associated with the existing structures, particularly the rooftops, at the plant. On occasion, flocks of several hundred Starlings were observed at roost on the roofs of the plant.

The next most common species at the site were Rook, *Corvus frugilegus*, Robin, *Erithacus rubecula* and Blackbird, *Turdus merula*. In contrast, only single individuals of Raven, *Corvus corax*, and Song Thrush, *Turdus philomelos* were recorded.

The transects that held the greatest species diversity were those that approached the pastoral and amenity grassland areas and associated well vegetated boundaries - Transects 9 & 10 held 14 and 13 bird species respectively. Transect 3 on the other hand was species poor with only 4 species recorded along its length. This transect crossed an area of open yard and field towards the wastewater treatment facility. The most widely distributed species on transect were Rook, Robin and Blackbird – found on 9 & 7 transects respectively.

Table 8.3 also displays the conservation status of the species recorded during the survey. BirdWatch Ireland and the RSPB (Northern Ireland) have agreed a list of priority bird species for conservation action in the whole of Ireland. These *Birds of Conservation Concern in Ireland* are published in a list known as the BoCCI List (BirdWatch Ireland [www.birdwatchireland.ie](http://www.birdwatchireland.ie)). In this BoCCI List, birds are classified into three separate lists (*Red*, *Amber* and *Green*), based on the conservation status of the bird and hence conservation priority. These conservation designations take into account the dangers faced by bird species that occur in Ireland.

*Red-listed* species are of highest conservation concern and *Amber-listed* species are of medium conservation concern; 18 species are currently *Red-listed*, while a further 77 are considered *Amber-listed*. Green-listed species are considered of no particular conservation concern.

As shown in Table 8.3 no *Red-listed* species were recorded during the site survey and only one *Amber-listed* species was encountered, Black-headed Gull, *Larus ridibundus*. Black-headed Gulls have seen a moderate decline in their breeding numbers over recent decades but remain nationally and internationally common. A small flock was observed overflying the southern part of the site in the direction of the lower Carrigdrohid Reservoir. It is unlikely that given the range of habitats and level of human and vehicular activity at the facility that the site is frequented to any significant extent by Black-headed Gulls. The remainder of species observed during the on-site survey are common birds, locally and nationally and are not believed to be of any elevated conservation concern.

The scan surveys of the areas of the Carrigdrohid Reservoir to the west and to the east of the plant confirmed the importance of the Gearagh for a wide variety of waders and wildfowl. The area surveyed encompassed the area east of the cross reservoir walkway (west of the plant) and the narrower waters both sides of Bealahaglashin Bridge. In total 25 species associated with these habitats were recorded (Table 8.4). Several species were abundant in the area, notably Tufted Duck, *Aythya fuligula*, Wigeon, *Anas penelope* and Golden Plover, *Pluvialis apricaria*. In general, the scans were dominated by wildfowl with occasional large flocks of waders such as Golden Plover and Lapwing, *Vanellus vanellus* observed overflying or at rest in nearby fields.

I-WeBS, the Irish Wetland Bird Survey, was launched in 1994 as a joint partnership between BirdWatch Ireland, National Parks & wildlife Service, WWT and WWF-UK. The scheme conducts site counts of waterfowl in Ireland between September and March. Following international convention a wetland is considered important in a national context if it regularly holds 1% or more of one species, subspecies, or population of waterfowl; and of international importance if it regularly supports the same proportion of the relevant international population.

To augment the baseline scan sample data for the waterways in the vicinity of the site summary data for two I-WeBS sub-sites were considered: The Gearagh and the Sullane Delta (Table 8.5 & Table 8.6). These tables present data for the five most recent years available. These data show that the species diversity and overall abundance of over-wintering wildfowl in the area is of great importance. The Gearagh alone has had 44 species recorded during I-WeBS counts between 2000 and 2005. The Gearagh has supported nationally important numbers of several species in recent years including, Teal, *Anas crecca*, Mallard, *Anas platyrhynchos*, Tufted Duck and Golden Plover. The Sullane Delta too has held nationally important numbers of Tufted Duck in recent winters.

Part of the Gearagh (western portion) is designated a Special Protection Area for birds. Two of the species which occur regularly, Whooper Swan, *Cygnus cygnus* and Golden Plover, are listed on Annex I of the E.U. Birds Directive.

#### *Other Fauna*

Other fauna noted within the site boundary included Painted Lady butterfly (*Vanessa cardui*) and a Bumblebee species (*Bombus* sp.). The Painted Lady was seen flying around the refuse and other waste area located east of the site, and is known to occur within the general area (Asher et al. 2001). The Bumblebee species was seen flying around the car park to the northwest of the site. The number of invertebrates on the wing would be expected to be relatively low in November.

**Table 8.3: Avian species recorded during the site survey, November 2006. The Conservation status of each species is indicated by colour – Amber (Medium conservation concern), Green (No special conservation concerns) as per Newton et al., 1999.**

Name	Scientific Name
Starling	<i>Sturnus vulgaris</i>
Rook	<i>Corvus frugilegus</i>
Robin	<i>Erithacus rubecula</i>
Woodpigeon	<i>Columba palumbus</i>
Pied Wagtail	<i>Motacilla alba</i>
Blackbird	<i>Turdus merula</i>
Jackdaw	<i>Corvus monedula</i>
Chaffinch	<i>Fringilla coelebs</i>
Wren	<i>Troglodytes troglodytes</i>
Black-headed Gull	<i>Larus ridibundus</i>
Dunnock	<i>Prunella modularis</i>
Coal Tit	<i>Parus ater</i>
Great Tit	<i>Parus major</i>
Grey Wagtail	<i>Motacilla cinerea</i>
Hooded Crow	<i>Corvus cornix</i>
Greenfinch	<i>Carduelis chloris</i>
Goldfinch	<i>Carduelis carduelis</i>
Goldcrest	<i>Regulus regulus</i>
Redwing	<i>Turdus iliacus</i>
Magpie	<i>Pica pica</i>
Feral Pigeon	<i>Columba livia</i>
Blue Tit	<i>Parus caeruleus</i>
Raven	<i>Corvus corax</i>
Song Thrush	<i>Turdus philomelos</i>

Copyright © 2006. All rights reserved. This document is for inspection purposes only. Copyright owner required for any other use.

**Table 8.4: Avian Species Recorded during the Survey of Aquatic Habitats in the vicinity of the Proposed Development.**

Common Name	Scientific Name	Peak Count
Mute Swan	<i>Cygnus olor</i>	107
Mallard	<i>Anas platyrhynchos</i>	77
Black-headed Gull	<i>Larus ridibundus</i>	14
Wigeon	<i>Anas penelope</i>	458
Great Crested Grebe	<i>Podiceps cristatus</i>	7
Tufted Duck	<i>Aythya fuligula</i>	780
Red Breasted Merganser	<i>Mergus serrator</i>	4
Grey Heron	<i>Ardea cinerea</i>	3
Cormorant	<i>Phalacrocorax carbo</i>	7
Lapwing	<i>Vanellus vanellus</i>	96
Curlew	<i>Numenius arquata</i>	38
Redshank	<i>Tringa totanus</i>	18
Little Grebe	<i>Tachybaptus ruficollis</i>	4
Coot	<i>Fulica atra</i>	42
Common Gull	<i>Larus canus</i>	4
Teal	<i>Anas crecca</i>	266
Greenshank	<i>Tringa nebularia</i>	2
Oystercatcher	<i>Haemoptus ostralegus</i>	10
Whooper Swan	<i>Cygnus cygnus</i>	26
Peregrine Falcon	<i>Peregrinus falco</i>	1
Shoveler	<i>Anas clypeata</i>	6
Moorhen	<i>Gallinula chloropus</i>	1
Golden Plover	<i>Pluvialis apricaria</i>	450
Dunlin	<i>Calidris alpina</i>	65
Snipe	<i>Gallinago gallinago</i>	2

Consent of the copyright owner is required for any other use.

**Table 8.5: I-WeBS summary data for the Gearagh sub-site.**

**The Gearagh**

Species name	1% National	1% International	2000/01	2001/02	2002/03	2003/04	2004/05	Peak 2000/01- 2004/05	Mean 2000/01- 2004/05
Great Northern Diver	20	50	1					1	0
Little Grebe	25	3,400	3	2				3	1
Great Crested Grebe	55	4,800	4	2	2		3	4	2
Cormorant	140	1,200	12	11	15	12	7	15	11
Grey Heron	30	2,700	5	5	4	4	4	5	4
Mute Swan	110	110	104	73	32	43	40	104	58
Whooper Swan	130	210	71	58	40	67	46	71	56
Bean Goose					1			1	0
Pink-footed Goose					1			1	0
European White-fronted Goose					1			1	0
Greenland White-fronted Goose	110	330					1	1	0
Greylag Goose	50	1,000	109	68	102		63	109	68
Shelduck	150	3,000		4				4	1
Wigeon	820	15,000	320	320	530	550	760	760	496
Gadwall	20	600	10	10	4	4	14	14	8
Teal	450	4,000	1,080	400	750	650	2,000	2,000	976
Mallard	380	20,000	325	286	430	350	300	430	338
Pintail	20	600	2	1	2	2	20	20	5
Shoveler	25	400	12	30	18	12	50	50	24
Pochard	380	3,500	33	90	38	65	40	90	53
Ring-necked Duck							1	1	0
Tufted Duck	370	12,000	170	320	340	240	600	600	334
Scaup	45	3,100	7	4	3		5	7	4
Long-tailed Duck	20	20,000		1				1	0
Goldeneye	95	4,000	45	54	42	30	15	54	38
Ruddy Duck						5	1	5	1
Coot	330	17,500	70	132	67	73	276	276	124
Moorhen	20	20,000		2			2	2	1
Ringed Plover	150	730						3	1
Golden Plover	1,700	9,300	6,500	5,600	3,000	3,000	3,000	6,500	4,220
Lapwing	2,100	20,000	1,000	1,500	1,200	750	1,500	1,500	1,190
Dunlin	880	13,300	120	30	100	4	120	120	75
Snipe		20,000		17	2	3	10	17	8
Black-tailed Godwit	140	350					54	54	11
Curlew	550	4,200	150	140	240	150	250	250	186
Redshank	310	0,900	2	1			7	7	2
Greenshank	20	3,000	4	2	1		1	4	2
Green Sandpiper							2	2	0
Common Sandpiper			1	1			1	1	1
Little Gull							1	1	0
Black-headed Gull		20,000	10	14	19	8	10	19	12
Ring-billed Gull					1			1	0
Lesser Black-backed Gull		4,500	73	89	40	14	70	89	57
Kingfisher			1	1			1	1	1

File inspection purposes only. Consent of copyright owners required for any other use.

**Table 8.6: I-WeBS summary data for the Sullane Delta sub-site.**

**Sullane Delta**

Species name	1% National	1% International	2000/01	2001/02	2002/03	2003/04	2004/05	Peak 2000/01- 2004/05	Mean 2000/01- 2004/05
Little Grebe	25	3,400	4					4	1
Great Crested Grebe	55	4,800				2		2	1
Cormorant	140	1,200	1	4		5		5	3
Grey Heron	30	2,700	1	3		2		3	2
Mute Swan	110	110	7			10		10	6
Whooper Swan	130	210	23	25		9		25	19
Greenland White-fronted Goose	110	330		18				18	6
Wigeon	820	15,000	120	70		250		250	147
American Wigeon						1		1	0
Teal	450	4,000	240	300		400		400	313
Mallard	380	20,000		125		300		300	142
Pintail	20	600		3				3	1
Shoveler	25	400	4	2		5		5	4
Pochard	380	3,500	11	18		5		18	11
Lesser Scaup						1		1	0
Tufted Duck	370	12,000	43	140		400		400	194
Scaup	45	3,100				5		5	2
Goldeneye	95	4,000	20	12		10		20	14
Goosander						1		1	0
Coot	330	17,500	27			60		60	29
Moorhen	20	20,000				1		1	0
Golden Plover	1,700	9,300	300			200		300	167
Lapwing	2,100	20,000	70	18		50		70	46
Snipe		20,000	3					3	1
Curlew	550	4,200	160	93		250		250	168
Greenshank	20	3,100	2	2		1		2	2
Black-headed Gull		20,000	1	6		3		6	3
Lesser Black-backed Gull		4,500	22	84				84	35
Kingfisher			1	2		1		2	1

For inspection purposes only.  
Consent of copyright owner required for any other use.



### 8.3.4. Water Quality

A summary of the results of the water quality review of river systems surrounding the proposed development site is available in Table 8.7. The Rivers Lee, Toon, Sullane and Laney have been unpolluted since 2002. The River Cummer, which flows into the River Lee at a location downstream of the discharge point, has changed from an unpolluted status in 1999 to slightly polluted since 2002. Brown Trout (*Salmo trutta*), Salmon (*Salmo salar*) and Pike (*Esox lucius*) are known to collectively occur in these river systems (South Western Regional Fisheries Board webpage, <http://homepage.eircom.net/~swrfb/>). Other aspects of water quality are dealt with in Section 6 of this EIS.

**Table 8.7: Summary of water quality of river systems surrounding the proposed development site.**

River	Location & EPA Station No.	Water Quality Q Rating Index			Pollution Status 2005
		1999	2002	2005	
Lee	Dromcarra Bridge 300	4	4	4	Unpolluted
Toon	Toon Bridge 800	3-4	4	4	Unpolluted
Sullane	Ford u/s Laney River 480	4	4	4	Unpolluted
Laney	Ford's Mill 500	4-5	4-5	4-5	Unpolluted
Cummer	Athsollis Bridge 800	4	3-4	3-4	Slightly polluted

## 8.4. Potential Impacts of the Nutricia Extension Facility on Ecology

### 8.4.1. Potential Impacts on Natural Heritage Areas and Special Areas of Conservation

The proposed extension is not likely to have any impact on the designated sites outlined in Section 8.3.1. The principal site of conservation concern is the Gearagh (NHA, SAC, SPA).

The Gearagh is an important area for its alluvial habitats, unusual botanical species mix and for its importance for a wide range of overwintering waterfowl. The abstraction and discharge of water is monitored to minimise the risk of negative impacts on the waterway. In the current proposal, the quality of the water that is discharged back into the Lee is to be further enhanced by the addition of tertiary treatment measures. This is aimed at considerably reducing the nutrient load of the treated wastewater and to insure compliance with increasingly stringent standards. The measures that are to be put in place to assure the success of the treatment, prior to any discharge taking place, are outlined in detail in Sections 2 and 6 of this EIS.

### 8.4.2. Potential Impacts on Habitats and Flora

The main habitat at the site is man-made buildings and artificial surfaces (BL3) and has a relatively low biodiversity. Most of the planned construction activity will take place within the footprint of the existing plant.

This will have no significant impact on species diversity or abundance. Small areas of improved grassland (GA1) and amenity (GA2) grassland may be affected but these habitats and botanical species are well represented within the site and in the surrounding landscape. In addition, the grazing areas within the site boundary will be retained.

### 8.4.3. Potential Impacts on Fauna

#### *Mammals*

There does not appear to be a diverse mammalian fauna at the site. Rats are controlled by pest management and are not especially common. Rabbits are abundant throughout and it is unlikely that the proposed extension will have any significant impact on their numbers. Undoubtedly several other mammals occur at the site from time to time but it would appear that there are no badger setts or fox dens (active or inactive) at the site. It is likely given the amount of improved grassland and well-vegetated field boundaries at the site that these larger mammals, as well as many smaller mammals, are found at the site from time-to-time. There was no evidence in the current field study that the proposed development would impact on any habitats especially important for mammal species.

#### *Bats*

Bats, especially Common Pipistrelle were relatively common at the site. There was some evidence that lights at the plant attracted bats attempting to exploit the food resource presented by insects gathered around the lamps. On the basis of a recent national survey Common and Soprano Pipistrelle are the most common and second most common species in Ireland respectively (Roche *et al.*, 2005). Both species commonly roost in buildings with the Soprano Pipistrelle believed to form much larger roosts. There is still much to be learned about the differences in the ecology of these cryptic species. All of the three species recorded at the site can travel up to several kilometres a night to feeding grounds. There was no evidence of the presence of roosts of these species at the site itself.

Given the location and scope of the proposed extension, it is unlikely that there will be any adverse impact on the locally occurring bats. However, it is best practice to assume that some bats may roost in the structures on site and that mitigation measures be adopted to negate any potential negative impacts on bats during the construction process.

#### *Aquatic Fauna*

The abstraction and discharge of water into the River Lee could potentially negatively affect aquatic fauna. However, these activities will be monitored to minimise such risk on the local aquatic fauna. In addition, the quality of the water that is discharged back into the Lee will be enhanced by the addition of the upgraded treatment plant and the tertiary treatment process, which is currently being installed. The measures that are to be put in place to assure the success of the treatment, prior to any discharge taking place, are outlined in detail in Sections 2 and 6 of this EIS.

#### 8.4.4. Potential Impacts on Birds

The avian community at the site is entirely typical of the range and type of habitats present. It is dominated by common resident species such as Rook and Robin. With the exception of the overflying, Black-headed Gulls, none of the avian species encountered are of elevated conservation concern. The avian community is a typical farmland bird assemblage.

Unsurprisingly, the areas of greatest species diversity were the field boundaries and treelines at the site. These will not be directly impacted upon by the proposed extension.

The rooftops were used by large numbers of roosting Starlings, and occasionally Corvids. It is likely that Columbidae and occasionally Laridae also use the roofs in significant numbers.

The extension will be contained within the existing footprint of the plant itself. This will have, with mitigation, negligible effects on the wider avian community.

### **8.5. Mitigation Measures for Ecology**

#### 8.5.1. Mitigation Measures

1. Where possible, the destruction or removal of any mature vegetative cover should be conducted outside of the avian breeding season (March-August). This will be offset against the benefits of conducting this work in months that are dry enough to allow movement of heavy machinery without excessive habitat damage. Tree felling and/or habitat removal may require a licence and would require the supervision of a suitably trained person.
2. Mature 'woody' vegetation, that may be important for bats, will be retained as much as possible. The removal of such vegetation and especially shrub and tree felling would optimally be conducted in the periods September-November or April-May to reduce the potential disturbance of any roosting bats.
3. Any restorative landscaping or screening measures will be conducted with the advice of the NPWS and/or a trained botanist or landscape ecologist.
  - a. For example, planting berry shrubs would also improve the local resource value for winter migrants such as Redwing, *Turdus iliacus*.
  - b. Any landscaping features should include provision of plants that afford animals food and shelter. A proportion of these should bear palatable fruit (or seeds) to provide food for mammals and birds. Night scented plants would attract insects to provide additional food for foraging bats.
  - c. The western boundary of sycamore and exotic conifer species of the Cupressaceae family would benefit by planting species representative of the area such as Holly (*Ilex aquifolium*) and Hawthorn (*Crataegus monogyna*).

4. The use of any highly reflective materials in construction will be minimised and the visibility of all above ground structures – including any pipes or cables should be considered. Birds are prone to collision with objects lacking contrast with the surroundings (e.g. California Wind Commission, 1995; Negro & Ferrer, 1995).
5. Excessive lighting at the site will be avoided. This can have a deleterious effect on plant physiology and phenology. Floodlights can also lead to inappropriate night singing by passerines. However, low-level lighting of permanent structures such could help prevent birds colliding with these structures in periods of low-light intensity.
  - a. Where possible mercury vapour lighting should be installed as this type of lighting attracts many more insects than sodium lamps (e.g. Blake *et al.*, 1994).
  - b. If sodium lighting is used high-pressure sodium lamps are favoured as they attract more insects than low-pressure alternatives
6. Waste and refuse generated at the site will be stored in appropriate containers prior to removal off-site by a permitted contractor. Bins, or skips, would certainly attract many scavenging species and also potential mammalian predators. Any on-site refuse/waste disposal facilities will be reviewed and designed to cope with the construction and operational phase of the enlarged facility.
7. Fuel tanks and new milk silos will be bunded and any fuel leaks will be dealt with as quickly as possible. Refuelling and machine repair/maintenance will not occur within 50 m of an aquatic zone. Where possible, buffer zones of at least 10 m width will be established between aquatic zones and construction works. This is easily achieved by this particular development as the nearest aquatic zone is approximately 200 m from the site boundary.
8. Appropriate and adequate measures will be used in the control of suspended solids in run-off from the development. These measures are outlined in Sections 2 and 6 of this EIS.

## 8.6. Conclusions for Ecology

The survey details the local flora and fauna community at the existing Nutricia site. The regions of greatest species diversity occur in the areas of improved grassland and their associated field boundaries. The built environment is of no special ecological importance.

As the proposed development is primarily contained within the footprint of the existing plant the likely ecological impacts are minimal. With the application of the suggested mitigation measures above there should be no significant impacts on the local flora and fauna. It is important however that the wastewater treatment process is carefully designed to minimise the risk of any untreated discharge episodes given the ecological importance of the Gearagh.

---

## 9. LANDSCAPE

---

### 9.1. Introduction

This section describes the existing landscape, the visual character of the existing Nutricia development and the potential visual impact of the proposed extension within the existing site footprint.

The term “landscape” refers primarily to the visual appearance of the area, including its shape, form and colour, and the interaction of these elements to create specific patterns that are distinctive to particular localities. However, the landscape is not purely a visual phenomenon. Its character relies closely on the local physical geography and environmental history. Besides any scenic and/or visual dimension, there are also a whole range of other constituents of significance. These include:

- topography
- ecology
- landscape history
- land use
- buildings and settlement
- architecture.

This section deals with these factors only in so far as they impinge on the landscape and visual characteristics of the locality, setting out how the proposed site development interacts with them and specifying any significant environmental effects.

### 9.2. Existing Landscape

#### 9.2.1. Description of Existing Landscape

The site is located approximately 3.5 km south of Macroom town and approximately 1.5km from the national primary route, the N22 Cork to Killarney Road. The site is located on a plain approximately 70 mOD adjacent to the Lee reservoir as well as the River Lee itself. To the south, the lands rise sharply to approximately 160 mOD, while the lands to the north and east undulate.

The surrounding land use is agricultural, dominated by pastoral activities which are linked directly with the Nutricia facility through the supply of whole milk. There are 35 dwellings within 1km of the site boundary. There is a small commercial development to the north of the site. An industrial park is located to the north-east of the site along the R584, adjacent to the former General Semi-Conductor Facility and electricity sub-station.

The existing Nutricia site is visible from the Gearagh to the east, with some restricted views from dwellings to the west. The views from these locations at present are restricted to the tops of the tallest buildings, with the highest being approximately 32 m above ground level.

There are clear views however of the facility including low level structures, from the upland area to the south of the site.

Existing screening of the facility along its northern boundaries (i.e. along Castleview Road) consists of well maintained evergreen hedges consisting of the species Cypress. This hedge line largely screens (with the exception of the site entrance) the facility from vehicles and pedestrians along the road.

The western boundary of the facility is bounded by a 3 - 4 m high tree line of mature evergreens. This tree line is patchy in places and allows intermittent views of the site for road users and pedestrians.

### 9.2.2. Landscape Character

Cork County Council carried out a Landscape Character Assessment of the county in compliance with the Local Government (Planning and Development) Act, 2000 and the Governments Draft Guidelines for Landscape and Landscape Assessment (2000) in order to establish a set of 76 landscape character areas reflecting the complexity and diversity of the entire county. For a more general and practical understanding at county level the landscape character areas have been amalgamated into a set of 16 no. generic landscape types based on similarities evident within the various areas.

The facility is located in an area designated with the landscape type, *Hilly River and Reservoir Valleys* (Generic Landscape Type No. 8). It is specifically within Area 56, The Lee Reservoir which is *Rolling Patchwork Hills and Lake*.

### 9.2.3. County Scenic Routes

The Cork County Development Plan 2005 - 2011 lists 7 scenic routes within 10 km of the site. These are outlined in Table 9.1 and illustrated on Figure 9.1. The closest scenic route is the A38, which is approximately 4 km to the north of the site.

**Table 9.1: Scenic Routes**

No	Scenic Route
A22	Roads at Mushera in the Boggeragh mountains and roads from Mushera to Ballynagree, Lackdoha and Rylane Cross
A24	Road at Carriganimmy
A26	Road between Macroom and Derrynasaggart
A35	Road between Inchigeela and Rossmore
A36	Road between Dromcarra and Rossmore
A38	Road between Leemount and Macroom via Coachford
A84	Roads adjoining Terelton-scenic views

#### 9.2.4. County Scenic Landscapes

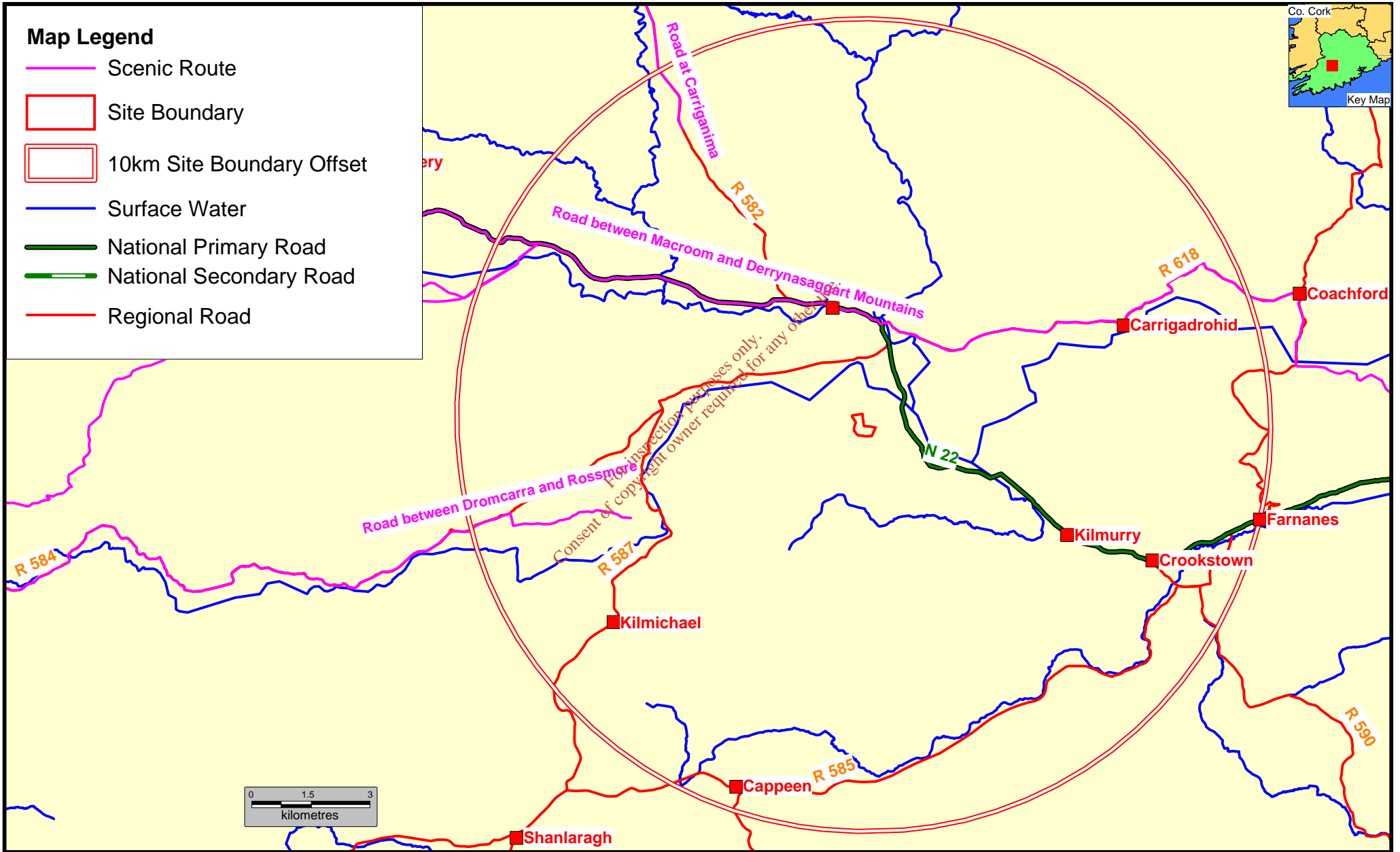
The County Development Plan identifies 3 scenic landscape areas within 10 km of the facility, the closest being some 2 km north west of the existing facility. This scenic view borders the Gearagh which is a cSAC (0108), pNHA (0108) and SPA (109). Scenic landscapes are defined as “*those areas of natural beauty and the important view and prospects that people in Cork (and visitors to the County) value most highly*”.

The two other scenic landscapes are located approximately 3 km and 7 km north west and north east of the site respectively.

#### 9.2.5. Visual Envelope

The visual envelope is the extent of potential visibility of the site to or from a specific area or feature. The visual envelope for the existing Nutricia facility is defined by the immediate flat land to the west of the site and to the immediate north-east which encompasses a section of the N22, where the visual envelope is high. The visual envelope is reduced to the north, south and east by hilly ground which restricts visibility beyond the top of these peaks.

For inspection purposes only.  
Consent of copyright owner required for any other use.





### 9.3. Potential Visual and Landscape Impacts

#### 9.3.1. Proposed Development

The proposed extension to the Nutricia facility is to facilitate an increase in the rate of milk processing and baby powder production at the facility. The proposed extension will consist of a number of works including the upgrading of the existing wastewater treatment plant, the extension to the canteen, laboratory and employee services area. The visual impact of these developments on the surrounding environment will be low as they will be low level structures.

The most significant potential visual impacts will arise from the construction of a second drying tower and evaporator adjacent to the existing tower which is over 31 m high. The proposed second tower will be approximately 38 m high.

#### 9.3.2. Scope of Impacts

The following items of the proposed extension are the main elements that could contribute to an impact on landscape and visual views:

- Proposed buildings including – the new drying and evaporating tower and boiler stack
- Proposed site services, including the extension of the wastewater treatment plant, cooling tower, lighting, security fencing.

#### 9.3.3. Visual Impact Assessment

Visual impact may occur by means of intrusion and/or obstruction where these terms are defined as follows:

**Visual Intrusion:** Impact on view without blocking, and

**Visual Obstruction:** Impact on view involving blocking thereof.

Visual impacts by means of intrusion or obstruction on a particular view may be viewed as positive, neutral or negative and can be rated as follows:

- *Little/None* arises where the proposal is adequately screened by existing landform, vegetation or built environment.
- *Low* arises where views affected by the proposal form only a small element in the overall panorama.
- *Moderate* arises where an appreciable segment of the panorama is affected or where there is an intrusion into the foreground.
- *High* arises where the view is significantly affected, obstructed or so dominated by the proposal as to form the focus of attention.

#### 9.3.4. Assessment of Landscape Viewpoints

In an attempt to determine the visual extent of the proposed extension, a number of photographs were taken from locations in the surrounding area. These selected views illustrate the location and visibility of the existing development. The selected locations for photographic illustrations are shown on Figure 9.3 and are outlined below:

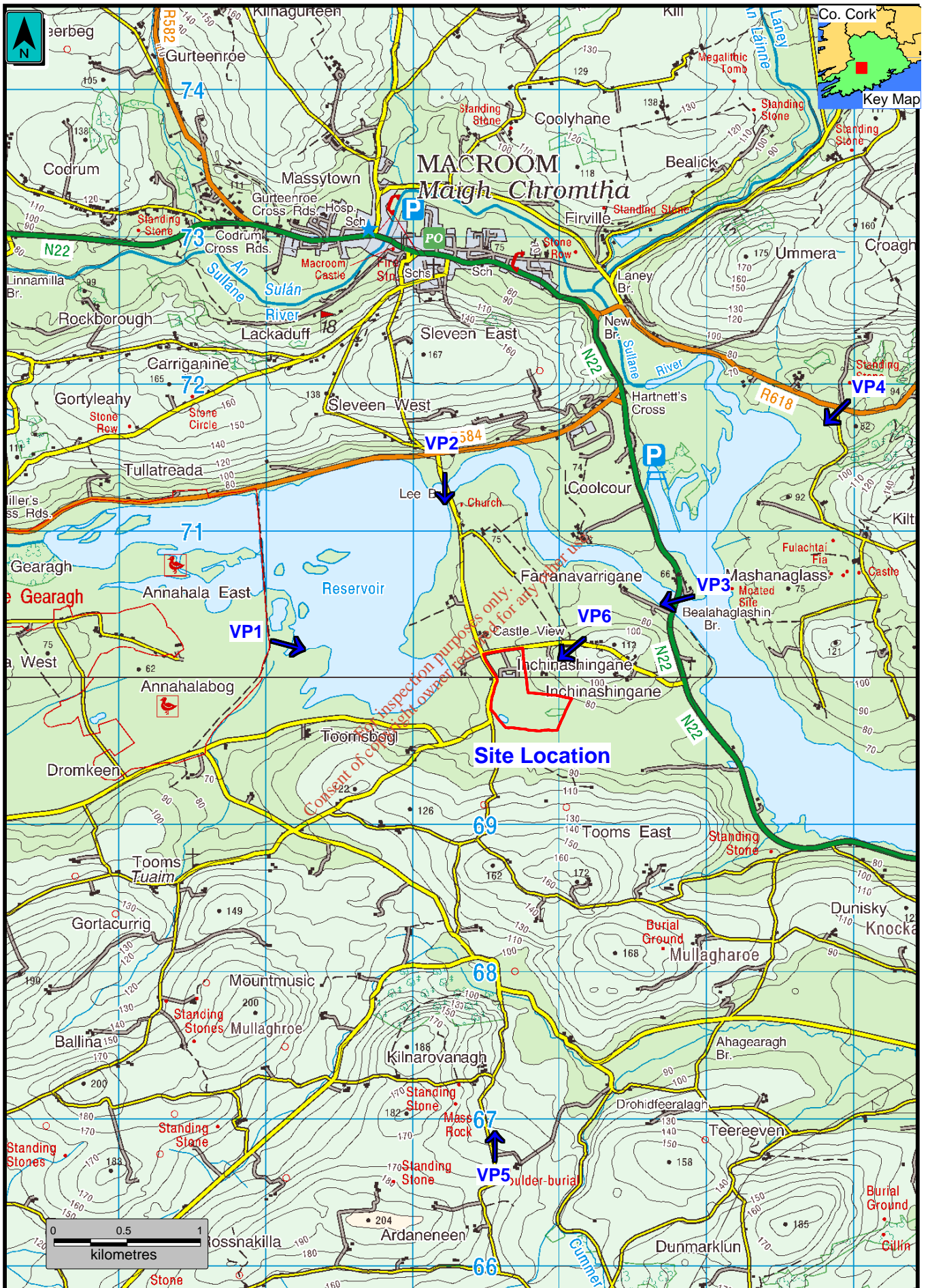
- Viewpoint 1: From the Gearagh (cSAC) looking east towards the facility
- Viewpoint 2: From the Lee Bridge, looking south towards the facility
- Viewpoint 3: From Bealahaglashin Bridge, looking west towards the facility
- Viewpoint 4: From the Scenic Route, the A38, looking south-west towards the site
- Viewpoint 5: From the Upland area of Tooms East, looking northwards into the site
- Viewpoint 6: From the Old School House, looking south west towards the site.

Where the site was clearly visible in the existing environment, photomontages were created whereby the extent of the proposed extension was superimposed on the existing view using computer software. This was done for Viewpoints 1 and 6.

Views were taken from all aspects of the facility including the neighbouring Gearagh, at dwellings to the north east of the site and from the nearest scenic route, the A38 Road between Leemount and Macroom via Coachford.

The potential visual impacts of the proposed extension to the Nutricia facility on each of the six viewpoints were assessed in terms of:

- Changes in existing views
- Public amenity impact



Viewpoint Location Map

Viewpoint 1: From the Gearagh (cSAC) looking east towards the facility

This viewpoint was taken from the road connecting the northern and southern sides of the Gearagh looking eastwards towards the site, approximately 1.2 km away. Figure 9.3 illustrates the existing and potential views of the Nutricia facility from this viewpoint.

The site is evident in the background of the existing view with the evaporator, drying tower and bag-off buildings being the main visual elements of the site. The foreground and middle ground is dominated by the Lee reservoir and the natural habitat of the Gearagh.

A computerised image has been created (Refer to Figure 9.3) to illustrate the visual impacts of the extension. As can be seen from Figure 9.3 the visual impacts from the proposed extension will be confined to the far left background of the viewpoint. Visual intrusion may occur during construction but this will be of short duration.

On completion of the proposed extension, the new drying tower and evaporator will be visible to the right of the existing building elements. This new building will be constructed using a similar exterior finish as those of the existing buildings and will be clustered with the existing visible buildings reducing the visual spread of the development. The overall impact is therefore considered low to moderate.

For inspection purposes only.  
Consent of copyright owner required for any other use.

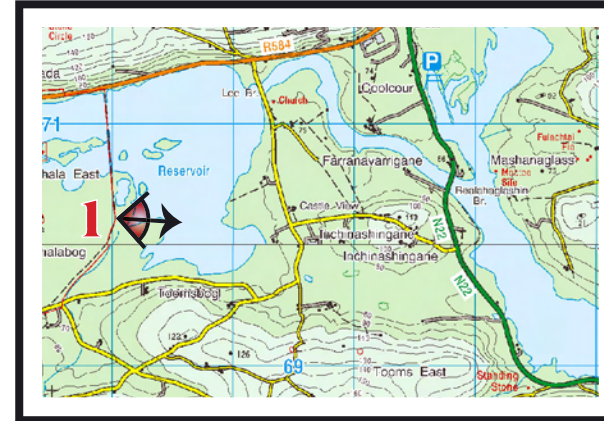


EXISTING VIEW



PROPOSED VIEW

For inspection purposes only.  
Consent of copyright owner required for any other use.



Ordnance Survey Ireland Licence no. EN 0001206 © Government of Ireland

**Notes:**

Photographs taken in November 2006 with a standard 50mm lens.

Revision A - Issue for EIS  
Date of Issue - November 2006  
Photomontage Prepared by  
Fehily Timoney and Company,  
Core House,  
Pouladuff Road, Cork



SK/ME  
2006/524/01/la-neis\_fig93

**VIEW No. 1**  
from  
The Gearagh Looking East  
Towards the Facility

ENVIRONMENTAL IMPACT STATEMENT  
FOR PROPOSED EXTENSION TO  
DAIRYGOLD FOODS FACILITY AT  
MACROOM, CO. CORK

**FIGURE 9.3**

Viewpoint 2: From the Lee Bridge, looking south towards the facility

This viewpoint was taken from Lee Bridge looking southwards towards the site.

This viewpoint was taken to the north of the site at a distance of approximately 1 km from the site boundary. The Lee reservoir and trees dominate the middle ground as indicated in Figure 9.4. The hilly characteristics of the landscape are evident in the right background. The site is located in the left background but is not visible due to screening from the middle ground trees.

*Potential Visual Impact*

The proposed extension to the Nutricia facility will have no impact on this viewpoint.

**Figure 9.4: Viewpoint 2 – From the Lee Bridge**



Viewpoint 3: From Bealahaglashin Bridge, looking west towards the facility

This viewpoint was taken from Bealahaglashin Bridge on the N22. This viewpoint is located north east of the Nutricia site approximately 1 km away. Figure 9.5 illustrates the views from this location.

This view is dominated by the reservoir in the foreground and middle ground. The background is comprised of woodland and rolling hills characteristic of the landscape type. The site is located in the right background and is not visible due to screening by hilly ground.

*Potential Visual Impact*

The topography of the land at this viewpoint provides natural screening of the Nutricia facility and therefore the proposed works at the site will have no visual impact.

Viewpoint 4: From the Scenic Route, the A38, looking south-west towards the site

This viewpoint was taken from the R316 road which has been designated a scenic route and which extends from Leemount to Macroom via Coachford. The views from this location are illustrated on Figure 9.6.

This viewpoint was taken to the north-east of the site at a distance of approximately 2.5 km from the site boundary. The foreground is predominantly agricultural fields as far as the reservoir in the middle ground. The background landscape characteristic is hilly ground. There are some dwellings in the background in addition to the commercial developments, with the R584 in the right of the background. The bell tower of the converted school house near the Nutricia site is barely visible to the left of the background. There is no visibility of the site in this viewpoint.

*Potential Visual Impact*

The proposed works at the Nutricia site may have some low impact from this site with the top of the new building being visible.

Viewpoint 5: From the Upland area of Tooms East, looking northwards into the site

This viewpoint was taken from a third class road in Tooms East close to dwelling number 33 (refer to Figure 3.1). Figure 9.7 illustrates the existing view from this location.

This viewpoint was taken to the south of the site on elevated lands which over look the existing facility. The foreground and middle ground are predominantly agricultural fields. The Gearagh and Lee Reservoir dominate the left middle ground and the Nutricia site is visible in the centre middle ground. The commercial park and substation on the R584 route are visible to the right of the Nutricia site in the background. There are a number of one-off dwellings scattered throughout the landscape with hilly agricultural land visible in the distance.

### *Potential Visual Impact*

A significant proportion of the proposed extension will be visible from this viewpoint due to the elevation of the view and the south facing aspect of the site. The proposed dryer and evaporator building and the new boiler stack will be the most visible elements of the proposed extension from this viewpoint. Some impacts will be minimised by clustering the building and stack with existing structures. The addition of the new visual elements will also be reduced by using existing fascia colours which will blend in with existing buildings. The overall impact is therefore considered low to moderate.

#### Viewpoint 6: From the Old School House, looking south west towards the site

This viewpoint was taken on the Castlevue road leading to the Nutricia site at dwelling number 8 (refer to Figure 3.1). This dwelling is a converted schoolhouse and the rear of the dwelling is overlooking the Nutricia facility. Figure 9.8 illustrates the existing view from this location.

This viewpoint was chosen as it was representative of the most visible view from a cluster of houses located along this road. Topography and existing vegetation largely screens a number of dwellings located adjacent to this viewpoint.

This viewpoint was taken to the immediate east of the site at a distance of 300 m from the site boundary. The foreground shows dwelling no. 8. The existing dryer building and boiler stacks are visible in the middle ground but screening from the land contours and vegetation reduces overall visibility of the site. The background landscape is hilly ground.

### *Potential Visual Impact*

Figure 9.8 also illustrates the potential views of the proposed extension. The new dryer/evaporator building and the boiler stacks will be the most visible elements in this viewpoint after construction. The design of the above elements will mitigate some of the impact by clustering the building and stack with the existing visible evaporator building and stacks. The addition of the new visual elements will also be reduced by using existing fascia colours which will blend in with existing buildings. The overall impact is considered moderate to high.





Fehily Timoney & Company

View Point 3: From Bealahaglashin Bridge, Looking West Towards the Facility



Fehily Timoney & Company

View Point 4: From The Scenic Route, Looking South-West Towards the Facility



Fehily Timoney & Company

View Point 5: From The Upland Area of Tooms East, Looking Northwards Into the Facility



EXISTING VIEW



PROPOSED VIEW



Ordnance Survey Ireland Licence no. EN 0001206 © Government of Ireland

**Notes:**

Photographs taken in November 2006 with a standard 50mm lens.

Revision A - Issue for EIS  
 Date of Issue - November 2006  
 Photomontage Prepared by  
 Fehily Timoney and Company,  
 Core House,  
 Pouladuff Road, Cork



SK/ME  
 2006/524/01/la-neis\_fig98

**VIEW No. 6**  
 From the Old School House,  
 Looking South West  
 Towards the Site

ENVIRONMENTAL IMPACT STATEMENT  
 FOR PROPOSED EXTENSION TO  
 DAIRYGOLD FOODS FACILITY AT  
 MACROOM, CO. CORK

**FIGURE 9.8**

### 9.3.5. Discussion of Potential Visual Impacts

The site was developed in 1979. The visual impact of the existing buildings and site layout is limited to a number of locations. There is visual abatement from vegetative screening and from land contours in some areas as seen in viewpoints 2 to 4. The visual impact of the existing site increases where the landform is flat or gently undulates such as from the land adjacent to the Lee reservoirs and the Gearagh and from upland areas to the South and North East of the site. This is evident in viewpoints 1, 5 and 6.

Impacts from the proposed extension relate to landcover impacts and the visual impacts to viewers in the surrounding area. The proposed extension will include the erection of a new building within the existing site footprint which will be approximately 7 m higher than existing structures. The additional height of this building is required for the installation of an air abatement system which will mitigate powder emissions from the site.

This building is being erected within the existing footprint of buildings on-site (Refer to Figure 2.1). This layout will lead to the new extension being clustered within the existing buildings and the external finish of this building will be similar to the existing buildings. The visual impact of this section of the site will be high at views adjacent to the site (viewpoint 1, 5 and 6).

The upgrades and extensions to the existing effluent treatment plant, existing laboratory and employee service area, storage silos and bund and the existing powder storage building are all within the current footprint and will not extend above their current heights or the heights of existing adjacent buildings. These works will not increase the existing skyline of the site and all external sides will have external finishing similar to the existing development.

The new boiler stack, which will be approximately 35 m high, will only be visible on the site skyline from northerly or southerly directions. Since the proposed stack is of a similar height to the existing stack, they will screen each other from easterly and westerly directions.

## **9.4. Mitigation Measures**

The landscape mitigation measures are employed in the proposal design. The new buildings are within the footprint of existing buildings and from some views, the vertical scope of the buildings does not change significantly as they have been clustered to reduce the overall visual unit. The building design is consistent with existing site buildings and similar finishes will be used to blend with those existing.

All the other proposed works are of lesser heights and existing site features will reduce visibility of these buildings and infrastructure.

The colour and finishes selected for all new buildings at the facility will continue to be selected in accordance with an overall colour scheme taking into account the surrounding environment, the scale of the buildings concerned and the local landscape context.

The existing dense vegetation adjacent to the entrance of the site will be maintained, thus minimising the visual impact on road users.

The existing vegetation along the western boundary of the site will be augmented where possible, particularly at low level by some supplementary planting measures which will serve the dual purposes of visual screening and ecological enhancement. This will be done wherever possible along this boundary, albeit allowing for the new site entrance required by Cork County Council.

## 9.5. Conclusions

A desk top study established landscape character, scenic routes and scenic areas within 10km of the site boundary. Six viewpoints were selected to assess the existing visual impact of the site on the surrounding areas. An assessment of the viewpoints has indicated that there will be some impacts on the visual landscape from certain views. These will generally be restricted to the tops of the buildings, with the exception of views from the upland areas to the south of the site where the entire facility is visible in some instances.

However, the landscape context of the site and surrounding area has progressively changed over the years from a predominately rural area to an area where one off housing is abundant and other industrial activities such as an IDA park have be established. It must be also noted that this facility is an existing facility, established in the area since 1979. Therefore, the visual impacts from the extension of this site when compared to the development of a greenfield site are far lower.

For inspection purposes only  
Consent of copyright owner required for reproduction

---

## 10. LAND USE

---

### 10.1. Introduction

This section examines land use within the surrounding area of the development in terms of:

- Existing environment
- Potential impacts from the proposed development
- Proposed mitigation measures

### 10.2. Land Use in the Existing Environment

The existing Nutricia facility is in the townland of Inchinashingane and occupies an area of approximately 18.2 ha and is approximately 3.5 km south of Macroom town. The proposed extension will occur within the existing site boundary and will not encroach on other lands.

The site lies within the Lee Valley corridor and within a 1 km radius is bounded on three sides by lakes, reservoirs and the River Lee of the Upper Lee Valley. The surrounding land use is a mixture of agricultural, forestry, residential and commercial/infrastructural developments.

The commercial/infrastructural element consists of the Nutricia manufacturing facility and an ESB substation and an IDA estate located on the Inchigeela/Bantry (R584) road approximately 2 km north east of the Nutricia facility. In addition, there is a local enterprise which is located 50m to the north of the facility.

The predominant land use in the wider area is agriculture, forestry, tourism and angling as indicated on Figure 10.1.

The site is located approximately 1 km south west of the Lee Bridge which marks the eastern boundary of 'The Gearagh', an area declared as a statutory nature reserve under the Wildlife Act, 1976. This area represents one of the only remaining examples of post-glacial alluvial woodlands in Western Europe. This picturesque area is a popular destination for eco-tourists. The Gearagh is designated as a candidate Special Area of Conservation (cSAC), a National Heritage Area (NHA) and a Special Protection Area (SPA).

The Upper Lee Catchment Area is also a popular destination for coarse fishing. The dominant fish species stocked are Bream and Rudd.

There are 35 houses within 1 km of the site boundary. The closest house to the facility is some 32 m from the western boundary of the site.

The site itself is not contained within any of the following designations:

- National Heritage Areas (NHA)
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)

### **10.3. Potential Impacts on Land Use**

The impact of the proposed development on land use is considered in the context of the existing land use.

The existing site covers a total area of approximately 18.2 ha of land. The new buildings and associated infrastructure will be constructed within the site boundary. Therefore, no additional landfill will be required. Some 6 ha within the site boundary is currently used for grazing. This land-use will be retained.

A flora and fauna survey conducted on the site as part of this proposal concluded that there were no species of conservation importance on the site.

The greatest potential impacts of the proposed extension will be on the amenity of local residences. This impact could occur due to increases in traffic, noise and visual impact. However, the implementation of mitigation measures in relation to traffic, noise, air, and visual amenity as proposed in the relevant sections of the EIS will ensure that there are no significant adverse impacts on residential amenity.

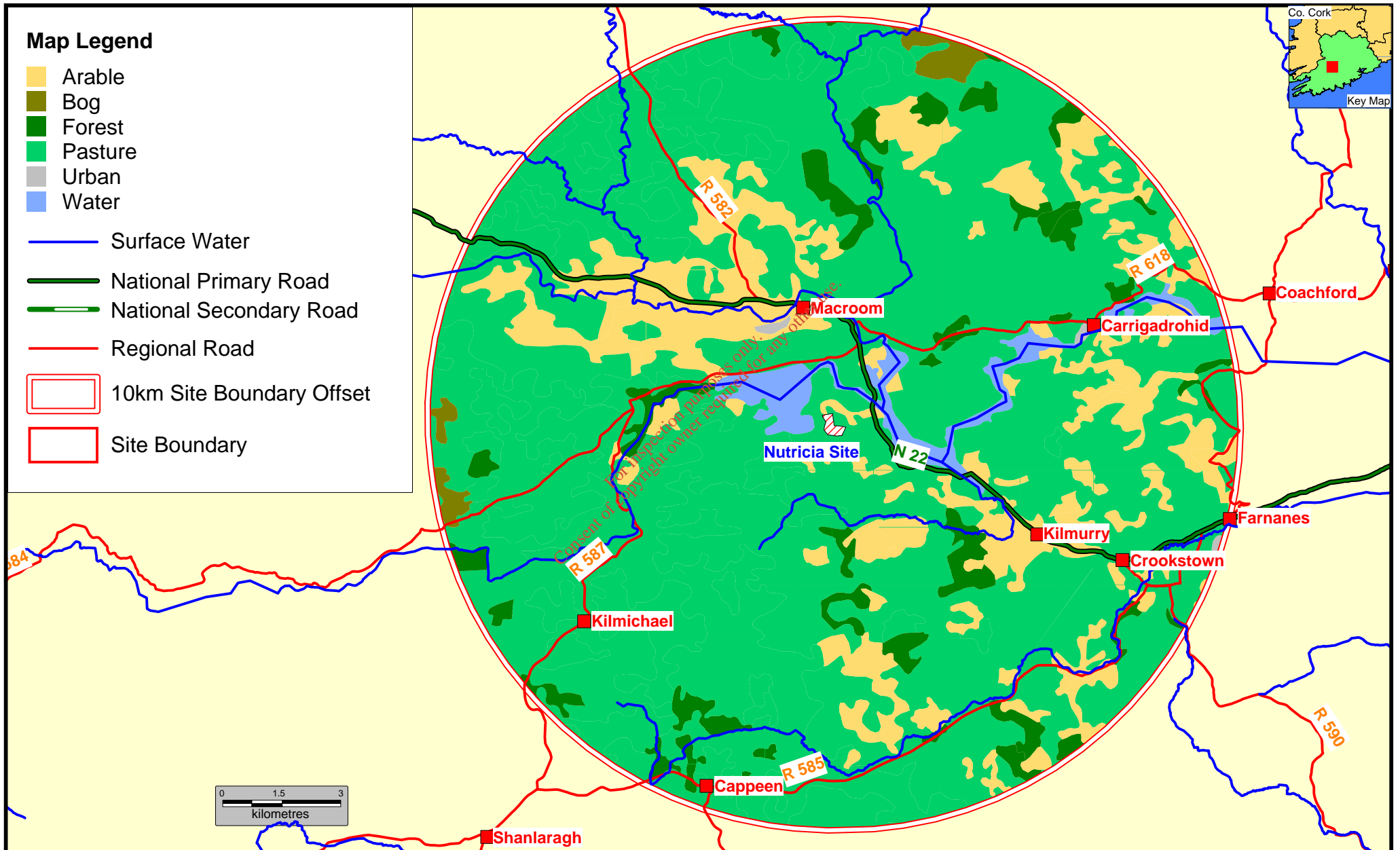
### **10.4. Mitigation Measures for Land use**

Good house-keeping practices and the application of Best Available Techniques (BAT) will ensure that potential impacts for noise, air and water emissions will not be significant on the surrounding environment.

The site has been in operation since 1979 and has not impacted on the tourist and recreational potential for the surrounding area, in particular the Gearagh.

Existing mature vegetation along the local road and along all four boundaries of the site will be left in-situ as part of the development, except for the construction of a new site entrance as required by Cork County Council.





## 10.5. Conclusions on Land Use

The land uses within the site are dominated by buildings and activities associated with processes, with 6 ha being used for grazing. The latter will not be affected by the proposed extension.

Within a 1 km radius the predominant land use is agriculture with a mix of pasture and arable farming. There are also significant tourist and recreational fishing amenities associated with the nearby Gearagh.

The existing facility has been in operation for over 27 years in the locality. As the proposed extension is within the existing site boundary there will be no significant impacts on the surrounding land use.

*For inspection purposes only.  
Consent of copyright owner required for any other use.*

---

## 11. MATERIAL ASSESTS

---

### 11.1. Introduction

This chapter describes the material assets both within the site and in the area around the proposed development. It also examines the associated impacts and where applicable, proposes mitigation measures to minimise these impacts.

### 11.2. Material Assets in the Existing Environment

The principal material assets that have been identified within or adjacent to the proposed site are:

- Road infrastructure
- Nearby residential houses
- Local employment and economic benefit
- Amenity/Tourism

### 11.3. Potential Impacts on Material Assets

#### *Road Infrastructure*

The site is approximately 1 km from the National Primary Route the N22. Macroom Town is located approximately 3.5 km to the north of the site.

The site is served by a local road the L3422. This minor road links up with the National Primary Road N22 to the east of the site and with another minor road, the L3420 to the west of the site. The current facility generates an average of 95 truck movements to and from the site each day.

There will be an increase in local traffic both during the construction phase and the operational phase of the development. The likely increase in traffic and the likely impact of such traffic on the capacity and operation of the receiving roads network will not be significant.

#### *Nearby Residential Houses*

The facility has been in operation since 1979. Since then, a number of residential dwellings have been constructed in the vicinity of the site.

Potential impacts on residential property in the immediate environs of the facility arise principally from a combination of visual, air, noise and traffic effects. As part of this application for the extension of the facility a number of existing operations are being upgraded to minimise emission levels in accordance with best practice.

These include, installing noise barriers around noise sources, upgrading of air cleaning technology and the on-site wastewater treatment plant. Odour abatement measures have also been recommended for the proposed wastewater treatment plant to minimise odour emissions to the local environment. These issues have been discussed in detail within individual sections of this EIS and mitigation measures have been proposed to minimise potential impacts.

Consequently there will be no significant adverse environmental impacts from this development on nearby residents.

#### *Local Employment and Economic Benefit*

The site at present employs 69 staff over 48 weeks of the year. On completion of the extension of the facility there will be a need for 100 staff over a full 52 week year. This will provide extra work and better job security for existing staff as well as creating new job opportunities.

In addition, the whole milk which is delivered to the facility is sourced from some 500 farms within a 20 km radius of the site. The proposed extension to the facility will increase the demand for whole milk from 14.9 million gallons per annum to approximately 41 million gallons per annum. The increase in demand for whole milk will provide indirect employment for farmers in the local area.

#### *Amenity/Tourism*

The site is located adjacent to the Gearagh which is managed by the National Parks and Wildlife Service and is owned by the ESB. The Gearagh is a national nature reserve, a biogenetic reserve, a Ramsar site and a cSAC. The reservoir is also a Wildfowl Sanctuary.

The site is used for a number of recreational activities including fishing, bird watching as well as having a number of designated walks.

Macroom is an attractive town set in the Lee Valley with historic attractions such as the Castle Demesne. The immediate surrounds of the town are excellent for walking and activities such as golfing.

Potential impacts on tourism from the proposed extension include:

- Noise
- Increased HGV traffic
- Air emissions

Potential air and noise emissions have been addressed in Section 3 and 4 of the EIS. A number of mitigation measures have been proposed including the upgrading of existing air abatement equipment.

The proposed extension will result in an increase in HGV traffic along the local roads to the site. The movements of these HGV's to and from the site will be restricted where possible, to between 07:00 – 19:00.

#### **11.4. Material Assets Mitigation Measures**

Having regard to the potential impacts outlined above, no further mitigation measures are required for the site, over and above those presented within applicable sections of this EIS.

#### **11.5. Conclusions – Material Assets**

The facility has been in operation at the existing site since 1979. The extension of the facility will be within the existing site boundary. Although the facility is adjacent to the Gearagh, the impact on this environment will mainly be restricted to visual. In addition, the proposed development will have a positive impact for the local economy in terms of direct employment and income for some 500 farms with 20 km of the site.

*For inspection purposes only.  
Consent of copyright owner required for any other use.*

---

## 12.INTERACTIONS OF FOREGOINGS

---

### 12.1. Cumulative Effects

The extension of the existing Nutricia facility, at Inchinashingane, Macroom, Co. Cork will have positive and negative impacts on the receiving environment.

#### *Potential Negative Effects*

- Short-term increase in noise levels during construction
- Potential for a decrease in air quality, due to odour, dust, etc, if the facility is not operated in accordance with best practice
- Increase in traffic levels in the surrounding area
- Visual impact of traffic movements and some site buildings and structures.

#### *Potential Positive Effects*

- The increase in production of baby food to meet the market demands in both Ireland and across Europe. This will have financial benefits for the national economy
- The provision of possible local employment
- The upgrading of existing environmental controls to minimise emissions from the existing site and the proposed extension.

### 12.2. Interaction of Effects

There is potential for interactions between one aspect of the environment and another which can result in an impact being positive, negative or neutralised. Table 12.1 outlines the interaction between the various positive and negative effects listed in Section 12.1 and how the interaction of these can result in a neutral impact.

**Table 12.1: Summary of Interaction of Environmental Effects**

Cause	Effect							
	Socio-economic	Cultural Heritage	Air Quality	Climate	Landscape	Ecology	Water Quality	Roads
Extension of facility	P	N	N	N	Neg in places	N	P	N - Neg
Noise	N	-	-	-	-	N	-	-
Dust	N	-	N	N	-	N	-	-
Odour	N	-	N	-	-	-	-	-
Traffic	Neg	-	-	-	N	N	-	N
Water quality	N	-	-	-	-	N - P	-	-
Soil	-	-	-	-	-	-	N	-

N = Neutral  
P= Positive  
Neg = Negative

### 12.3. Conclusions on the Interaction of the Foregoing

The proposed extension to the Nutricia facility at Inchinashingane, Macroom, Co. Cork will allow an increase in milk processing and baby powder production rates. The proposed extension will also create a further 31 jobs.

The previous sections of the EIS deal with any potential impacts that may occur as a result of the proposed development. Where these impacts could be negative, specific mitigation measures are put forward to minimise or neutralise these impacts on the receiving environment, where possible. It is not expected that there will be any significant impact from the interactions as a result of the proposed extension to the Nutricia facility.

---

## BIBLIOGRAPHY

---

- Asher J., Warren M., Fox R., Harding P., Jeffcoate G. & Jeffcoate S. 2001. *The Millennium Atlas of Butterflies in Britain and Ireland*. Oxford University Press, UK
- Bang, P. & Dahlstrom, P. 2004. *Animal Tracks and Signs*. Oxford University Press, Oxford.
- Bibby, C. J., Burgess, N. D., Hill, D. A. & Mustoe, S. H. 2000. Bird census techniques (second edition). Academic Press, London.
- Blake, D., Hutson, AM, Racey, PA, Rydell, J. and Speakman, JR. 1994. Use of lamplit roads by foraging bats in southern England. *J. Zool.* 234(3): 453-462.
- Blamey M, Fitter R. & Fitter A. 2003. *Wild Flowers of Britain & Ireland*. A & C Black, UK.
- California Energy Commission. 1995. *Avian collision and electrocution: an annotated bibliography*. Internet edition. California Energy Commission, Sacramento.
- Clark, M. 1990. *Badgers*. Whittet Books, London.
- Curtis T.G.F. & McGough H.N. 1988. *The Irish Red Data Book 1 Vascular Plants*. The Digest, UK.
- D'Arcy, G. 1988. *The Animals of Ireland: Pocket Guide*. Appletree Press, Belfast.
- Department of the Marine and Natural Resources. 1998. *Fisheries Guidelines for Local Authority Works*. Department of the Marine and Natural Resources, Dublin.
- Fossitt J.A. 2000. *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.
- Gibbons D.W., Reid J.B. & Chapman R.A. 1993. *The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991*. T. & A.D. Poyser Ltd., UK.
- Hayden, T. and Harrington, R. 2000. *Exploring Irish Mammals*. NPWS, Dublin.
- Institute of Environmental Assessment. 1995. *Guidelines for Baseline Ecological Ireland*. Macmillan Publishers Ltd., Oxford.
- JNCC 2004. *Common Standards Monitoring Guidance for Mammals*. JNCC, ISSN 1743-8160 (online).
- Jonsson, L. 1996. *Birds of Europe*. A&C Black, London.
- Lack P. 1986. *The Atlas of Wintering Birds in Britain and Ireland*. T. & A.D. Poyser Ltd., London.



- Lawrence, M.J. & Brown, R.W. 1973. *Mammals of Britain: Their tracks, trails and signs*. Blandford Press, Dorset.
- Morris P. & Therivel R. 1995. *Methods of Environmental Impact Assessment*. UCL Assessment. Taylor & Francis, London.
- Negro, J.J. & Ferrer, M. 1995. Mitigating measures to reduce electrocution of birds on power lines: a comment on Bevanger's review. *Ibis* 137: 423-424.
- Newton, S., Donaghy A., Allen, D. & Gibbons, D. 1999. Birds of Conservation Concern in Ireland. *Irish Birds*, 6: 333-342.
- NRA (2004). *Guidelines for the treatment of badgers prior to the construction of national road schemes*.  
[www.nra.ie/publicationsresources/downloadabledocumentation/environment/file,1489\\_en.pdf](http://www.nra.ie/publicationsresources/downloadabledocumentation/environment/file,1489_en.pdf)
- Phillips R. 1994 (2<sup>nd</sup> Ed.). *Grasses, Ferns, Mosses & Lichens of Great Britain and Ireland*. Macmillan Publishers Ltd., Oxford.
- Reader's Digest. 2004 (reprint). *Field Guide to the Trees and Shrubs of Britain*. Readers Digest, UK.
- Reader's Digest. 2004 (reprint). *Field Guide to the Wild Flowers of Britain*. Readers Digest, UK.
- Roche, N., Catto, C., Langton, S. Aughney, T., & Russ, J. 2005. *Development of a car-based bat monitoring protocol for the Republic of Ireland*. Irish Wildlife Manuals no. 19. NPWS, Dublin.
- Sargent, G. & Morris, P. 2003. *How to find and identify mammals*. The Mammal Society, London.
- Smal. C. 1995. *The Badger and Habitat Survey of Ireland*. Government Publications Office, Dublin.
- Sutherland W.J (Ed.). 2006 (2<sup>nd</sup> Edition). *Ecological census techniques, a handbook*. Cambridge University Press, UK.
- Tupinier, Y. 1997. *European Bats: Their World of Sound*. Editions Sittelle, Mens.
- The Heritage Council. 2005. *Habitat survey guidelines. A standard methodology for habitat survey and mapping in Ireland*. Draft No. 2. The Heritage Council, Kilkenny.
- Whilde A. 1993. *Threatened mammals, birds and fish in Ireland*. Irish Red Data Book 2: Vertebrates. Belfast: HMSO.