



Monaghan County Council

Comhairle Chontae an Mhuineacháin

CASTLEBLAYNEY WASTEWATER TREATMENT WORKS

ENVIRONMENTAL IMPACT STATEMENT



February 2010

Lead Consultant



Nicholas O'Dwyer
CONSULTING ENGINEERS

Sub-consultant

Entec

MONAGHAN COUNTY COUNCIL

CASTLEBLAYNEY WASTEWATER TREATMENT WORKS

ENVIRONMENTAL IMPACT STATEMENT

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

Nicholas O'Dwyer Ltd.,
Consulting Engineers,
Nutgrove Office Park,
Nutgrove Avenue,
Dublin 14.

Sub-consultant: Entec

February 2010

PROJECT NO. 20384		Prepared by		Approved by		Issued by	
		Initials	Date	Initials	Date	Initials	Date
Revision	Reason for Revision	F.L.	18/12/08	G.M.	18/12/08	J.P.	18/12/08
A	Updated following public open day	F.L.	25/03/09	G.M.	25/03/09	J.P.	25/03/09
B	Updated for Surface Water Regulations	F.L.	26/02/10	G.M.	26/02/10	J.P.	26/02/10
C							
D							

Report for

Monaghan County Council
Council Offices
The Glen
Monaghan
Republic of Ireland

Wastewater Treatment Works at Castleblayney, County Monaghan

Main Contributors

Joanna Berlyn
Darren Hall
Emma Marsden
Ruth Jones
Neil Parnell
Rachel Sampson
Adrian Simms
Christina Wadley
Paul Williamson

February 2010

Issued by

Emma Marsden
.....

Approved by

Paul Salmon
.....

Entec UK Limited

Regus Business Centre
Princes Exchange
Princes Square
Leeds LS1 4BY
England
Tel: +44 (0) 113 280 6382
Fax: +44 (0) 113 280 5973

Doc Reg No.

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

Disclaimer

This report has been prepared in a working draft form and has not been finalised or formally reviewed. As such it should be taken as an indication only of the material and conclusions that will form the final report. Any calculations or findings presented here may be changed or altered and should not be taken to reflect Entec's opinions or conclusions.

Copyright and Non-Disclosure Notice

The contents and layout of this report are subject to copyright owned by Entec (© Entec UK Limited 2008) save to the extent that copyright has been legally assigned by us to another party or is used by Entec under licence. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report.

The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Entec. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third Party Disclaimer set out below.

Third Party Disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Entec at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Entec excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

Consent of copyright owner required for any other use.

Document Amendment Record

Client:	Monaghan County Council
Project:	19925
Title:	Wastewater Treatment Works at Castleblayney, County Monaghan – Environmental Impact Statement

PROJECT NUMBER: 19925			DOCUMENT REF:		
D					
C					
B	Final Draft	EM	PS		
A	First Draft	EL	PS		
Revision	Purpose / Description	Originated	Checked	Authorised	Date
		NICHOLAS O'DWYER and ENTEC			

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

Non-Technical Summary

Introduction

An Environmental Impact Assessment (EIA) has been carried out to ascertain the significant environmental effects arising from construction and operation of the Castleblayney Wastewater Treatment Works (WwTW) capacity upgrade.

The WwTW serving Castleblayney Town is owned and operated by Monaghan County Council. It provides secondary treatment in the form of an extended aeration activated sludge plant. The final effluent discharges into a river (on the west branch of the River Fane) to the northeast of the WwTW site and in turn the main waterbody of Lough Muckno to the east.

Project Context

The WwTW serving Castleblayney Town was constructed in the 1980s and has been operating for approximately 20 years. Being approximately 20 years old, the existing secondary treatment system now needs to be overhauled. In addition, tertiary treatment facilities need to be provided and the storm water management system improved. Stage 1 of the capacity upgrade will increase its capacity to 14,000 p.e. (population equivalent¹) in order to cope with these immediate needs and ensure the continued protection of Lough Muckno.

In future years, as development takes place in Castleblayney Town, the existing secondary treatment system will not be able to cope with an increase in influent flows. Thus additional capacity is required to ensure the water quality and ecological interests of Lough Muckno are adequately protected. Stage 2 of the capacity upgrade will increase capacity to 28,000 p.e. to cope with the future development of Castleblayney Town. If this increased capacity is not provided, then the development of Castleblayney Town will be constrained in future years.

Since an extension to the existing WwTW is considered the optimum solution no alternative sites have been considered. In terms of the secondary treatment process both a conventional activated sludge plant and a sequencing batch reactor are considered viable process options. However for the purpose of this EIS a conventional activated sludge plant plus tertiary treatment has been assessed as the worst-case option.

Proposed Development

The design philosophy for the Stage 1 capacity upgrade to 14,000 p.e. is to overhaul the existing secondary treatment plant, in particular the existing mechanical and electrical equipment, in order to maximise the efficiency of the existing tanks and process units. One additional storm tank, tertiary treatment units, a picket fence thickener and a new sludge dewatering building will be installed.

The Stage 2 capacity upgrade will involve an expansion of the existing activated sludge plant to include one additional storm tank, two aeration tanks, two settlement tanks and tertiary treatment units. These structures will be similar in scale to the existing tanks and process units.

¹ Population equivalent is a standard term used to describe the size of a WwTW and may not reflect the actual size of the community associated with the discharge as it also includes commercial and industrial effluents.

The wastes that will be generated from the WwTW process are screenings, grit and dewatered sludge.

The design parameters for the Castleblayney WwTW capacity upgrade have been determined but the detailed design has yet to be finalised. The final detailed design for the project will be developed once the scheme has been granted planning approval. In those cases where assumptions have had to be made, due to the final detailed design not being available at this stage, the EIS has considered the worst case scenario and/or has specified design limits on emissions necessary to meet environmental standards.

These specified design limits will be incorporated into the Contract Documents for the construction of the WwTW capacity upgrade in terms of design envelopes. These design envelopes will clearly define the range of environmental effects and emissions that will be permitted, and each submitted proposal will be robustly examined to ensure strict adherence with these design envelopes. No transgressions from these envelopes whatsoever will be permitted in the finally accepted proposal. In summary any treatment process offered by the Contractor will be considered appropriate provided:

- i) Its effects are equal to the effects outlined in this EIS; and/or
- ii) Its positive effects are of greater significance than those outlined in this EIS; and/or
- iii) Its negative effects are of lesser significance than those outlined in this EIS.

Scoping and Consultation

A scoping report was produced to assist Monaghan County Council in determining the full range of significant environmental effects that might arise from the proposed development. It was also used to facilitate consultation with consultees that may be unfamiliar with the development proposals. Comments on the Scoping Report have been addressed within the EIS as appropriate.

Significant Residual Effects

Air Quality, Dust and Odour

Existing odour emissions from the WwTW were determined by an odour survey which was undertaken on the 25 October 2007. Modelling of odour emissions from the existing WwTW identified that odour levels at discrete receptors are consistently above both the 5 ou_E m⁻³ significance criteria.

Modelling of the WwTW capacity upgrade has shown that in order to meet the significance criterion of 5 ou_E m⁻³ a single odour control unit comprising a three stage wet chemical scrubber plus carbon with a stack height of 20m situated in the centre of the site will be required. To this all sources except the four settlement tanks will be extracted. The settlement tanks will be chemically dosed to reduce odour emissions. It is possible that the settlement tanks will also need to be extracted to the odour control unit to achieve boundary odour conditions.

No significant effects are anticipated with respect to air quality or dust.

Noise and Vibration

In order to characterise the existing noise environment, a noise survey was undertaken on 27 September 2007 at sensitive receptors in the vicinity of the WwTW site. The existing local noise sources include road traffic noise from local roads and noise associated with the WwTW itself.

Predicted construction noise levels will be in compliance with relevant guidelines whilst an Environmental Noise Criterion has been developed to ensure that, once the WwTW capacity upgrade is fully operational, noise levels at sensitive receptors do not exceed relevant guidelines.

Socio-economics

Development of Castleblayney Town is set to take place based on its key assets; namely its strategic location on a national road corridor and its potential for tourism based on recreation in and around Lough Muckno. The WwTW capacity upgrade will enable future residential and commercial development to take place without compromising the water quality and ecological interests of Lough Muckno.

Landscape and Visual

The WwTW capacity upgrade will result in the loss of a mix of vegetation types, including trees and hedgerows, across the development site. However whilst the loss of vegetation and the addition of new treatment infrastructure will increase the influence of the industrial built form on the landscape character it is not introducing a different land use to it. Thus the overall effect of the development on the landscape is not considered significant.

Effects on visual amenity during the operational stage are associated with the introduction of new treatment infrastructure, including vertical elements that will break the amenity tree dominated skyline.

Those most affected will be visual receptors situated along Muckno Street, in particular those immediately adjacent to the entrance to the proposed access road and those located on the east side of Muckno Street immediately to the west of the development site. The majority of these views will be filtered by existing vegetation intercepting views and effects are therefore of minor significance.

Water Environment

The existing WwTW outfall discharges treated effluent into a river (on the west branch of the River Fane) to the northeast of the WwTW site and in turn the main waterbody of Lough Muckno to the east. Lough Muckno outflows to the Clarebane River and the main channel of the River Fane via Lough Ross.

The final effluent will be treated to meet effluent standards which reflect the relevant statutory regulations and provide adequate protection of aquatic receptors given the assimilative capacity of the River Fane thus no significant effects are anticipated.

Ecology

The main effect on terrestrial habitats will be the permanent loss of approximately 0.04ha of amenity grassland within the existing WwTW site and 0.43ha of poor semi-improved grassland on the extension site. Broad-leaved planted trees (covering approximately 0.02ha in area) will also require felling to accommodate the WwTW capacity upgrade. These trees are considered to be of less than local value and thus their loss is not considered significant. However, they do offer suitable habitat for nesting birds and potential roost sites for bats and so compensation

planting of a ratio of 2:1 of native broad-leaved deciduous trees will be undertaken to ensure that there is no net loss of this habitat.

Traffic

The existing WwTW is located on the northeast edge of Castleblayney Town and is currently accessed via an unclassified lane that connects with the R181 (Muckno Street) as it runs through Castleblayney Town. The unclassified lane also provides access to a cattle market. Following construction of the proposed access road directly off the R181 WwTW traffic will no longer utilise this entrance. No significant effects on drivers or pedestrians are anticipated during the construction phase.

Cultural Heritage

From a review of historic Ordnance Survey maps there is a clear potential for remains associated with a 19th century tannery to exist within the development site. These remains would be subsurface features possibly taking the form of foundations or drainage channels leading to Lough Muckno. Due to the possibility of remains being encountered a watching brief during the initial soil stripping will be put in place in order to identify and record any features of cultural heritage interest.

Land Quality

A review of historical maps highlighted that there could be potential for infrastructure associated with a tannery to extend onto the WwTW site. Given that earthworks could open up a pathway between any contamination present and human receptors the Contractor will be required to provide construction workers with the correct Personal Protective Equipment and implement a dust management plan to ensure no significant effects arise.

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

Contents

1.	Background to the Project	1
1.1	Introduction	1
1.2	Environmental Impact Statement	1
1.3	Castleblayney WwTW Capacity Upgrade	1
1.4	Regulatory Context	2
1.4.1	Environmental Impact Assessment	2
1.5	Environmental Impact Assessment Process	3
1.5.1	Environmental Impact Assessment	3
1.5.2	Methodology and Structure	4
1.5.3	Temporal Scope	6
1.5.4	Spatial Scope	6
1.5.5	Limitations of the EIA Process	7
1.6	EIS Terminology	7
2.	Project Context	8
2.1	Need for the WwTW Capacity Upgrade	8
2.2	Alternatives Considered	9
2.2.1	Alternative Sites	9
2.2.2	Alternative Wastewater Treatment Designs and Processes	9
2.3	Planning Context	10
2.3.1	Introduction	10
2.3.2	National Planning Framework	10
2.3.3	Regional Planning Guidelines	10
2.3.4	County Monaghan Development Plan	11
2.3.5	Castleblayney Town Development Plan	12
2.3.6	Planning Summary	13
3.	Description of the Proposed Development	14
3.1	Site Description and Environs	14
3.1.1	Existing Wastewater Treatment	14
3.1.2	Wastewater Treatment Works Capacity Upgrade	15
3.2	Construction	16
3.2.1	Timing of Construction Works	16
3.2.2	Construction Activities	17
3.2.3	Construction Traffic	17
3.3	Operational Details	18
4.	Scoping Report	19

4.1	Scoping Process	19
4.2	Scoping Report	19
4.3	Consultation on the Scoping Report	19
4.4	Public Consultation	21
5.	Air Quality, Dust and Odour	23
5.1	Introduction	23
5.2	Scope and Methodology	24
5.2.1	Scope	24
5.2.2	Methodology	25
5.3	Existing Environment	26
5.3.1	Baseline Information Sources	26
5.3.2	Existing Situation	26
5.3.3	Predicted Trends	28
5.3.4	Information Gaps	29
5.4	Potential Effects and Incorporated Mitigation	29
5.4.1	Potential Effects during Construction and Incorporated Mitigation	29
5.4.2	Predicted Effects during Operation and Incorporated Mitigation	30
5.4.3	Implementation of Mitigation and Enhancement Measures	31
5.5	Assessment of Effects	32
5.5.1	Significance Evaluation Methodology	32
5.5.2	Predicted Effects during Construction and their Significance	32
5.5.3	Predicted Effects during Operation and their Significance	32
5.5.4	Cumulative Effects	34
5.5.5	Compensation Measures	34
5.5.6	Additional Mitigation/Enhancement Measures	34
5.5.7	Summary of Significance Evaluation	34
6.	Noise and Vibration	38
6.1	Introduction	38
6.2	Scope and Methodology	40
6.2.1	Scope	40
6.2.2	Methodology	40
6.3	Baseline Environment	40
6.3.1	Baseline Information Sources	40
6.3.2	Existing Situation	41
6.3.3	Predicted Trends	41
6.3.4	Information Gaps	41
6.4	Potential Effects and Incorporated Mitigation	42
6.4.1	Potential Effects during Construction and Incorporated Mitigation	42
6.4.2	Predicted Effects during Operation and Incorporated Mitigation	44
6.4.3	Implementation of Mitigation and Enhancement Measures	46

6.5	Assessment of Effects	47
6.5.1	Significance Evaluation Methodology	47
6.5.2	Predicted Effects during Construction and their Significance	47
6.5.3	Predicted Effects during Operation and their Significance	48
6.5.4	Cumulative Effects	48
6.5.5	Compensation Measures	48
6.5.6	Additional Mitigation/Enhancement Measures	48
6.5.7	Summary of Significance Evaluation	48
7.	Socio-economics	50
7.1	Introduction	50
7.2	Scope and Methodology	50
7.3	Scope	50
7.3.1	Methodology	50
7.4	Existing Environment	50
7.4.1	Baseline Information Sources	50
7.4.2	Existing Situation	51
7.4.3	Predicted Trends	51
7.4.4	Information Gaps	51
7.5	Potential Effects and Incorporated Mitigation	51
7.5.1	Potential Effects during Construction and Incorporated Mitigation	51
7.5.2	Predicted Effects during Operation and Incorporated Mitigation	52
7.5.3	Implementation of Mitigation and Enhancement Measures	52
7.6	Assessment of Effects	53
7.6.1	Significance Evaluation Methodology	53
7.6.2	Predicted Effects during Construction and their Significance	53
7.6.3	Predicted Effects during Operation and their Significance	53
7.6.4	Cumulative Effects	54
7.6.5	Compensation Measures	54
7.6.6	Additional Mitigation/Enhancement Measures	54
7.6.7	Summary of Significance Evaluation	54
8.	Landscape and Visual	56
8.1	Introduction	56
8.2	Scope and Methodology	56
8.2.1	Scope	56
8.2.2	Methodology	57
8.3	Existing Environment	63
8.3.1	Baseline Information Sources	63
8.3.2	Existing Situation	64
8.3.3	Predicted Trends	70
8.3.4	Information Gaps	70

8.4	Potential Effects and Incorporated Mitigation	71
8.4.1	Potential Effects during Construction and Incorporated Mitigation	71
8.4.2	Potential Effects during Operation and Incorporated Mitigation	72
8.5	Assessment of Effects	75
8.5.1	Significance Evaluation Methodology	75
8.5.2	Predicted Effects during Construction and their Significance	76
8.5.3	Predicted Effects during Operation and their Significance	78
8.5.4	Compensation Measures	80
8.5.5	Additional Mitigation/Enhancement Measures	80
8.5.6	Summary of Significance Evaluation	80
9.	Water Environment	89
9.1	Introduction	89
9.2	Scope	89
9.2.1	Scope	89
9.2.2	Methodology	90
9.3	Existing Environment	90
9.3.1	Baseline Information Sources	90
9.3.2	Existing Situation	90
9.3.3	Predicted Trends	93
9.3.4	Information Gaps	94
9.4	Potential Effects and Incorporated Mitigation	94
9.4.1	Potential Effects during Construction and Incorporated Mitigation	94
9.4.2	Predicted Effects during Operation and Incorporated Mitigation	94
9.4.3	Implementation of Mitigation and Enhancement Measures	99
9.5	Assessment of Effects	100
9.5.1	Significance Evaluation Methodology	100
9.5.2	Predicted Effects during Construction and their Significance	100
9.5.3	Predicted Effects during Operation and their Significance	100
9.5.4	Cumulative Effects	101
9.5.5	Compensation Measures	101
9.5.6	Additional Mitigation/Enhancement Measures	101
9.5.7	Summary of Significance Evaluation	101
10.	Ecology	103
10.1	Introduction	103
10.2	Scope and Methodology	103
10.2.1	Scope	103
10.2.2	Methodology	104
10.3	Baseline Environment	104
10.3.1	Baseline Information Sources - Desk Study	104
10.3.2	Baseline Information Sources - Field Survey	105

10.3.3	Existing Situation - Desk Study	106
10.3.4	Existing Situation - Field Visit	107
10.3.5	Predicted Trends	111
10.3.6	Information Gaps	111
10.4	Nature Conservation Evaluation	111
10.4.1	Policy Importance or Sensitivity	111
10.4.2	Designated Sites of Nature Conservation Interest	112
10.4.3	Habitats	112
10.4.4	Badgers	113
10.4.5	Otters	113
10.4.6	Bats	113
10.4.7	Birds	113
10.5	Potential Effects and Incorporated Mitigation	114
10.5.1	Potential Effects during Construction and Incorporated Mitigation	114
10.5.2	Predicted Effects during Operation and Incorporated Mitigation	116
10.5.3	Implementation of Mitigation and Enhancement Measures	118
10.6	Assessment of Effects	119
10.6.1	Significance Evaluation Methodology	119
10.6.2	Predicted Effects and their Significance	120
10.6.3	Cumulative Effects	121
10.6.4	Compensation Measures	121
10.6.5	Additional Mitigation/Enhancement Measures	121
10.6.6	Summary of Significance Evaluation	121
11.	Traffic	123
11.1	Introduction	123
11.2	Scope and Methodology	123
11.2.1	Scope	123
11.2.2	Methodology	125
11.3	Existing Environment	126
11.3.1	Baseline Information Sources	126
11.3.2	Existing Situation	126
11.3.3	Predicted Trends	126
11.3.4	Information Gaps	126
11.4	Potential Effects and Incorporated Mitigation	127
11.4.1	Potential Construction Effects and Mitigation	127
11.4.2	Potential Operational Effects and Mitigation	127
11.4.3	Implementation of Mitigation and Enhancement Measures	127
11.5	Assessment of Effects	127
11.5.1	Significance Evaluation Methodology	127
11.5.2	Predicted Effects during Construction and their Significance	127
11.5.3	Predicted Effects during Operation and their Significance	129
11.5.4	Cumulative Effects	129
11.5.5	Compensation Measures	129

11.5.6	Additional Mitigation/Enhancement Measures	129
11.5.7	Summary of Significance Evaluation	130
12.	Cultural Heritage	132
12.1	Introduction	132
12.2	Scope and Methodology	132
12.2.1	Scope	132
12.2.2	Methodology	133
12.3	Existing Environment	133
12.3.1	Baseline Information Sources	133
12.3.2	Existing Situation	134
12.3.3	Predicted Trends	138
12.3.4	Information Gaps	139
12.4	Potential Effects and Incorporated Mitigation	139
12.4.1	Potential Effects during Construction and Incorporated Mitigation	139
12.4.2	Predicted Effects during Operation and Incorporated Mitigation	139
12.4.3	Implementation of Mitigation and Enhancement Measures	140
12.5	Assessment of Effects	140
12.5.1	Significance Evaluation Methodology	140
12.5.2	Predicted Effects during Construction and their Significance	142
12.5.3	Predicted Effects during Operation and their Significance	142
12.5.4	Cumulative Effects	143
12.5.5	Compensation Measures	143
12.5.6	Additional Mitigation/Enhancement Measures	143
12.5.7	Summary of Significance Evaluation	143
13.	Land Quality	144
14.	Summary of Predicted Residual Effects	145
	Air Quality, Dust and Odour	145
	Noise and Vibration	145
	Socio-economics	145
	Landscape and Visual	145
	Water Environment	146
	Ecology	146
	Traffic	146
	Cultural Heritage	146
	Land Quality	146
15.	References	148

Table 1.1	Structure of this EIS	4
Table 3.1	Anticipated Construction Activities and Timings	17
Table 4.1	Summary of Responses to Scoping Report	20
Table 5.1	Existing Modelled Odour Concentrations at Discrete Receptor Locations	28
Table 5.2	Maximum Predicted Odour concentrations at Boundary for the Existing Works	28
Table 5.3	Summary of Incorporated Mitigation	31
Table 5.4	Implementation of Mitigation and Enhancement Measures	31
Table 5.5	Impact Threshold Limits for Odours	32
Table 5.5	Maximum Predicted Odour Concentrations at the Site Boundary (Scenario 1)	33
Table 5.6	The Significance of Odour Impacts for Each of the Modelled Odour Abatement Scenarios	35
Table 5.7	Effects and Evaluation of Significance	36
Table 6.1	Typical Noise Levels	38
Table 6.2	Summary of Monitored Noise Levels	41
Table 6.3	Construction Noise Predictions	43
Table 6.4	Environmental Noise Criterion (ENC)	44
Table 6.5	Summary of Incorporated Mitigation	46
Table 6.6	Implementation of Mitigation and Enhancement Measures	46
Table 6.7	Construction Noise Limits	47
Table 6.8	Effects and Evaluation of Significance	48
Table 7.1	Summary of Incorporated Mitigation	52
Table 7.2	Implementation of Incorporated Mitigation and Enhancement Measures	53
Table 7.3	Effects and Evaluation of Significance	54
Table 8.1	Magnitude of Landscape Effects	60
Table 8.2	Sensitivity of Landscape Resources	61
Table 8.3	Sensitivity of Visual Receptors	62
Table 8.4	Visual Magnitude	63
Table 8.5	Potential Landscape Receptors	68
Table 8.6	Potential Visual Receptors	69
Table 8.7	Summary of Incorporated Mitigation	74
Table 8.8	Effects on Landscape and Evaluation of Significance	80
Table 8.9	Effects on Visual Receptors and Evaluation of Significance	83
Table 9.1	Water Quality in the River Fane 2003-2005	92
Table 9.2	Flow and Load Survey Results	93
Table 9.3a	UWWTR Effluent Concentrations (Second Schedule, Part 1, S.I. 254/2001)	95
Table 9.3b	Surface Water Directive Concentrations (Schedule 3)	95
Table 9.4	Predicted in River Concentrations	97
Table 9.5	Proposed Effluent Standards	98
Table 9.7	Implementation of incorporated mitigation and enhancement measures	100
Table 9.8	Effects and Evaluation of Significance	102
Table 10.1	Evidence and Habitats Surveyed to Reveal the Presence of Protected Species	105
Table 10.2	Bat Activity Recorded	108
Table 10.3	Average emergence times of British Bats	109
Table 10.4	Definitions of nature conservation policy importance/sensitivity relevant to the proposed development at Castleblayney WwTW (adapted from IEEM 2006)	111
Table 10.5	Summary of Incorporated Mitigation	118
Table 10.6	Implementation of Mitigation and Enhancement Measures	118
Table 10.7	Impact significance table	120
Table 10.8	Effects and Evaluation of Significance	121
Table 11.1	IEEMA Guidelines: Summary of Environmental Effects	124
Table 11.2	Effects and Evaluation of Significance	130
Table 12.1	Identified Features of Cultural Heritage Interest	137
Table 12.2	Summary of Incorporated Mitigation	140
Table 12.3	Implementation of Incorporated Mitigation and Enhancement Measures	140
Table 12.4	Definition of Magnitude	141
Table 12.5	Significance Matrix	142
Table 12.6	Effects on Features of Cultural Heritage Interest and Evaluation of Significance	143
Table D.1	Monitored Existing Odour Emissions	156
Table D.2	Model Inputs for Each Scenario: Area Sources	156
Table D.3	Model Inputs Circular sources	157
Table D.4	Model Inputs Polygon area	157
Table D.5	Assessment Scenarios	157
Table D.6	Emission Parameters	158
Table D.7	Building Parameters	158
Table F.1	Odour concentrations at discrete receptor locations for existing site for each year of meteorological data	165
Table F.2	Odour concentrations at sensitive receptor locations for proposed development for each year of meteorological data	165
Table F.3	Odour concentrations at sensitive receptor locations for scenario two for each year of meteorological data	166
Table F.4	Odour concentrations at sensitive receptor locations for scenario three for each year of meteorological data	166

Table F.5	Odour concentrations at sensitive receptor locations for scenario four for each year of meteorological data	167
Table F.6	Odour concentrations at sensitive receptor locations for Scenario five- a for each year of meteorological data	167
Table F.7	Odour concentrations at sensitive receptor locations for scenario five -b for each year of meteorological data	168
Table F.8	Odour concentrations at sensitive receptor locations for scenario five c for each year of meteorological data	168
Figure 1.1	Study Area	
Figure 2.1	Castleblayney Town Development Plan	
Figure 3.1	Development Site Boundary	
Figure 3.2	Existing WwTW Layout	
Figure 3.3	Proposed WwTW Layout	
Figure 6.1	Noise Receptors	
Figure 8.1	Photo Sheets	
Figure 8.2	Study Area and Landscape Context	
Figure 8.3	Visual Envelope	
Figure 9.1	River System and Water Quality Monitoring Stations	
Figure 10.1	Designated Ecological Sites	
Figure 10.2	Phase I Habitat Survey	
Figure 10.3	Bat Activity Survey	
Figure 11.1	Accident Assessment Area	
Figure 12.1	Identified Features of Cultural Heritage Interest	
Appendix A	Noise Monitoring	
Appendix B	Scoping Responses	
Appendix C	Olfactometry and Odour Units	
Appendix D	Odour Model Inputs	
Appendix E	Schematics and Scenarios	
Appendix F	Predicted Odour Concentrations	
Appendix G	Meteorological Wind Roses	
Appendix H	Ecological Best Practice	
Appendix I	Waste Assimilative Capacity Calculations	

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

Glossary, Abbreviations & Definitions

Term	Description
Activated Sludge Plant	A form of sewage treatment in which air is forced in to sewage liquor to develop a microbiological community which reduces the organic content of the sewage.
AERMOD	Atmospheric dispersion modelling software used for air quality modelling
Aerobic	A biochemical process or condition occurring in the presence of oxygen
Algal blooms	A proliferation of microscopic algae in water bodies, stimulated by the input of nutrients, which can cause toxicity through oxygen depletion
AMD	Acid mine drainage
Anaerobic Digestion	The breaking down of organic matter in oxygen free conditions
Anoxic	A condition in which oxygen is absent
Anthropogenic	Effects or processes derived from human activities, as opposed to natural effects or processes that occur in the environment without human influences
Aquaculture	The controlled cultivation and harvest of aquatic plants or animals
Bathymetry	The measurement of ocean depths and the charting of the topography of the ocean floor
Benthos	An ecological community, comprising organisms on the bed of a water body. The community is termed a 'benthic' community. See also, Epifauna
BOD ₅	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
Compensation	Measures taken to offset/compensate for residual adverse effects that cannot be entirely mitigated. These usually take the form of replacing what will be lost.
DCMNR	Department of Communications, Marine and Natural Resources
DEHLG	Department of the Environment, Heritage and Local Government
Design envelopes	Environmental limits incorporated into the Contract Documents which will define the range of impacts and emissions that will be permitted.
Dewatering	To remove the free water from a solid substance (e.g. to reduce water content in thereby reduce the overall volume).
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
Epifauna	Animals living on the surface of the bottom of a water body (See also Benthic)
EQS	Environmental Quality Standard
Eutrophication	The process whereby a body of water becomes rich in dissolved nutrients through natural or man-made processes. This often results in a deficiency of dissolved oxygen, producing an environment that favours restricted biological communities.
Flora and Fauna	The plant and animal life
HGV	Heavy Goods Vehicle
IEMA	Institute of Environmental Management & Assessment
Infauna	Animals living within submerged sediments
JNCC	Joint Nature Conservation Committee
MRP	Molybdate Reactive Phosphate
NHA	National Heritage Area
NH ₃	Un-Ionised Ammonia

Term	Description
NH ₄ ⁺	Ammonium Ion
Nitrification	The biological oxidation of ammonium salts to nitrites and the further oxidation of nitrites to nitrates
NSS	National Spatial Strategy
NO ₂	Nitrogen Dioxide
NO ₃ ⁻	Nitrate
OU _E	European odour unit
Organic load	The total amount of organic matter to enter the treatment plant
Olfactometry	Measurement of the response of assessors to olfactory stimuli
OSPAR	The Convention for the Protection of the Marine Environment of the North-East Atlantic
p.e.	"population equivalent" is a measurement of organic biodegradable load. A population equivalent of 1 (1 p.e.) means the organic biodegradable load having a five-day biochemical oxygen demand (BOD ₅) of 60g of oxygen per day.
Q-values	A biological quality ratings for rivers and streams used by the EPA
RBD	River Basin District. "River basin district" means the area of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters, which is identified as the main unit for management of water resources under the Water Framework Directive.
Receptor	Any element in the environment which is subject to impacts
RPG	Regional Planning Guidelines
Sewerage	The system of pipes and apparatus for the collection and transportation of sewage / wastewater
TMP	Traffic Management Plan
Trophic	The position of organisms in the food chain of an ecosystem based on type of food supply required. The trophic status of a waterway refers the rate at which organic matter is supplied, with high levels of nutrients leading to algal growth and deterioration in water quality.
TSS	Total Suspended Solids
µg	Microgramme
UWWTR	Urban Wastewater Treatment Regulations, 2001 (S.I. No. 254 of 2001)
WFD	Water Framework Directive. Directive 2000/60/EC establishing a framework for Community action in the field of water policy and commonly referred to as the Water Framework Directive. The WFD is implemented in Ireland by S.I. No. 722 of 2003, the European Communities (Water Policy) Regulations 2003.
WwTW	Wastewater Treatment Works

1. Background to the Project

1.1 Introduction

1.2 Environmental Impact Statement

Environmental Impact Assessment (EIA) has been carried out to ascertain the significant environmental effects arising from construction and operation of the Castleblayney Wastewater Treatment Works (WwTW) capacity upgrade. This document is the Environmental Impact Statement (EIS) which presents the findings of the EIA process. The existing WwTW is located on the northeast edge of Castleblayney Town, adjacent to Lough Muckno as shown in **Figure 1.1**.

The EIS has been prepared by the Nicholas O'Dwyer and Entec project team.

1.3 Castleblayney WwTW Capacity Upgrade

The WwTW serving Castleblayney Town is owned and operated by Monaghan County Council. It was constructed in the 1980s and has been operating for approximately 20 years. The WwTW provides secondary treatment in the form of an extended aeration activated sludge plant with additional phosphorus reduction. The final effluent discharges into a river (on the west branch of the River Fane) to the northeast of the WwTW site and in turn the main waterbody of Lough Muckno to the east.

Being approximately 20 years old, the existing secondary treatment system now needs to be overhauled, tertiary treatment facilities need to be provided and the storm water management system improved. Stage 1 of the WwTW capacity upgrade will increase its capacity to 14,000 p.e. (population equivalent²) in order to cope with these immediate needs and ensure the continued protection of Lough Muckno.


In future years, as development takes place in Castleblayney Town, the existing secondary treatment system will not be able to cope with an increase in influent flows. Thus additional capacity is required to ensure the water quality and ecological interests of Lough Muckno are adequately protected. Stage 2 of the WwTW capacity upgrade will increase capacity to 28,000 p.e. to cope with the future development of Castleblayney Town. If this increased capacity is not provided, then the development of Castleblayney Town will be constrained in future years.

² Population equivalent is a standard term used to describe the size of a WwTW and may not reflect the actual size of the community associated with the discharge as it also includes commercial and industrial effluents arriving at the WwTW for treatment.



Key

 Site boundary

0 m  500 m
Scale 1:10,000 @ A3

Entec and O'Dwyer

Nutgrove Office Park
Nutgrove Avenue
Dublin 14

Castleblayney WwTW
Environmental Impact Statement

Figure 1.1
Study Area

February 2008
19925-R13.dwg marsa01

Entec

1.4 Regulatory Context

1.4.1 Environmental Impact Assessment

This EIA has been carried out in accordance with the requirements of the Local Government (Planning and Development) Regulations 2001³ (the Planning Regulations) and the European Communities (Environmental Impact Assessment) Regulations 1989 to 2006,⁴ herein referred to as the EIA Regulations. Schedule 5, Part 2 of the Planning Regulations determine the necessity for EIA to be undertaken in relation to extended wastewater treatment plants as follows:

13. Changes, extensions, development and testing

(a) Any change or extension of development which would:-

(i) result in the development being of a class listed in Part 1 or paragraphs 1 to 12 of Part 2 of this Schedule, and

(ii) result in an increase in size greater than –

- 25 per cent, or

- an amount equal to 50 per cent of the appropriate threshold,

whichever is the greater.

Part 2 of the Schedule referred to in (i) above includes:

11. Other projects

(c) Wastewater treatment plants with a capacity greater than 10,000 population equivalent as defined in Article 2, point (6), of Directive 91/271/EEC not included in Part 1 of this Schedule

The Castleblayney WwTW capacity upgrade exceeds the threshold criteria for the provision of an EIS as set out within of the Planning Regulations by (i) having a capacity of greater than 10,000 p.e. and (ii) resulting in an increase in capacity of greater than 25 per cent.

In addition, when determining the need for EIA, account must be taken, *inter alia*, of the sensitivity of the environment⁵. An EIA screening report⁶ demonstrated a source-pathway-receptor linkage from the WwTW to Lough Muckno (a proposed Natural Heritage Area) and that residential and commercial properties existed within 100m of the site. Taking the sensitivity of Lough Muckno and local properties into consideration it was determined that an EIS should be prepared in relation to the WwTW capacity upgrade.⁷

³ S.I. No. 600 of 2001

⁴ S.I. No. 349 of 1989; S.I. No. 84 of 1994; S.I. No. 101 of 1996; S.I. No. 351 of 1998; S.I. No. 92 of 1999; S.I. No. 93 of 1999; S.I. No. 538 of 2001; and S.I. No. 659 of 2006

⁵ Schedule 7 of S.I. No. 600 of 2001

⁶ Nicholas O'Dwyer and Entec, May 2007, Castleblayney Sewerage Scheme: Environmental Impact Statement – Screening Report.

⁷ The Castleblayney EIS Screening Report (NOD and Entec, 2007) was produced on the basis of the WwTW being upgraded to 14,000 p.e. (Stage 1) within the existing boundaries of the WwTW site. The subsequent Scoping Report considered upgrading the WwTW to 28,000 p.e. (Stage 2) with additional land take required to the east of the existing WwTW site. In producing the Scoping Report, the potential impacts previously identified in the EIS Screening Report were reviewed in light of these changes to the characteristics and location of the development.

1.5 Environmental Impact Assessment Process

1.5.1 Environmental Impact Assessment

Environmental Impact Assessment (EIA) is a process by which information about the environmental effects of a project is collected, evaluated and presented in a form that provides a basis for consultation. Decision-makers can then take account of these environmental effects when determining whether or not a project should be granted planning approval.

The results of the EIA process are reported in an Environmental Impact Statement (EIS) that accompanies the application for planning permission. The EIS is made available to consultees through the statutory consultation process associated with the granting of planning permission.

The EIA process has a number of key characteristics:

- i) It is systematic, comprising a sequence of tasks defined both by regulation and by practice;
- ii) It is analytical, requiring the application of specialist skills from the environmental sciences;
- iii) It is impartial, its aim being to inform the decision-makers;
- iv) It is consultative, with provision being made for obtaining feedback from interested parties, including local authorities and statutory agencies; and
- v) It is interactive, allowing opportunities for environmental concerns to be addressed during the planning, design and implementation of a project.

A significant part of the EIA process involves identifying ways in which environmental effects can be reduced or mitigated and, where it is not possible to fully to achieve this, means of compensating for the environmental effects. In certain circumstances a particular development may result in an improvement in the local environment, referred to as enhancement. The terms mitigation, compensation and enhancement, as defined in Box 1.1, are adopted within this EIS to describe the environmental effects of the proposed development.

Box 1.1	Definitions of mitigation/compensation/enhancement
Mitigation:	
Avoidance: Measures taken to avoid adverse environmental effects.	
Reduction: Measures taken to reduce adverse environmental effects.	
Compensation:	
Measures taken to offset or compensate for residual adverse effects that cannot be entirely mitigated. These measures usually take the form of replacing what will be lost.	
Enhancement:	
The genuine enhancement of environmental interest.	

1.5.2 Methodology and Structure

The content of the EIS is in accordance with the Planning Regulations and is structured as per **Table 1.1** using the grouped format structure identified in the Environmental Protection Agency’s (EPA) guidelines (EPA, 2002).

Table 1.1 Structure of this EIS

Section	Contents
	A non-technical summary of the EIS
1	Background to the project and the EIA process
2	Project context (including the regulatory and national and local planning policy context)
3	Description of the proposed development (including infrastructure, processes and a discussion of the alternatives considered)
4	Explanation of, and results of, the scoping exercise
Technical Assessments	
5	An assessment in relation to air quality and odour
6	An assessment in relation to noise and vibration
7	An assessment in relation to socio-economics
8	An assessment in relation to landscape and visual
9	An assessment in relation to the water environment
10	An assessment in relation to ecology
11	An assessment in relation to traffic
12	An assessment in relation to cultural heritage
13	An assessment in relation to land quality
14	Summary of significant residual effects

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

Structure of this EIS

Each of the technical assessment chapters follows the following format:

- a) description of the existing environmental conditions;
 - b) identification of the potential environmental effects of the Castleblayney WwTW capacity upgrade and identification of the incorporated mitigation measures to reduce effects; and
 - c) an assessment of the environmental effects of the scheme following incorporation of the identified mitigation measures.
-

The assessment has been based on a thorough understanding of the proposed development with each of the environmental topics being assessed against existing baseline data. Different methodologies have been utilised to assess the adverse and beneficial environmental effects relating to each of the topics that are investigated as part of the EIA. For each of the environmental topics being assessed, the temporary effects, mainly during construction, and the long-term effects of operation of the WwTW capacity upgrade have been separately assessed. The EIA has taken account of direct, indirect, short term, long term, secondary and cumulative effects.

The significance of environmental effects has been evaluated using a matrix approach, taking account of the type of environmental effect, its magnitude, the probability of its occurrence and the policy importance or sensitivity of receptors, using standard criteria as outlined in each topic subsection.

The magnitude of the consequence refers to the degree or extent of change, defined where possible in quantifiable terms. The different dimensions of magnitude might include variables such as, the area of a particular resource or number of receptors that are affected, or the duration, frequency or extent of a consequence. Examples might include the area of land-take, the increase in noise levels or the extent or visibility of new infrastructure. Resource value is determined by reference to criteria such as rarity or sensitivity or to a geographical hierarchy of designations. For example, Special Areas of Conservation are of international wildlife conservation value whilst Natural Heritage Areas are of national importance. Receptor sensitivity is related to the type of use. For example, residential dwellings are generally considered more sensitive than commercial premises; schools and hospitals are considered to be especially sensitive.

These considerations, together with any relevant environmental standards or guidelines, form the basis upon which each specialist bases their definition of significance. Individual methodologies are outlined at the start of each topic subsection of the EIS and are based upon recognised good practice. However in all cases the scale presented in **Box 1.2** is used in the assessment of significance.

Box 1.2 Assessment of significance

Major significance: an effect that is of such importance that it should be considered as a major factor that should influence whether or not the development should be allowed to proceed.

Minor significance: an effect that is not sufficiently important to influence whether or not the development should be allowed to proceed but which requires careful attention to ensure that, if adverse, it is adequately mitigated, and if beneficial, that measures are put in place to ensure that the benefits are realised.

Not significant: an effect that is of such small importance that it requires no specific attention.

Major significant effects are identified in this EIS in accordance with the Planning Regulations. The EIS also identifies environmental effects of minor and no significance, in order that consultees and decision-makers are provided with a complete picture.

If any difficulties (such as, technical deficiencies or lack of know-how) have been encountered in compiling the required information this is reported on in each topic subsection.

1.5.3 Temporal Scope

The temporal scope of the EIA covers the period from commencement of the first phase of construction through to the operational phase and, as appropriate, to a date some years after the commencement of operation. This date will vary according to the nature of the development and the environmental aspects concerned. In this case the operations will build up to a maximum WwTW capacity of 28,000 p.e. by the year 2021 although this is dependent on population growth.

Construction Phase

The EIS considers impacts during the construction phase of the proposed development. Many significant environmental effects during construction are temporary in nature and largely independent of the detailed design of the WwTW capacity upgrade, for example, pollution risk to nearby watercourses.

Operation Phase

In relation to the operational phase, the EIS addresses both static environmental effects, for example, visual effects and the effects of operational activities, particularly with respect to odour emissions, effluent discharge, noise emissions and traffic generation.

Extensions and Decommissioning

The requirement for wastewater and sludge treatment will continue for the foreseeable future thus no overall decommissioning requirement is likely to arise. The concrete components of the WwTW upgrade will be designed for a life of at least 40 years. Routine replacement and upgrading of electrical and mechanical equipment during this 40 year period is considered to be part of normal operation, these activities are unlikely to have significant effects on the environment and will therefore not require further EIA. It is unrealistic at present to predict if major upgrading will be required in the future, therefore this has not been considered within the EIS.

1.5.4 Spatial Scope

In its broadest sense, the spatial scope of the EIA is the area over which changes to the environment may occur as a consequence of the proposed development. As required by the

Planning Regulations, the EIA focuses on those areas where environmental effects have the potential to be significant.

The spatial scope varies between both environmental effects and specialist topic areas. For example, the effect of a proposed development upon the surrounding landscape is likely to require a greater spatial scope than, for example, the study of effects on soils. The spatial extent of each part of the assessment is made clear under each individual technical subsection.

1.5.5 Limitations of the EIA Process

Under Paragraph 3(g) of the second schedule of the Planning Regulations there is a legal requirement to outline any difficulties, such as technical deficiencies or lack of knowledge encountered in compiling any specified information.

The design parameters for the Castleblayney WwTW capacity upgrade have been determined but the detailed design has yet to be finalised. The final detailed design for the project will be developed once the scheme has been granted planning approval.

In those cases where assumptions have had to be made, due to the final detailed design not being available at this stage, the EIS has considered the worst case scenario and/or has specified design limits on emissions necessary to meet environmental standards. These specified design limits will be incorporated into the Contract Documents for the construction of the WwTW capacity upgrade in terms of design envelopes. These design envelopes will clearly define the range of environmental effects and emissions that will be permitted, and each submitted proposal will be robustly examined to ensure strict adherence with these design envelopes. No transgressions from these envelopes whatsoever will be permitted in the finally accepted proposal. In summary any treatment process offered by the Contractor will be considered appropriate provided:

- i) Its effects are equal to the effects outlined in this EIS; and/or
- ii) Its positive effects are of greater significance than those outlined in this EIS; and/or
- iii) Its negative effects are of lesser significance than those outlined in this EIS.

1.6 EIS Terminology

In some EIS, the terms impact and effect are used interchangeably whilst in others the terms are given different meanings. Some use 'impact' to mean the cause of an 'effect' whilst others use the converse meaning. This variety of definitions has led to a great deal of confusion over the terms impact and effect, both among the environmental specialists that undertake EIA and those who read the resulting EIS.

The convention used in this document is to use impact only within the context of the term Environmental Impact Assessment, which describes the process from scoping through EIS preparation to subsequent monitoring and other work. Otherwise, this document uses the phrase environmental effect when describing the implications of the development, covering both changes and consequences.

2. Project Context

2.1 Need for the WwTW Capacity Upgrade

The WwTW serving Castleblayney Town is owned and operated by Monaghan County Council. It was constructed in the 1980s and has been operating for approximately 20 years. The WwTW provides secondary treatment in the form of an extended aeration activated sludge plant with additional phosphorus reduction. The activated sludge plant uses biological processes to remove (mainly) organic matter from the wastewater whilst additional phosphorus reduction is applied to assist in protecting the receiving waters of Lough Muckno from nutrient enrichment. No additional tertiary treatment is currently provided. Dewatered sludge from the WwTW is stored on site and transported off site for further treatment and disposal.

The current WwTW is designed to accept both a domestic load, from residential properties, and an industrial load. However, the WwTW mainly deals with the domestic effluent stream since the industries present in the town are predominantly 'dry' and do not contribute significant loadings to the sewerage network. It has a treatment capacity of 12,960 p.e. but the current plant loading of approximately 4,000 p.e. means there is approximately 8,960 p.e. of capacity spare. The wastewater flow and load from the commercial/educational sector (shops, hotels, schools etc.) has been estimated as 14% of the total load. The wastewater flow and load from the industrial sector has been estimated as 31% of the total load.

Treated effluent discharges into the west branch of the River Fane, to the northeast of the WwTW site and in turn the main waterbody of Lough Muckno to the east. Since the WwTW was constructed in the 1980s no EIS was prepared, thus no licensed discharge limits are in place for the effluent discharge. However, the Castleblayney Catchment Report (DoEHLG, 2004) states that routine monitoring data has shown that the WwTW has consistently discharged treated effluent in compliance with the discharge standards specified in the Urban Waste Water Treatment Regulations, 2001⁸ (S.I. No 254/2001) (UWWTR). Storm water storage is limited at the WwTW and as a consequence, untreated effluent is often discharged into Lough Muckno during storm events.

Being approximately 20 years old, the existing secondary treatment system now needs to be overhauled, tertiary treatment facilities (sand filtration) need to be provided and the storm water management system improved. Stage 1 of the WwTW capacity upgrade will increase its capacity to 14,000 p.e. in order to cope with these immediate needs and ensure the continued protection of Lough Muckno.

In future years, as development takes place in Castleblayney Town, the existing secondary treatment system will not be able to cope with an increase in influent flows. Thus additional capacity is required to ensure the water quality and ecological interests of Lough Muckno are adequately protected. Stage 2 of the WwTW capacity upgrade will increase capacity to 28,000 p.e. to cope with the future development of Castleblayney Town. If this increased capacity is not provided, then the development of Castleblayney Town will be constrained in future years.

The Stage 1 and Stage 2 works will enable Castleblayney WwTW to provide modern, effective effluent treatment utilising existing tanks and process units as far as is practicable. New sludge treatment facilities will be installed to deal with the additional sludge that will be generated by

⁸ <25mg/l BOD, <35mg/l suspended solids and <2mg/l Total Phosphorus

the WwTW upgrade. In addition, a new access road will be constructed to the WwTW to provide a more suitable access route for large vehicles, such as, sludge skips.

The WwTW upgrade is part of a wider sewerage improvement programme for Castleblayney Town which will include the provision of associated pumping stations and sewerage network improvements. These other elements fall outside of the scope of any EIA, apart from consideration of their cumulative effects.

2.2 Alternatives Considered

2.2.1 Alternative Sites

The choice of site for the proposed new treatment facilities, to allow for projected expansion of Castleblayney, located within and adjacent to the existing WWTW site, will utilise the existing mains sewerage connection from Castleblayney and discharge to the existing outfall location upstream of Lough Muckno. One of the main advantages of utilising the existing infrastructure is that there will be no requirement for additional disturbance of the local population or ecological receptors due to installation of new pipelines or relocation of the outfall.

The land available at the proposed site is partially within the existing site boundary and existing emissions for odour and noise from existing operations already exist. The landscape already features similar structures to those proposed. The phase 1 development of the site will all be carried out within the existing site boundary reducing the impacts at this stage.

The above considerations identify that the existing site and the proposed extension adjacent to the existing site is likely to be a minimal environmental impact location which will utilise existing infrastructure to reduce potential environmental damage, contributing to sustainable development.

2.2.2 Alternative Wastewater Treatment Designs and Processes

Lough Muckno has been designated as a “sensitive area” under the UWWTR. Therefore preliminary treatment, storm water tanks, a form of extended aeration and tertiary treatment are required to meet the effluent standards set out in the UWWTR. Since dewatered sludge is exported from the site, the process selection also needs to take into account the need to produce a low volume of dewatered sludge (minimum dry solids content of 18%) in order to reduce transport costs. The process options that have been considered are:

- Conventional activated sludge plant plus tertiary treatment

Expansion of the existing treatment plant to include an extended aeration plant and secondary clarifiers. In addition to the existing plant, 2 No. aeration tanks and 2 No. settlement tanks similar in size to the existing process units would be required to treat 28,000 p.e.

- Sequencing Batch Reactor (SBR) activated sludge system plus tertiary treatment

Expansion of the existing treatment plant to include a SBR activated sludge system. This carries out aeration and sedimentation sequentially in the same tank. The system works through the operation in a batch mode, based on a cycle of fill, aerate, settle and decant. In addition to the existing plant, 2 No. SBR each sized for 7,000 p.e. with dimensions 24m x 12m x 5.5m and a volume of 1,840m³ would be required to treat 28,000 p.e.

For the purpose of this EIS a conventional activated sludge plant plus tertiary treatment has been taken as the worst-case option for assessment purposes. This is because it has the largest footprint of the options and the greatest potential for odour emissions. However the final site design and processes to be used will be finally determined via the Contract Documents. Design envelopes will clearly define the environmental effects and emissions that will be permitted, and each submitted proposal will be robustly examined to ensure strict adherence with these design envelopes. No transgressions from these envelopes whatsoever will be permitted in the finally accepted proposal.

2.3 Planning Context

2.3.1 Introduction

This section sets out an overview of the planning and regulatory context within which the development proposals need to be considered. A full description of the relevant national, regional and local planning policy framework are included below along with identification of relevant planning policies.

2.3.2 National Planning Framework

The Planning and Development Act 2000 consolidates all previous Planning Acts and much of the EIA Regulations. The key legislative instruments governing planning in Ireland are as follows:

- Planning and Development Act, 2000; and
- Planning and Development Regulations, 2001 (S.I. No. 600 of 2001).

National Spatial Strategy

The National Spatial Strategy for Ireland 2002-2020 (NSS) was published by the Minister for the Environment and Local Government in late 2002. The NSS is a twenty year planning framework designed to achieve a better balance of social, economic, physical development and population growth between regions. In order to drive development in the regions, the NSS requires that areas of sufficient scale and critical mass be built up through a network of gateways and hubs.

The NSS identifies Monaghan as a development ‘hub’ linked with the ‘gateway’ of Dundalk by the N2 National Primary Route between Dublin and Derry in Northern Ireland. Castleblayney is situated on this national transport corridor and the NSS states that;

“In more eastern parts of the border region, towns such as Castleblayney, Carrickmacross and Ardee can promote themselves more effectively in the context of the strength of Dundalk and Monaghan.”

The NSS also sets out a number of sustainable development principles, which include avoiding adverse impacts upon environmental features such as landscapes, habitats and protected species, river catchments, the maritime environment and cultural heritage.

2.3.3 Regional Planning Guidelines

The Border’s Regional Authority adopted Regional Planning Guidelines (RPG) for the Border Region on 24 May 2004. The RPG provides a strategic development and planning vision for the region and the framework for the delivery of that vision.

“By 2020 the Border Region will be a competitive area recognised as, and prospering from, its unique interface between two economies, where economic success will benefit all, through the building of distinct sub regional identities, in an outstanding natural environment with innovative people, which in themselves, will be our most valuable asset....”

The RPG identifies Castleblayney as a medium sized town, in need of urban strengthening and which would perform an important role in driving the development of a particular spatial component, in conjunction with Carrickmacross and Clones.

Under the Planning and Development Act 2000 local planning authorities must have regard to any regional guidelines in force for their area when making and adopting a development plan.

The role of EU projects and partnerships has and will continue to play an important role in achieving the Border region’s objectives. In recent times there has been a ‘shift in emphases’ as regards the role of such projects and partnerships. Much attention has been focused in the past on infrastructure projects including bringing waste and wastewater provision up to date. It is also clear that the Border region which Castleblayney is part of is seeking innovative ways of developing in the future.

2.3.4 County Monaghan Development Plan

The County Monaghan Development Plan (2007 – 2013) was adopted in March 2007. It covers the whole of County Monaghan and the five towns of Monaghan, Carrickmacross, Castleblayney, Ballybay and Clones and is the first plan for the County to be prepared under the Planning and Development Act 2000.

The County Monaghan Development Plan sets out an overall strategy for the sustainable development of County Monaghan. It provides a vision and outlook for the future development of the County up to 2013 with a longer term view taken beyond 2013. It consists of a written statement and maps; the latter identify land use proposals and provide clarification to the objectives contained in the written statement.

The settlement strategy identifies that Castleblayney is a Tier 3 town. Service provision in these towns often includes a range of retail and educational services, but limited financial, health and community services. The plan states that these towns should be further developed as residential and employment centres as well as service and local retail centres for their surrounding hinterland.

The strategic aims of the five local authorities in County Monaghan, of which Castleblayney is one, include:

“To support balanced economic development throughout the county by delivering improved infrastructure and services.”

Under the Local Government Act 2001, the sanitary functions of all town councils were transferred to County Councils on 1st January 2004. Monaghan County Council now maintains and operates nine water supply schemes and 29 waste water treatment plants and collection systems. Whilst all the public waste water treatment facilities in County Monaghan have secondary treatment facilities, the Urban Wastewater Treatment Regulations 2001 require specific treatment for discharges to waters for population equivalents greater than 15,000 population equivalent and also sets out specific requirements in relation to discharges to sensitive water areas for population equivalents greater than 10,000.

There are three sensitive water areas located in the county, the River Blackwater, downstream of Monaghan Town, Lough Muckno, the discharge point for Castleblayney WwTW and the

Prouleas, downstream of Carrickmacross. The plans states that additional monitoring and emission control together with additional treatment are required for the discharges from the three WwTWs serving Monaghan, Castleblayney and Carrickmacross.

Castleblayney WwTW was identified in the Water Services Investment Programme 2004 - 2006 which provides for major investment in water supply infrastructure.

For sludge management and treatment, a sludge drying unit was commissioned at Monaghan Town Sewerage Treatment Works in 2004 to treat all sludge produced in the county's water and wastewater treatment plants.

There are six policies for wastewater treatment in the County Monaghan Development Plan:

WWT1 – *‘Meet the waste-water services needs of industry and residential development in urban settlements by the provision and maintenance of wastewater treatment plants to acceptable environmental standards’*

WWT2 – *‘Meet the waste water services needs of Carrickmacross, Castleblayney and Monaghan towns by the provision and maintenance of wastewater treatment plants to the standards prescribed in the EU Urban Waste Water Treatment Directive’.*

WWT3 – *‘Facilitate the development of towns and villages throughout the county, directly or in partnership with local development, by improving and extending wastewater infrastructure’.*

WWT4 – *‘Complete the proposals outlined in the Water Services Investment Programme and Assessment of Needs Report 2005-2009, subject to funding’.*

WWT5 – *‘Ensure receiving waters have sufficient flow and capacity for the treatment and dilution of treated waste water’.*

WWT6 – *‘Development shall not normally be permitted within 100 metres of the boundary of any waste water treatment works, where that development is sensitive to smell nuisance and the amenity of it is likely to be detrimentally impacted on by the operation or expansion of the plant. Where the 100 metre cordon has already been compromised by existing or permitted smell sensitive development, the Planning Authority may look favourably on a new development which is similar to that which exists or is permitted, and where in its opinion, the amenity of the development will not be detrimentally impacted on by the plant. In exceptional circumstances, this figure may be reduced where it is proven to the satisfaction of the Planning Authority, through comprehensive smell nuisance modelling, carried out by a competent professional, that the amenity of the development will not be detrimentally impacted upon either at the time of the application or following expansion of the relevant works’.*

2.3.5 Castleblayney Town Development Plan

The Castleblayney Town Development Plan (2007 - 2013) sets out the town council's vision for the development of Castleblayney and contains objectives which it seeks to implement over the period of the plan. These objectives relate to a range of topics including roads and traffic, the provision of services, the preservation and conservation of buildings and the protection of sites of scientific, historic or cultural importance. The plan also addresses existing and future plans for the development of Castleblayney Town by means of zoning appropriate areas for residential, commercial, retail, industrial, open space and recreational development.

Castleblayney Town has been in decline for a number of years but recent development levels indicate the town has recovered and is expanding its residential, retail and commercial base. The infrastructure of the town needs to be able to cope with the expansion of the town.

Under Section 83 of the Local Government Act 2001 from the 1st January 2004 Monaghan County Council became responsible for the provision of Water Services (Water and Waste Water) throughout the county. The Castleblayney Development Plan notes that whilst sufficient capacity exists within the treatment works, the collection network is operating above design capacity and is in need of significant upgrading and extension to accommodate any new development. The Castleblayney wastewater scheme is included in the National Water Services Investment Programme 2006 - 2008.

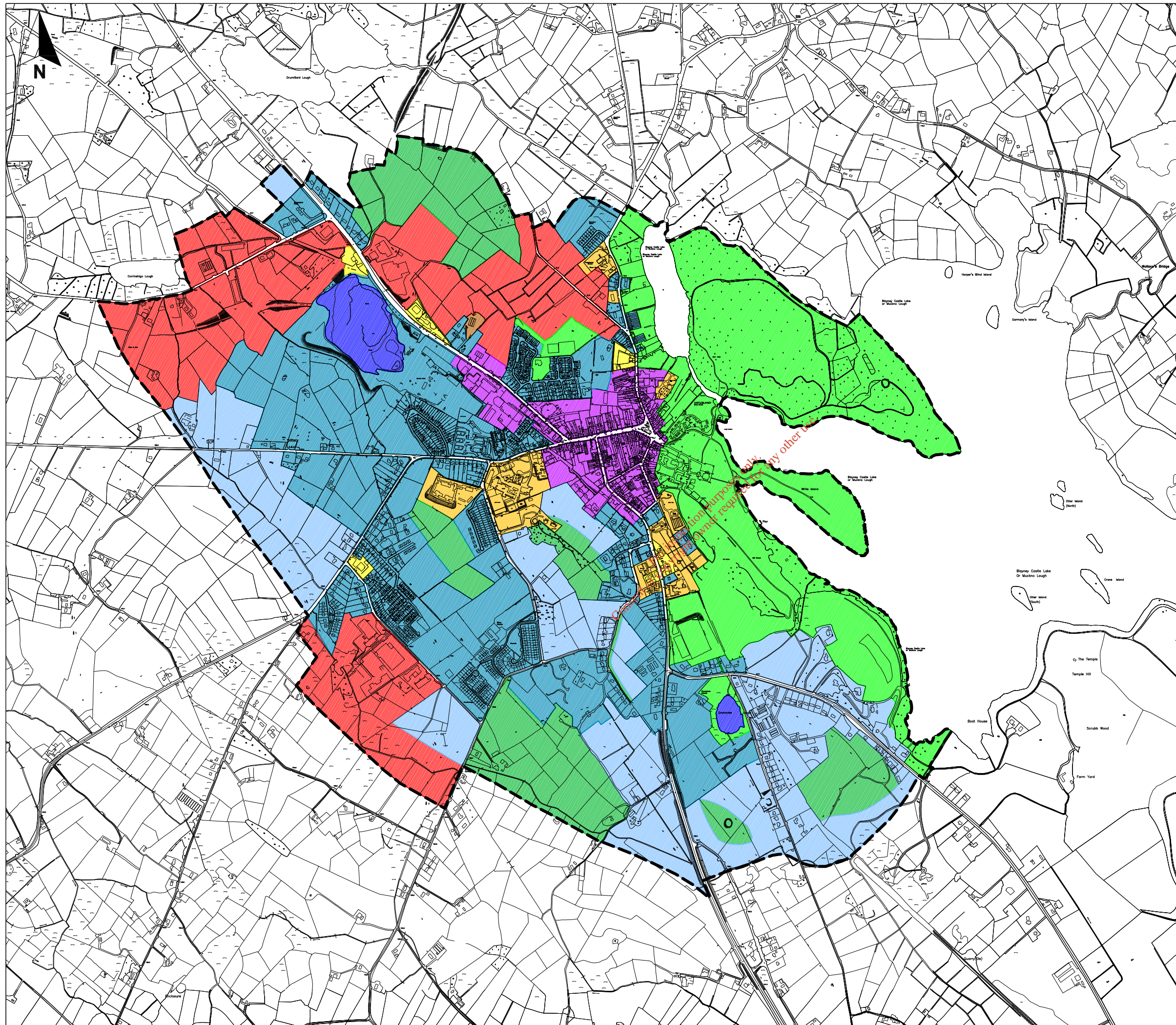
There is a strong interrelationship between recreational provision and the provision of public open space, given that public open space is commonly used for recreational purposes. This is especially relevant to Castleblayney and its efforts to accommodate recreational needs within the confines of Lough Muckno, which is the largest, and by far the most important, stretch of public open space within the town.

Portions of vacant lands and derelict buildings to the rear of Muckno Street and adjacent to Gas Lough and Lough Muckno including the site of the WwTW extension (**Figure 2.1**) are to be included in a Local Area Action Plan. This area offers significant development potential but is likely to remain undeveloped in the absence of the town council taking a pro active role in redevelopment, under the aegis of a comprehensive, detailed, high-quality plan. The town council is to prepare a Local Area Action Plan for this area with the aim of stimulating and directing development in a sustainable manner. Applications for development, which would not inhibit the primary zoning use will be considered on their merits and permission may be granted where the planning authority consider that the proposed use or development would not be detrimental to the primary use objective for that area.

2.3.6 Planning Summary

Provision has already been made for carrying out the Castleblayney wastewater scheme in the National Water Services Investment Programme 2006 - 2008. Upgrading the capacity of the Castleblayney WwTW will help to meet the policies for wastewater treatment contained in the County Monaghan Development Plan, particularly policy WWT2 with regard to:

'Meeting the waste water needs of Castleblayney by the provision of and maintenance of waste water treatment plants to the standards prescribed in the EU Urban Waste Water Treatment Directive'.



- Key**
- Higher density housing
 - Low density housing
 - Commercial uses
 - Civic/Community/Educational uses
 - Recreational amenity
 - Local landscape policy area
 - Industry & employment
 - Agricultural uses
 - Town centre
 - Local area action plan
 - Lakes
 - Development boundary

0 m 750 m
 Scale 1:15,000 @ A3

Entec and O'Dwyer

Nutgrove Office Park
 Nutgrove Avenue
 Dublin 14

Castleblayney WwTW
 Environmental Impact Statement

Figure 2.1
Castleblayney Town Development Plan

February 2008
 19925-R14.dwg marsa01

Entec

Based upon drawing number dr20384-CY-02 courtesy of Nicolas O'Dwyer

3. Description of the Proposed Development

3.1 Site Description and Environs

The existing WwTW is located on the northeast edge of Castleblayney Town, County Monaghan, and adjacent to Black Island and Lough Muckno to the east as shown in **Figure 1.1**. Most of the WwTW site comprises of wastewater treatment infrastructure (aeration tanks, settlement tanks etc.) plus hardstandings including a concrete area used for sludge storage. There is a small area located adjacent to the administrative buildings in the southwest corner of the WwTW site that has been landscaped and planted with a range of shrub species.

The existing WwTW site boundary is surrounded by a high fence. It is screened by tall conifers and a mix of large trees and shrubs along the north and east boundaries. To the west the majority of the WwTW is screened by the cattle market and other commercial properties. To the southwest, beyond the perimeter fence and access track, screening is provided by mature deciduous trees and shrubs. However, a gap in the planting leads to views over the WwTW site from some of the terraced properties to the southwest. To the south the WwTW is screened by a variety of commercial units.

To the immediate north of the WwTW there is an area of hardstanding and beyond this, scrub consisting of small pockets of trees and shrubs littered with construction materials and waste. Further north is an area of dense reeds located along the edge of a lake that forms part of Lough Muckno. The lake is connected to the main body of the lough by a small watercourse running around Black Island.

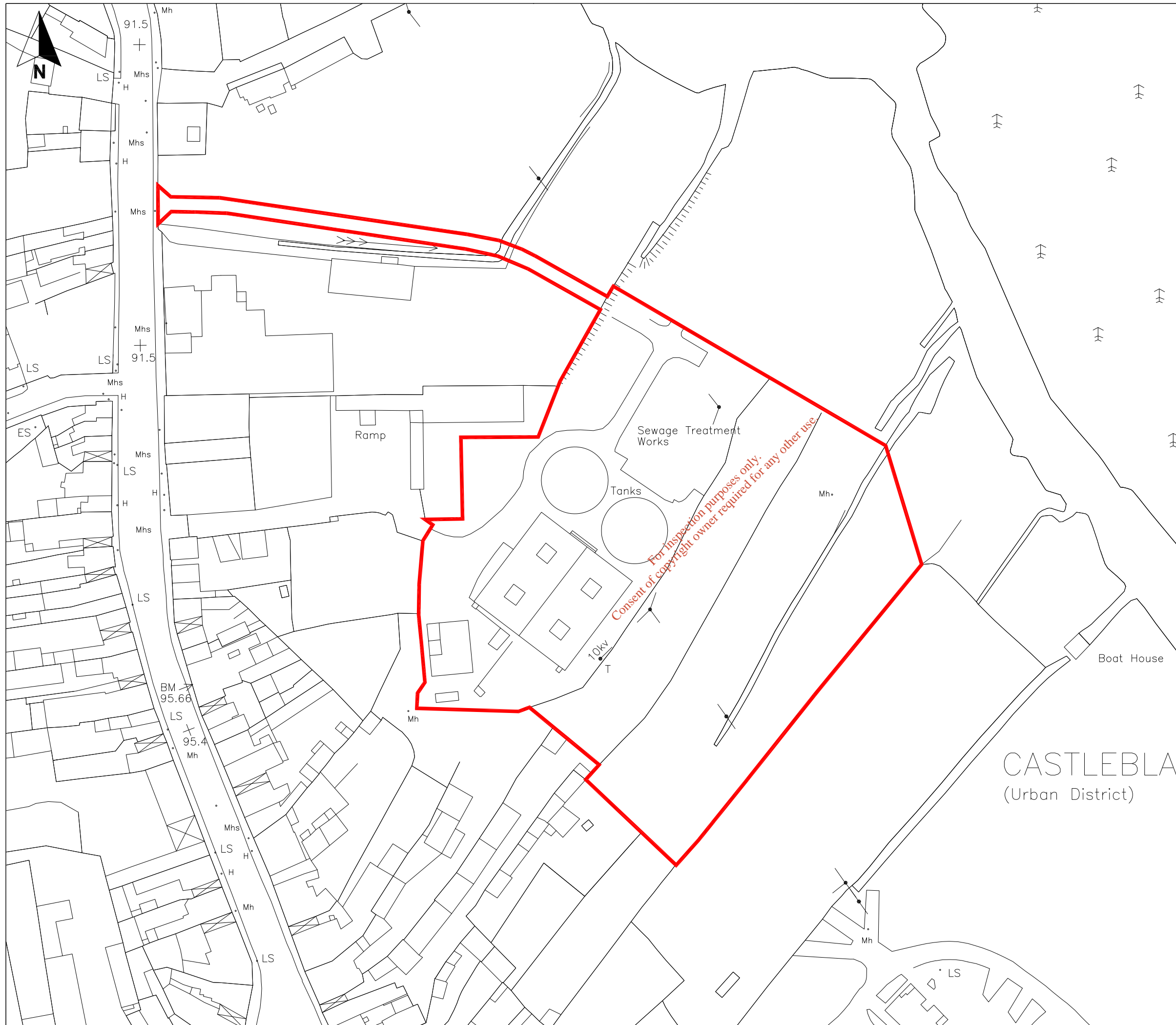
To the immediate east of the WwTW is an area of mature trees and shrubs. Beyond this are the banks of the small watercourse connecting the lake and the West Branch of the River Fane to the north with the main body of Lough Muckno to the southeast. There is a drainage ditch, connecting into this small watercourse, running through the wooded area.

Immediately to the west of the WwTW is situated a cattle market, a warehouse and garage. The access track to the WwTW runs through the cattle market. It adjoins the R181 highway (Muckno Street) along which are a number of residential and other commercial properties are situated, to the southwest a number of these properties back onto the WwTW site. Immediately to the south of the WwTW is a variety of commercial units, further beyond is a caravan park.

The proposed development will be contained within the existing WwTW site boundary plus 0.43 ha of additional land take to the immediate east of the site (**Figure 3.1**). As part of the development a new access road will be constructed from the R181 highway crossing over scrubland to connect into the northwest corner of the existing WwTW site.


3.1.1 Existing Wastewater Treatment

Castleblayney WwTW was built in 1983 to provide secondary treatment and operates as an extended aeration plant with phosphorus reduction, preceded by mechanical screening and grit removal. Sludge dewatering facilities are also provided on site. The dewatered sludge is stored on site prior to transport off site for further treatment and disposal.



Key

 Development site boundary

0 m  500 m
Scale 1:10,000 @ A3

Entec and O'Dwyer

Nutgrove Office Park
Nutgrove Avenue
Dublin 14

Castleblayney WwTW
Environmental Impact Statement

Figure 3.1
Development Site Boundary

February 2008
19925-R15.dwg marsa01

Entec

The layout of the existing WwTW is presented in **Figure 3.2**. The existing WwTW was designed to accommodate 12,960 p.e. and comprises the following elements:

- Preliminary Treatment;
 - Mechanical Screening;
 - Grit Removal;
 - Flow Monitor;
 - Storm Water Tank;
- Secondary Treatment;
 - 2 No. Extended Aeration Tanks, 1,800m³ in volume;
 - 2 No. Settlement Tanks, 16.6m in diameter;
- Phosphorus Removal, chemical dosing with ferric sulphate;
- Sludge Dewatering (single belt press) and Administration Building; and
- Outfall Pipe – 250m long open ended outfall;

The Castleblayney sewerage catchment is drained by a combination of gravity and pumped sewers to the WwTW, in turn discharging to Lough Muckno via a single 250m long open ended outfall to the northeast. The catchment has five pumping stations which serve low-lying areas to the south, northwest and northeast of the catchment. The catchment is reported to be served by a predominately combined sewerage system.

There is currently one full time caretaker and a part time technician employed at Castleblayney WwTW.

3.1.2 Wastewater Treatment Works Capacity Upgrade

At this stage, the design philosophy for the Castleblayney WwTW capacity upgrade has been determined but the detailed design has yet to be finalised. The final detailed design for the project will be developed once the scheme has been granted planning approval. However feasibility design work has shown that suitable wastewater treatment infrastructure can be accommodated on the extended site. Section 1.5.5 identifies how the EIS will take into consideration the currently unknown detailed design that will finally be accepted.

For the purposes of this EIS a conventional activated sludge plan with tertiary treatment has been assessed as the worst-case option as discussed in Section 2.2.2. This would allow the existing concrete tanks (and other supporting infrastructure) to be retained, with a combination of mechanical and electrical refitting to maximise the efficiency of the existing tanks and process units and provision of additional process units to ensure the required level of effluent treatment is provided.

The design philosophy for the Stage 1 capacity upgrade to 14,000 p.e. is to overhaul the existing secondary treatment plant, in particular the existing mechanical and electrical equipment, in order to maximise the efficiency of the existing tanks and process units. The new infrastructure required during Stage 1 will be constructed entirely within the existing WwTW site as presented in the outline layout shown in **Figure 3.3**. The main items of new infrastructure to be installed during Stage 1 include:

- Inlet pumping station



Key

0 m 500 m

Scale 1:10,000 @ A3

Entec and O'Dwyer

Nutgrove Office Park
Nutgrove Avenue
Dublin 14

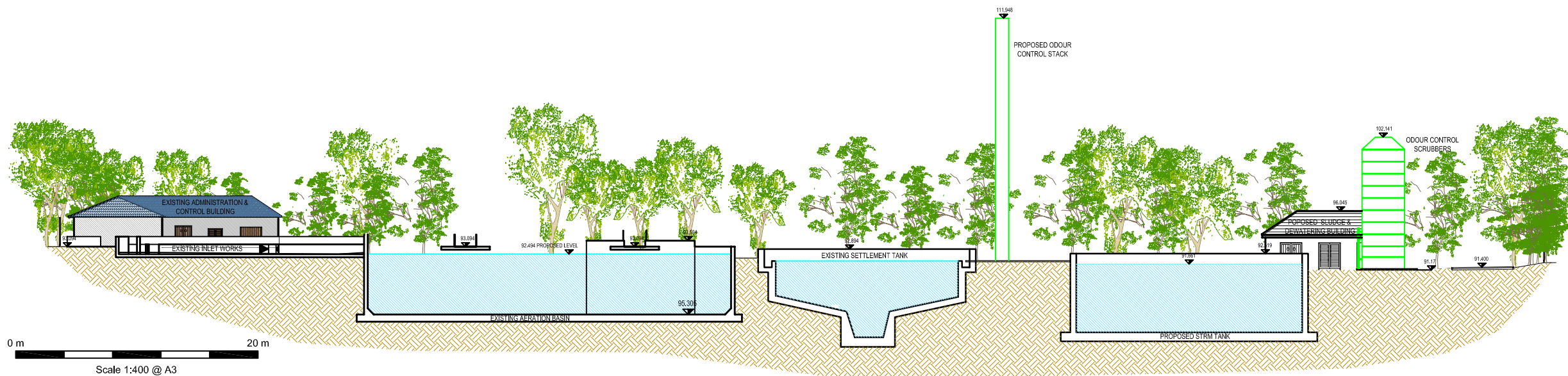
Castleblayney WwTW
Environmental Impact Statement

Figure 3.2
Existing WwTW Layout

February 2008
19925-R16.dwg marsa01

Entec

Based upon drawing number dr20384-CY-06 courtesy of Nicolas O'Dwyer



Entec and O'Dwyer

Nutgrove Office Park
Nutgrove Avenue
Dublin 14

Castleblayney WwTW
Environmental Impact Statement

Figure 3.3
Proposed WwTW Layout

November 2008
19925-R17a.dwg caryg

Entec

- 1 No. storm tank, 1,314m³ in volume;
- Tertiary treatment units;
- Picket fence thickener; and
- New sludge dewatering building.

The Stage 2 capacity upgrade to 28,000 p.e. will require 0.43ha of additional land take immediately to the east of the WwTW site as presented in the outline layout shown in **Figure 3.3**. The new infrastructure required during Stage 2 will double up on the existing secondary treatment infrastructure and be similar in scale to the existing tanks and process units, it is likely to include:

- Inlet works;
- 1 No. storm tanks, 1,314m³ in volume;
- 2 No. aeration tanks, 1,800m³ in volume;
- 2 No. settlement tanks, 16.6m in diameter;
- Picket fence thickener;
- Tertiary treatment units in the form of a sand filter;
- Odour control unit, a three stage wet chemical scrubber plus carbon with a stack height of 20m; and
- Building to house air blowers.

The Contractor may propose alternative layouts to the indicative layout shown in **Figure 3.3**. However, as discussed in Section 1.5.5, these will only be considered appropriate provided effects are equal or its negative effects of lesser significance than those outlined in this EIS.

The transfer of sewage from the catchment will continue via the existing sewer network, pumping stations and pipelines. The WwTW will continue to discharge to Lough Muckno via the existing outfall location. Separate studies are currently being undertaken to assess the condition of the main inlet sewer system to the WwTW and the outfall, the results of these studies will establish what works are required on the inlet sewers and outfall to ensure their continued use.

During Stage 1 a new access road to the WwTW will be constructed, as shown in **Figure 3.3**. The area of land that will accommodate the new access road to the WwTW site comprises derelict brick buildings, shrubs and semi-mature trees interspersed with construction materials and waste that has been deposited in this area. The existing access road will be retained (as it also provides access to the cattle market) but will no longer be utilised by WwTW traffic.

3.2 Construction

3.2.1 Timing of Construction Works

The construction programme for the development has yet to be finalised however the following phasing will apply:

- Stage 1 – estimated 18 month construction period, 2010/2011 anticipated start date; and

- Stage 2 – estimated 18 month construction period, anticipated start date 2020 but this is dependent on population growth.

Construction activities will normally be restricted to between 08:00 and 18:00 hours on weekdays and 08:00 to 13:00 on a Saturday. Evening and night-time working is not expected to take place although it is possible that limited 24 hours working may be required on occasion. This will only take place with the prior agreement of the planning authority and the need to request this will be written into the Contract Documents. Other mitigation measures to be adopted during the construction phase are presented in Sections 5-13 of this EIS. These will be written into the Contract Documents and any deviation from these mitigation measures will have to be justified by the contractor as set out in Section 1.5.5.

3.2.2 Construction Activities

The anticipated construction activities are detailed in **Table 3.1**.

Table 3.1 Anticipated Construction Activities and Timings

Activity	Phasing	Construction works involved
General site clearance	Stage 1	Diggers and small plant used for construction of the lay down and preparation of working areas.
	Stage 2	
General site preparation	Stage 1	This phase mainly involves creation of overlying ground and preparation of a base for foundations.
	Stage 2	
Access road construction	Stage 1	Construction of a new road (approximately 4m wide) to the WwTW site during Stage 1. The existing access track will be utilised during the early stages of Stage 1.
Civil construction	Stage 1	This stage will include the creation of foundations, buildings and services. Main plant used will be diggers for trenching, plus cranes for lifting and laying pipes.
	Stage 2	
Steel erection and installation of mechanical and electrical works	Stage 1	This stage will include steel erection and installation of mechanical plant on foundations using a range of mobile cranes and on-site assembly of plant. Fabrication and installation of pipes and ducts will be undertaken and electrical controls/plant installed.
	Stage 2	

3.2.3 Construction Traffic

For construction of the early stages of Stage 1 the existing access track will be used. The new access road will be constructed as part of the Stage 1 work. The existing entrance will then no longer be used by WwTW traffic although it will be retained as it also provides access to the cattle market.

On an average working day during Stage 1, two one way trips by HGV are anticipated to arise; the maximum number of trips during the peak of construction activity is anticipated to be 15 one way HGV movements. In addition, there will be between 20 and 30 one way trips by light vehicles for construction staff and deliveries.

On an average working day during Stage 2, three one way trips by HGV are anticipated to arise; the maximum number of trips during the peak of construction activity is anticipated to be 22 one way HGV movements. In addition, there will be between 30 and 40 one way trips by light vehicles for construction staff and deliveries.

Access routes will be agreed between the contractor, Monaghan County Council, Castleblayney Town Council and the Garda Síochána.

3.3 Operational Details

There will be a maximum of two full time operatives employed at the WwTW once it is fully operational plus visitors and deliveries. Thus on an average working day two one way trips by light vehicles are anticipated to arise.

The wastes that will be generated from the WwTW process are:

- Screenings;
- Grit residue; and
- Dewatered sludge to be exported for further treatment and disposal.

Additional sludge will be generated by the WwTW upgrade; the present arrangement of skips being used to export the dewatered sludge will continue resulting in approximately two one way HGV movements per week,

The site will be operational 24 hours per day.

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

4. Scoping Report

4.1 Scoping Process

Scoping describes the process of identifying the likely significant environmental effects that should be addressed in an EIS. The scope of this EIS has been defined on the basis of reference to the Environmental Protection Agency's 'Advice Notes on Current Practice in the Preparation of Environmental Impact Statements' and 'Draft Guidelines on the Information to be contained in Environmental Impact Statements'. In addition, consideration has been given to the project team's experience of assessing similar development proposals; information obtained from consultees; and site visits.

4.2 Scoping Report

To assist Monaghan County Council in confirming that the scope of this EIS will enable them to identify the full range of significant environmental effects arising from the proposed development and to facilitate consultation with consultees that may be unfamiliar with the development proposals a Scoping Report was produced. The Scoping Report included the following information:

- Outline description of the proposed development;
- Site location and a description of its environs;
- Purpose of the development proposals; and
- Proposed basis of the EIS.

The Planning Regulations require that major significant effects should be assessed and it is considered that major significant effects were adequately identified in the Scoping Report. The Scoping Report also identified environmental effects of minor and no significance in order that Monaghan County Council and consultees were provided with a complete picture.

4.3 Consultation on the Scoping Report

Consultation is an essential element of the EIA process. It is designed to allow consultees to become engaged in the evolution of the development proposals and to ensure that their concerns and ideas are identified and considered. The Scoping Report was forwarded to Monaghan County Council and consultees to seek their views on the proposed scope of the assessment. The responses received are summarised in **Table 4.1** and included in full in **Appendix B**. These have been addressed within the EIS as appropriate.

Table 4.1 Summary of Responses to Scoping Report

Consultee	Consultee Comments	EIS Response to Comments
Environmental Health Service, Local Health Office (Cavan and Monaghan)	<p>From a public health viewpoint the provision of an improved wastewater treatment facility is welcomed.</p> <p>Scoping Report has identified environmental concerns to be addressed including the effects of increased pollution load on the receiving waters and the effect of local residents of noise, dust etc.</p> <p>From a public health perspective it would be desirable if the EIS also addressed the potential and/or controls for the transfer of infection to humans.</p> <p>If there are any current industrial discharges which could be of public health significance these should be included in the design of the treatment plant.</p>	<p>Section 5 – Air Quality provides and assessment of the effects of dust generation on local residents</p> <p>Section 6 – Noise and Vibration provides an assessment of noise levels on local residents</p> <p>Section 9 – Water Quality takes into account the uses to which the receiving waters are put. It details the effluent standards to be achieved which have been set in relation to the assimilative capacity of the downstream receiving waters.</p> <p>The WwTW upgrade is part of a wider sewerage improvement programme for Castleblayney Town which will include sewerage network improvements. These improvements fall outside of the scope of this EIA but cumulatively should help improve water quality within Lough Muckno.</p>
Eastern Regional Fisheries Board	<p>Welcome the proposal to upgrade the treatment plant and the Scoping Report has addressed most concerns from a fisheries perspective.</p> <p>Also need to consider:</p> <ul style="list-style-type: none"> • Bunding of chemicals stored on site • In-stream construction works • Ensure Lough Muckno and the Fane catchment have the assimilative capacity to handle the potential increase in discharge volume • Precautions during construction to prevent discharge of suspended solids or other deleterious matter to the watercourse <p>Treated effluent discharges to Lough Muckno and ultimately the River Fane. As this lake provides rich coarse fishing and the river is a valuable salmonid river it is important to ensure that the development does not have a negative impact on fisheries.</p>	<p>Section 9 – Water Quality provides an assessment of the effects of construction on Lough Muckno. It details the effluent standards to be achieved which have been set in relation to the assimilative capacity of the downstream receiving waters taking into account the fisheries supported.</p>

Consultee	Consultee Comments	EIS Response to Comments
<p>Monaghan County Council – Executive Chemist</p>	<p>Lough Muckno is:-</p> <ul style="list-style-type: none"> • An area of high amenity value • Designated as a “sensitive area” under the UWWTR • In use for local bathing and water sports • Identified as a Surveillance Monitoring Site under the WFD Monitoring Programme <p>Water Quality Issues</p> <p>Poor bathing water quality (although not a designated area) with microbiological contamination being a significant problem</p> <p>Extensive and long lasting blue-green algal blooms have occurred and flowed down the Fane River to Inniskeen and beyond</p> <p>Water supply sources are located downstream of Lough Muckno – Newry WSS; Inniskeen WSS; and Dundalk WSS</p> <p>Discharges from the wastewater <u>collection and treatment</u> system may not be reflected in effluent quality data as there have been a number of overactive storm overflows discharging upstream of the WwTW outfall. Contaminated sediment in the vicinity of the storm overflows and WwTW outfall could be an ongoing source of enrichment to Lough Muckno.</p> <p>Need to also consider:-</p> <ul style="list-style-type: none"> • Elimination of polluting discharges including storm overflows • Inclusion of effluent polishing • Effluent disinfection to minimise microbial contamination • Measures to minimise discharges of soil/silt laden water during construction <p>Data Sources</p> <p>EIS should include EPA water quality data along with Monaghan County Council data. Sources of data should be quoted and whether the data is from an accredited laboratory or not.</p>	<p>Section 9 – Water Quality provides an assessment of the effects of construction on Lough Muckno. It details the effluent standards to be achieved which have been set in relation to the assimilative capacity of the downstream receiving waters taking into account the uses to which the receiving waters are put.</p> <p>The WwTW upgrade is part of a wider sewerage improvement programme for Castleblayney Town which will include sewerage network improvements. These improvements fall outside of the scope of this EIA but cumulatively should help improve water quality within Lough Muckno.</p>
<p>Environmental Protection Agency</p>	<p>Since a licence application has not yet been received we have no comments at this time.</p>	<p>N/A</p>

4.4 Public Consultation

This EIS will be advertised in accordance with Part X (Section 175) of The Planning and Development Act 2000 so that, before submission of the EIS to An Board Pleanála, Monaghan County Council will,

“publish in one or more newspapers circulating in the area in which it is proposed to carry out the development a notice indicating the nature and location of the proposed development...”

This advert will, amongst others, specify

“the times and places at which, and the period (not being less than 6 weeks) during which, a copy of the environmental impact statement may be inspected free of charge or purchased”.

A public consultation event was to be held by Monaghan County Council in the Castleblayney Enterprise Centre on 19th March 2009. This public consultation event was advertised in a local newspaper, the Northern Standard, on the 5th, 12th and 19th March 2009. Local councillors, the eastern regional fisheries board and other local groups were informed by letter of the public consultation event.

Several members of the public attended the event. No particular comments were received during this event.

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

5. Air Quality, Dust and Odour

5.1 Introduction

The Castleblayney Wastewater Treatment Works (WwTW) capacity upgrade could affect odour on and in the vicinity of the development site. This chapter considers the potential effects of the WwTW capacity upgrade in relation to air quality and odour annoyance. It should be read in conjunction with the project description in **Section 3**.

Regulatory Context - Odour

The issue of malodours from WwTWs has gained increased public recognition over the last 20 years, along with growing expectations of quality of life and a reduced tolerance towards adverse environmental effects of business and utilities upon public amenity.

Odours are not generally additive in the same way as other nuisance parameters such as decibels for noise.⁹ This reflects the way in which the brain responds to odour. The human brain has a tendency to “screen out” those odours which are always present or those that are in context to their surroundings. For example, an individual is more likely to be tolerant of an odour from a factory in an industrial area than in the countryside. The human brain will also develop a form of acceptance to a constant background of local odours.

Published odour detection “threshold” concentrations are available, which define the concentrations at which the human nose detects the presence of an odour. These thresholds are normally established by the use of a panel of people who are exposed to an odorous compound at known concentrations. The concentration is successively diluted until the point is reached at which the odour is just detectable.

Odours are often expressed in terms of odour units (ou_E). An odour unit is defined as one cubic metre of air containing an odour at the detection threshold concentration. The odour recognition threshold in the field is generally about 5 times the detection threshold (ou_{EM}^{-3}). The odour detection threshold is that concentration of a compound in air, which is just detectable to the human nose.

Limited research is available into what constitutes an appropriate and workable odour standard for wastewater treatment. The Concise Guide¹⁰ considers that odours at 5 times their detection threshold (effectively $5 ou_E m^{-3}$) can be considered as having the potential to cause annoyance. Although this guide is not directly aimed at the water industry, it provides for a common guideline as to the historical approaches that have been adopted. A summary of Odour and Olfactometry has been provided in **Appendix C**.

The main criterion adopted in the UK and Ireland to avoid odour annoyance has been derived from the Newbiggin-by-the-Sea public inquiry.^{11,12} The absence of complaints at Newbiggin-by-the-Sea¹³ appears to give weight to the $5 ou_{EM}^{-3}$ 98th percentile compliance, as an annual hourly average at the receptor, being a level of odour that can be tolerated by the population. It

⁹ Environment Agency (2002) DRAFT Horizontal Guidance for Odour Part 1- Regulation and Permitting

¹⁰ Valentin, F.H.H and North, A.A. (1980). Odour Control – a Concise Guide. Department of the Environment.

¹¹ McGovern, JE, Clarkson, CR (1994). The Development of Northumbrian Waters Approach to Odour Abatement for Wastewater Facilities.

¹² Department of the Environment (1993). Report by the Inspector on a Public Enquiry into the Appeal by Northumbrian Water Limited for Additional Sewage treatment Facilities on Land Adjacent to Spital Burn, Newbiggin by the Sea, Northumberland. DoE APP/F2930/A/92/206240.

¹³ Personal Communication with Alan Thompson – Northumbrian Water Limited.

should, however, be noted that sampling was not conducted at this location. As such, it is not possible to categorically enumerate the actual odour concentrations at the receptor, which may be lower or even greater than the $5 \text{ ou}_E \text{ m}^{-3}$ 98th percentile criterion. The Newbiggin-by-the-Sea odour criterion has its origins in a study¹⁴ from the Netherlands.

Although this criterion has been generally been accepted in the water services planning arena, certain circumstances have arisen where the population may be especially sensitive to odour emissions from wastewater treatment, namely through prolonged exposure and encroachment.

Research in the Netherlands¹⁵ has highlighted the complexity of the assessment of odours from WwTWs. It states that situations exist where $5 \text{ ou}_E \text{ m}^{-3}$ has been achieved and no complaints have been received, yet cases also exist where $1 \text{ ou}_E \text{ m}^{-3}$ has been achieved and complaints are still received. Here, the Netherlands Emission Guidelines for Air considers that the exposure concentration where complaints escalate is at concentrations above $2.5 \text{ ou}_E \text{ m}^{-3}$ as the 98th percentile of hourly averages.

The conclusion is that an appropriate nuisance criteria could lie anywhere between $1 \text{ ou}_E \text{ m}^{-3}$ and $10 \text{ ou}_E \text{ m}^{-3}$ (as the 98th percentile of hourly averages) at a critical receptor.¹⁶

For many WwTWs in the UK and Ireland, dispersion modelling output has been assessed against an odour annoyance criterion whereby no critical receptor shall be exposed to a concentration of more than $5 \text{ ou}_E \text{ m}^{-3}$ (as a 98th percentile of hourly averages) as a result of emissions from a WwTW.^{17,18} Entec's extensive experience of applying and designing to this criterion over the last 10 years for wastewater schemes in UK and Ireland indicates that, where compliance occurs, complaints with respect to odour are unlikely. Therefore, this is the significance criterion that has been adopted within this odour assessment.

It is however understood that at WwTW in Ireland planning conditions are typically imposed that require odour concentrations of up to $5 \text{ ou}_E \text{ m}^{-3}$ (as the 98th percentile of hourly averages) at the site boundary as a result of emissions from a WwTW to be achieved. Since such a planning condition may be imposed on Monaghan County Council, this odour assessment also takes into account this potential criterion.

5.2 Scope and Methodology

5.2.1 Scope

In order to ascertain the scope of this assessment a Scoping Report was submitted to Monaghan County Council.

This assessment considers the potential for the existing site and proposed development to give rise to effects upon the quality, dust and odour concentrations at local discrete receptors. This assessment uses measurement and modelling techniques to predict the odour concentrations arising from the existing WwTW and following the proposed development.

¹⁴ Miedema, H.M.E., Walpot, J.I., Vos, H., Steunenbergh, C.F. (2000). Exposure-annoyance relationships for odour from industrial sources. *Atmospheric Environment* 34, 2927-2936.

¹⁵ Information Centre for the Environment (2001). Netherlands Emission Guidelines for Air. InfoMil

¹⁶ Hall, D. L., McIntyre, A. E., (2004). The Derivation of Odour Standards and their Role and the Foundation of Odour Management Plans for Planning Regulation. In Proceedings of the Second National Conference Volume Two September 2004. Ed N. J. Horan

¹⁷ McGovern, JE, Clarkson, CR (1994). The Development of Northumbrian Waters Approach to Odour Abatement for Wastewater Facilities

¹⁸ Department of the Environment (1993). Report by the Inspector on a Public Enquiry in to the Appeal by Northumbrian Water Limited for Additional Sewage treatment Facilities on Land Adjacent to Spital Burn, Newbiggin by the Sea, Northumberland. DoE APP/F2930/A/92/206240

The potential for adverse effects to affect sensitive locations as a result of increases in the concentration of air quality standard pollutants and odour during the construction phase is very small and of only temporary duration, therefore, no further assessment is required in relation to this scenario.

There are likely to be some emissions of dust during the construction stage of the development, associated with demolition and construction activities. It has been found that dust deposition on neighbouring receptors is unlikely to be significant at a distance of more than 100m from the dust source, when there is no mitigation in place and when the receptor is in the path of the prevailing wind.¹⁹ Given the uncertainties in modelling fugitive dust, particularly arising from a variable source such as construction activities, it is not considered that a quantitative assessment would be appropriate and a qualitative, risk based approach to dust assessment and control has been adopted. Appropriate dust mitigation can be highly effective at reducing dust generation and minimising dust dispersion off site.

In the Scoping Report it was acknowledged that the operation of the site, due to the increase in capacity, will result in an increase in the volume of sewage sludge produced, consequently there will be a slight increase in the number of HGV movements. These have the potential to contribute to traffic emissions of NO_x, VOC, PM₁₀ and CO, with the significance of this effect dependent upon the number of vehicles visiting the site on a day-to-day basis.

It is estimated that the site will generate 1-2 light commercial vehicles per day and 1-2 HGVs per week. The traffic assessment (Section 11) has shown that the operation of the WwTW is not predicted to result in significantly increased levels of traffic. Therefore, traffic related air quality is not considered to be a significant issue and has been scoped out of the overall assessment.

There are also no operational emissions to air of any of the air quality strategy (AQS) pollutants therefore further assessment in terms of operational emissions to air is not justified.

5.2.2 Methodology

The issue of odour from the operational site has been fully assessed. The baseline emissions were determined by an odour survey which was undertaken on the 25th October 2007. This identified the odour emission rates from of each of the discrete elements of the current WwTW infrastructure and processes. Emission rates for the proposed process were obtained from an extensive database of emission rates compiled from previous Entec experience.

Operational phase changes to the odour concentrations at local sensitive receptors have been assessed through the use of AERMOD dispersion modelling. Details of the dispersion model and model inputs are presented in **Appendix D**. The predicted concentrations of pollutants as a result of the operation of the proposed development (under a number of mitigation scenarios) have been calculated for each year of available meteorological data at the seven closest sensitive receptors (for receptor locations see Appendix D).

A number of mitigation scenarios were run to determine acceptable odour control strategies, these being:

- 1) Sludge dewatering facility extracted to a biofilter, an odour control unit consisting of a 5m stack. All other sources are uncovered.
- 2) Scenario 1 with the addition of a second odour control unit allowing both picket fence thickeners (PFT) to be extracted. The Stage 1 PFT is extracted to the biofilter that the sludge

¹⁹ Development Control: Planning for Air Quality, NSCA, 2006.

dewatering facility is extracted to under Scenario 1, the Stage 2 PFT is extracted to the second odour control unit located immediately north-west of the Stage 2 PFT. All other sources are uncovered.

3) Scenario 2 with the additional abatement option of chemical dosing for both inlet works.

4) Single odour control unit comprising a three stage wet chemical scrubber plus carbon with a stack height of 20m, relocated to the centre of the site to which all sources, except the four settlement tanks, are extracted. The settlement tanks though not extracted are chemically dosed.

5a) The extraction of all odour sources to an odour control unit comprising a three stage wet chemical scrubber plus carbon located in the centre of the site with a stack height of 20m. Before extraction all of the sources are chemically dosed.

5b) Scenario 5a with a stack height of 13m rather than the 20m.

5c) Scenario 5a with the relocation of the OCU to a boundary location to the north-east of the site, representing the greatest distance from the discrete receptors.

A diagrammatic representation of each of the scenarios detailing the abatement measures that have been assessed within the model can be found within **Appendix E**.

5.3 Existing Environment

5.3.1 Baseline Information Sources

Area sources were monitored using a sampling hood on the 25th October 2007. The hood was placed over the area of interest and ventilated with odour free air at a known rate to give an air velocity over the surface of between 0.3 and 0.5 m s⁻¹. Samples were then collected at the outlet into inert Nalophan A bags.

All odour samples were taken in duplicate to increase the confidence intervals. The lower limit confidence interval with a duplicate sample would be $\leq 77.9\%$ with an upper limit confidence interval of $\geq 95.5\%$ ²⁰. All samples were collected and analysed in accordance with the protocols laid down in BS EN 13725:2003 for Olfactometry¹¹. The existing odour emissions from each source at the site were calculated. Through dispersion modelling, the information on baseline odour concentrations and therefore the likelihood of odour annoyance currently experienced at local receptors were calculated.

No other similar odour sources are known to be located in the vicinity of the existing WwTW site.

5.3.2 Existing Situation

The existing WwTW operates as an extended aeration plant with phosphorus reduction preceded by screening and grit removal. Sludge dewatering facilities are also located on the site, with the dewatered sludge is stored on site prior to being exported off site for further treatment and disposal. Sources of odour on the site include; the inlet works, two aeration tanks, two settlement tanks and a covered storm tank with odorous emissions from five stacks.

An AERMOD dispersion model assessment has been constructed using the most recent 5 years' meteorological data from Connaught Meteorological station. Meteorological data for the years 2002-2006 were obtained from Belfast Airport meteorological station which is located

²⁰ British Standard Institute (2003) Air Quality- Determination of odour concentration by Dynamic Olfactometry pr EN 13725:2003

approximately 72 km to the north of Castleblayney. The concentration of odour at critical receptors within the vicinity of the site have been calculated, the baseline scenario and the proposed scenarios modelled utilising the sampled odour data in addition to source inputs from Entec's extensive library of emission rates. This database has been compiled through sampling exercises undertaken by Entec in the UK and Ireland over the past 10 years.

Appendix D presents the results of the odour emission monitoring of the main sources on the existing site. The modelled odour concentrations at the most contiguous receptors (as shown in Appendix D) and boundary are presented in **Table 5.1** and **Table 5.2**.

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

Table 5.1 Existing Modelled Odour Concentrations at Discrete Receptor Locations

Receptor	Location (x, y coordinates)	Odour Concentration, $\text{ou}_E \text{m}^{-3}$ as 98 th percentile of hourly averages, for each year of meteorological data				
		2002	2003	2004	2005	2006
1	-34.8, 16.9	18.5	24.6	10.1	17.4	31.4
2	-6.6, 43.9	2.9	3.2	3.3	2.6	6.5
3	-82.7, 54.8	5.1	7.1	2.1	3.6	10.0
4	-107.7, 94.1	3.1	5.7	2.3	4.1	9.3
5	-106, 39.1	2.7	5.0	2.3	1.7	5.7
6	22.4, -129.5	0.9	1.0	1.0	1.7	1.9
7	126.5, -73.7	1.1	2.6	6.2	3.6	2.7

Note: Concentrations in bold indicate an exceedance of the accepted odour criteria.

Table 5.2 Maximum Predicted Odour concentrations at Boundary for the Existing Works

Location of maximum concentration (co-ordinates x,y)	Year of meteorological data	Maximum concentration ($\text{ou}_E \text{m}^{-3}$ 98 th ile /hour)	Minimum concentration ($\text{ou}_E \text{m}^{-3}$ 98 th ile /hour)	Total number of boundary receptors above $2 \text{ou}_E \text{m}^{-3}$ (of the 21 boundary receptors modelled)
0.6, 22.1	2006	104.7	8.5	21

The results of the modelling of the exiting site emissions displayed in **Table 5.1** and **Table 5.2** highlight that, odour emissions originating from the existing WwTW in Castleblayney are consistently above both the $5 \text{ou}_E \text{m}^{-3}$ significance criteria at discrete receptor locations and at the site boundary. In the future, if a “business as usual” scenario continued at the works, it is likely that this would continue to be the case. The results show that the closest sensitive receptor located to the site, receptor one, is subjected to the highest odour concentration at the 98th percentile of hourly averages of $31.4 \text{ou}_E \text{m}^{-3}$ based on 2006 meteorological data.

5.3.3 Predicted Trends

It is expected that odour emissions would remain unchanged in the business as usual scenario. Odour concentrations in the local area would vary based on the effects of local meteorology, as illustrated in **Table 5.1**, and can be expected to exceed the criteria.

5.3.4 Information Gaps

No information gaps were identified.

5.4 Potential Effects and Incorporated Mitigation

5.4.1 Potential Effects during Construction and Incorporated Mitigation

Dust

Although no quantitative data is available on the dust impact arising from construction of the development, qualitatively it can be deduced that an impact could arise from the construction phase for any receptors that are located less than 100m from the site. There are receptors that are located less than 100m, thus at these locations there is the potential for dust nuisance. Mitigation measures from the guidance within the control of dust and emissions from construction and demolition best practice guidance²¹ will therefore need to be adopted. Measures to suppress the generation of dust during construction activities may include:

- Erect effective barriers around dusty activities or the site boundary to prevent dust from being carried outside the boundary;
- Hard surface site haul routes, as unpaved haul routes can account for a significant proportion of fugitive dust emissions;
- Where possible, haul routes and site access points should be located away from nearby receptors;
- No bonfires will be allowed on site;
- Plan site layout any machinery, fuel and dust generating activities should not be located close to the boundaries and sensitive receptors if possible;
- No idling vehicles will be allowed from construction vehicles;
- Covered loads will be required for any potential dust emitting loads. No site runoff of water or mud; and
- Use of water as a dust suppressant will be required on any significant soil stockpiles or bare earth during dry periods.

Air Quality

During the construction phase there is no predicted change from the current baseline conditions for air quality, therefore no additional mitigation is considered necessary for this phase of the development.

Odour

During the construction phase there is no predicted change from the current baseline conditions for odour, therefore no additional mitigation is considered necessary for this phase of the development.

¹⁴ Greater London Authority (2006) The control of dust and emissions from construction and demolition, Best Practice Guidance, p 8-29

5.4.2 Predicted Effects during Operation and Incorporated Mitigation

Odour

The proposed new infrastructure comprises; a sludge dewatering facility, tertiary treatment, two picket fence thickeners, additional inlet works, two storm water tanks (replacing the existing), two additional aeration tanks and two additional settlement tanks.

The proposed development could change the ambient odour levels in the local area. Due to the high concentrations of odour predicted for the proposed development, different scenarios of the available odour abatement options have been modelled in order to determine the option most likely to achieve the significance criterion of $5 \text{ ou}_{\text{EM}}^{-3}$ and a site boundary criteria of $5 \text{ ou}_{\text{EM}}^{-3}$.

The mitigation measures that have been modelled within this assessment to determine the most appropriate odour control option for this site are detailed in Section 5.2 (a diagrammatic representation of each scenario can be found within **Appendix E**).

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

Table 5.3 Summary of Incorporated Mitigation

Receptor	Predicted Effects	Incorporated Mitigation Measures and Rationale for their Likely Effectiveness
Construction		
Discrete Receptors	Potential for fugitive dust to have an intermittent or likely impact on discrete receptors	Likely effectiveness: implementation of suggested mitigation measures will help reduce the impact of the construction activities to low risk: where there is a potential for dust to have an infrequent impact on discrete receptors.
Operation		
Discrete Receptors	Potential to cause annoyance through exceeding the significance criteria of 5 ou _E m ⁻³ as the 98 th percentile of hourly averages.	Odour abatement measures have been assessed to identify an abatement strategy that could adequately minimise the risk of odour annoyance. An assessment of the likely effectiveness of these abatement scenarios is presented in Section 5.5 .
Site Boundary	Potential exceedance of the criterion of 5 ou _E m ⁻³ as the 98 th percentile of hourly averages at the site boundary.	Odour abatement measures have been assessed to identify the potential for exceedance of the developers 5 ou _E m ⁻³ as the 98 th percentile of hourly averages at the site boundary. An assessment of the likely effectiveness of these abatement scenarios is presented in Section 5.5 .

5.4.3 Implementation of Mitigation and Enhancement Measures

The responsibility and implementation mechanisms for the mitigation measures that have been suggested are presented within **Table 5.4**.

Table 5.4 Implementation of Mitigation and Enhancement Measures

Incorporated Mitigation Measures	Responsibility for Implementation	Implementation Mechanism
Construction		
Dust control	Contractor	Requirement for Dust Management Plan to be included in Contract Documents.
Operation		
Odour abatement	Contractor	Specific requirements in relation to odour control will be included in the Contract Documents.

5.5 Assessment of Effects

5.5.1 Significance Evaluation Methodology

A quantitative assessment criterion has been chosen to assess the effects of odour on the local area. The criterion adopted, on the basis of experience in the Netherlands (Clarkson and McGovern 1994),²² takes into account the relationship between odour concentrations and the time of exposure, to determine resulting nuisance. For example a ‘faint odour’ that can be perceived by a person for a few hours per year, with those hours dispersed throughout the year, would be unlikely to cause annoyance. Whereas the same concentration perceived for the majority of the year, undoubtedly would.

It is generally accepted that odour concentrations below 5 ou_Em⁻³ above background levels are unlikely to give rise to a nuisance.²³ Therefore, this is the significance criterion that has been adopted within this odour assessment.

Planning conditions are typically imposed that require odour concentrations of up to 5 ou_Em⁻³ (as the 98th percentile of hourly averages) at the site boundary as a result of emissions from a WwTW to be achieved. Since such a planning condition may be imposed on Monaghan County Council, this odour assessment also takes into account this potential criterion.

The assessment criteria used in this survey is summarised within **Table 5.5**.

Table 5.3 Impact Threshold Limits for Odours

Odour Level (ou _E m ⁻³)	Likely Level of Impact
Recommended Criteria at Receptors	
<5 at receptors	Not Significant
>5 at receptors	Significant

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

5.5.2 Predicted Effects during Construction and their Significance

There are no predicted effects during construction.

5.5.3 Predicted Effects during Operation and their Significance

Table 5.6 details the predicted odour concentrations at discrete receptors for the year of meteorological data giving the highest concentrations for the proposed development. **Table 5.7** details the maximum concentrations modelled at the site boundary for the proposed development. The concentrations for each year of meteorological data modelled and associated odour contour plots are located in **Appendix F**.

²² The development of Northumbrian Water Ltd approach to odour abatement for wastewater facilities, IWEM Odour Control Symposium, 1994.

²³ Odour Control- A Concise Guide. Warren Spring Laboratory 1980

Table 5.4 Predicted Odour Concentration at Discrete Receptor Locations

Scenario assessed	98 th Percentile of Hourly Odour Concentrations ($\text{ou}_E \text{m}^{-3}$)						
	Receptor 1	Receptor 2	Receptor 3	Receptor 4	Receptor 5	Receptor 6	Receptor 7
Scenario 1	43.5	18.0	23.4	12.8	11.1	7.2	14.1
Scenario 2	39.1	15.3	18.0	9.2	10.6	6.9	10.4
Scenario 3	20.0	8.0	9.5	5.0	5.6	3.7	5.5
Scenario 4	2.45	0.95	0.75	0.41	0.56	0.43	0.95
Scenario 5a	0.02	0.03	0.07	0.17	0.09	0.06	0.06
Scenario 5b	0.12	0.14	0.50	1.04	0.36	0.13	0.26
Scenario 5c	0.08	0.08	0.11	0.14	0.21	0.08	0.08

Note: Odour concentrations of less than $5 \text{ou}_E \text{m}^{-3}$ for 2% of the year (98th percentile) are unlikely to give rise to a nuisance. Concentrations in bold indicate an exceedance of the recommended significance criteria.

Note: For scenarios 5a and 5b the worst case year was 2003. For scenario 5c the worst case year was 2006.

Under Scenario 1 and Scenario 2 all of the discrete receptors would be exposed to odour concentrations much greater than the recommended significance criteria of $5 \text{ou}_E \text{m}^{-3}$. The abatement measures included in Scenario 3 result in almost a 50% decrease in the odour concentration at the worst case discrete receptor (receptor 1; x: -34.8, y: 16.9) when compared to the results of Scenario 2. In Scenario 4 the predicted odour concentrations at each of the discrete receptor locations modelled are below the recommended significance criteria of $5 \text{ou}_E \text{m}^{-3}$.

Table 5.5 Maximum Predicted Odour Concentrations at the Site Boundary (Scenario 1)

Scenario assessed	Location of maximum concentration (co-ordinates x,y)	Year of meteorological data	Maximum concentration ($\text{ou}_E \text{m}^{-3}$ 98 th ile /hour)	Minimum concentration ($\text{ou}_E \text{m}^{-3}$ 98 th ile /hour)
Scenario 1	36,85.6	2006	301	31
Scenario 2	19.9, -0.4	2006	240	19
Scenario 3	19.9, -0.4	2006	123	9.8
Scenario 4	25.9,68.4	2006	18.3	2.6
Scenario 5a	3.2,3.3	2002	0.01	0.00
Scenario 5b	3.2,3.3	2006	0.06	0.00
Scenario 5c	3.2,3.3	2002	0.05	0.00

Note: Concentrations in bold indicate an exceedance of the odour criteria.

Scenario four is required to meet the boundary criteria of $5 \text{ou}_E \text{m}^{-3}$. Scenario five is required to meet a boundary criteria of $2 \text{ou}_E \text{m}^{-3}$.

5.5.4 Cumulative Effects

No cumulative effects have been identified.

5.5.5 Compensation Measures

No compensation measures are required.

5.5.6 Additional Mitigation/Enhancement Measures

All of the modelled odour control strategies have been previously identified. This modelling shows the applicability of various options and no further mitigation is therefore identified.

5.5.7 Summary of Significance Evaluation

To summarise, the effects and the evaluation of significance of each of the environmental effects are reported within **Table 5.8** and **Table 5.9**.

The findings of the complete assessment are that if scenario four is implemented the odour concentrations at each of the receptors will be well below the significance criterion of $5 \text{ ou}_E \text{ m}^{-3}$ (as the 98th percentile of hourly averages) at the nearest receptor and no significant effects as a result of odour will occur.

A more stringent site boundary criteria required one of the three scenario five options to be adopted.

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

Table 5.6 The Significance of Odour Impacts for Each of the Modelled Odour Abatement Scenarios

Scenario	Significance of odour impact when assessed against significant criterion of 5 ou _E m ⁻³ at each receptor							Odour impact at the site boundary	Estimated cost of abatement option (€)
	Receptor 1	Receptor 2	Receptor 3	Receptor 4	Receptor 5	Receptor 6	Receptor 7		
Existing	Significant	Significant	Significant	Significant	Significant	Not Significant	Not Significant	> 5 ou _E m ⁻³	N/A
Scenario 1	Significant	Significant	Significant	Significant	Significant	Significant	Significant	> 5 ou _E m ⁻³	320,000
Scenario 2	Significant	Significant	Significant	Significant	Significant	Significant	Significant	> 5 ou _E m ⁻³	760,000
Scenario 3	Significant	Significant	Significant	Significant	Significant	Not Significant	Significant	> 5 ou _E m ⁻³	850,000
Compliant Scenario 4	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	< 5 ou _E m ⁻³	5.1 Million
Compliant Scenario 5a	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	< 2 ou _E m ⁻³	8.2 Million
Compliant Scenario 5b	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	< 2 ou _E m ⁻³	8.2 Million
Compliant Scenario 5c	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant	< 2 ou _E m ⁻³	8.2 Million

*When assessing against the potential planning condition criteria at the boundary (as opposed to the significance criteria)

Table 5.7 Effects and Evaluation of Significance

Environmental Effect		Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance Level	Rationale
Odour annoyance when assessed against the significance criterion of 5 ou _E m ⁻³ as the 98 th percentile of hourly averages at the receptor	Receptor 1	- ve	Unlikely	Local	Negligible	Not Significant	For Receptors 1-5, if the abatement options within scenario 4 or 5a, b or c are implemented it is predicted that the concentrations at each of the receptors will be well below the 5 ou _E m ⁻³ as the 98 th criteria. For receptor 6 If the abatement options within scenario 3, 4 or 5a, b or c are implemented it is predicted that the concentrations at this receptor will be well below the 5 ou _E m ⁻³ as the 98 th criteria. For receptor 7, if the abatement options within scenario 4 or 5a, b or c are implemented it is predicted that the concentrations at this receptor will be well below the 5 ou _E m ⁻³ as the 98 th criteria.
	Receptor 2	- ve	Unlikely	Local	Negligible	Not Significant	
	Receptor 3	- ve	Unlikely	Local	Negligible	Not Significant	
	Receptor 4	- ve	Unlikely	Local	Negligible	Not Significant	
	Receptor 5	- ve	Unlikely	Local	Negligible	Not Significant	
	Receptor 6	- ve	Unlikely	Local	Negligible	Not Significant	
	Receptor 7	- ve	Unlikely	Local	Negligible	Not Significant	
Odour annoyance assessed against a site boundary criterion of 2ou _E m ⁻³ as the 98 th percentile of hourly averages	Site Boundary	- ve	Likely	Local	Negligible	Not Significant	If one of the scenario 5 abatement options (a, b or c) is implemented this will enable concentrations well below 2ou _E m ⁻³ as the 98 th percentile of hourly averages at the boundary. However scenario four, which is compliant with the significance criteria will ensure odour concentrations are not significant.
NB. Potential planning condition criteria not significance criteria							

6. Noise and Vibration

6.1 Introduction

This chapter considers the potential noise effects of the WwTW capacity upgrade, including the installation of additional treatment plant and construction of a new access road. The existing WwTW is located on the north-east edge of Castleblayney Town, adjacent to Lough Muckno, close to a number of residential properties. The existing local noise sources include road traffic noise from local roads and noise associated with the existing treatment plant.

Regulatory Context

The Environmental Protection Agency published in 2006 a *Guidance Note for Noise in Relation to Scheduled Activities* listed in the Environmental Protection Agency Act, 1992. WwTW are not included in the First Schedule to the Environmental Protection Agency Act and therefore this guidance is not directly applicable. However this document does present the general guidelines that in an ideal situation total noise at sensitive receptors should not exceed, specifically a daytime $L_{A_{rT}}$ of 55 dB between the hours of 08:00 and 22:00 and 45 dB at all other times. This is the equivalent continuous sound pressure level which has been corrected for tonal or impulsive components following the procedure outlined in the document.

Section 107 of Environmental Protection Agency Act allows the EPA or local authorities to serve a Notice requiring measures to be taken to prevent or limit noise. To date there are no national standards for noise emissions in Ireland and therefore, where appropriate, reference has been made to appropriate British Standards in this assessment.

Noise Terminology

The ratio between the quietest audible sound and the loudest tolerable sound is a million to one in terms of the change in sound pressure. Because of the wide range a scale based on a logarithmic basis is used in noise level measurement. The scale used is the decibel (dB) scale which extends from 0 dB to 140 dB corresponding to the intensity of the sound pressure level. The ear has the ability to recognise a particular sound depending on the pitch or frequencies found at the source.

Microphones cannot differentiate noise in the same way as the ear; and to counter this weakness the noise-measuring instrument applies a correction to correspond more closely to the frequency response of the ear. The correction factor is called "A-Weighting" and the resulting measurements are written as dB(A). "A-Weighting" refers to the noise level that represents the human ear's response to sound. The dB(A) is internationally accepted and has been found to correspond well with people's subjective reaction to noise. Typical dB(A) levels for familiar noises are given in **Table 6.1**.

Table 6.1 Typical Noise Levels

Approximate Noise Level dB(A)	Example
0	Limit of hearing

Approximate Noise Level dB(A)	Example
30	Rural area at night, no wind or adverse weather conditions
40	Library
50	Quiet office without noisy machinery, such as typewriters
60	Normal conversation
70	In car noise without radio
80	Household vacuum cleaner
100	Pneumatic drill
140	Threshold of pain

Noise levels vary over time depending on noise generating activities. The following indices are used to take account of these variations:

- SPL is the instantaneous sound pressure level, it is a measure of the noise level at a particular point in space. The SPL of a noise source will vary with distance from the noise source.
- SWL is the instantaneous sound power level, it is a measure of the sound energy produced by a noise source.
- $L_{Aeq T}$ is the equivalent continuous sound level and is the sound level of a steady sound having the same energy as a fluctuating sound over the same period. It is possible to consider this level as the ambient noise encompassing all noise at a given time. $L_{Aeq T}$ is considered the best general purpose index for environmental noise
- L_{A90} index represents the noise level exceeded for 90 percent of the measurement period and is used to indicate quieter times during the measurement period. It is usually referred to as the background noise level.
- L_{A50} and L_{A10} refer to the level exceeded for 50% and 10% of the measurement period respectively. L_{A10} is widely used as a descriptor of traffic noise.
- L_{Amax} is the maximum recorded noise level during the measurement period.

6.2 Scope and Methodology

6.2.1 Scope

In order to ascertain the scope of this assessment a Scoping Report was submitted to Monaghan County Council in October 2007.

Noise effects are considered during both the construction and operational phases of the project. The assessment includes any noise effects associated with operational traffic, since increases in traffic due to the operation of the development could potentially result in significant effects. The noise effects of construction traffic are also discussed, as whilst they will be of short duration, greater traffic volumes may be involved.

Vibration effects have not been considered in detail as part of this assessment, since it is not anticipated that there will be any significant sources of vibration associated with the operational phase of the development. Detailed construction methods have not been finalised, hence it is not possible to make an assessment of construction vibration. However it is not envisaged that any significant vibration impacts would arise during construction.

6.2.2 Methodology

Baseline noise data from September 2007 were used to provide the basis for the assessment, a number of sensitive receptors have been identified in close proximity to the development site and these are used as the basis for the assessment.

Construction noise effects have been assessed using the methodology and information outlined in BS5228 *Noise and Vibration Control on Construction and Open Sites, 1997* with guidance on the acceptability of construction noise levels taken from the Department of the Environment (DoE) Advisory Leaflet (AL) 72. In addition to the *Guidance Note for Noise in Relation to Scheduled Activities*, further details are drawn from BS4142 *Method for Rating Industrial Noise affecting Mixed Residential and Industrial Areas, 1997* to assess noise effects from the operational phase of the development.

6.3 Baseline Environment

6.3.1 Baseline Information Sources

In order to characterise the existing noise environment, a noise survey was undertaken on 27 September 2007. Noise monitoring was carried out to characterise the noise environment at sensitive receptors (**Figure 6.1**) in the vicinity of the WwTW site. The following three locations were monitored:

- Receptor 1: property to the north of the WwTW (410m to nearest plant)
- Receptor 2: property to the west of the WwTW (65m to nearest plant)
- Receptor 3: property to the south of the WwTW (342m to nearest plant)

It is understood that the WwTW processes will operate 24 hours a day and therefore the daytime and night-time noise levels were measured. A CEL 480 Class 1 sound level meter was used for the monitoring. The calibration levels were checked before and after each monitoring period, and no significant drift was recorded. Measurements were undertaken at various times at each location, in order to describe the noise environment at different times of the day and night.



Key

● Receptor

0 m 300 m

Scale 1:5000 @ A3

Entec and O'Dwyer

Nutgrove Office Park
Nutgrove Avenue
Dublin 14

Castleblayney WwTW
Environmental Impact Statement

Figure 6.1
Noise Receptors

February 2008
19925-R18.dwg marsa01

Entec

Daytime measurements were of 15 minutes, night-time measurements were of 5 minutes duration (as described in BS4142 *Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas*, 1997).

Weather conditions during the monitoring period were generally warm and without rain during both the day and night-time. Wind speed and direction were measured using a Meteos Skywatch portable anemometer. Average wind speeds were below 5m/s during all measurements.

6.3.2 Existing Situation

The noise monitoring results are summarised in **Table 6.2** using relevant noise descriptors. Noise results are detailed in full in **Appendix A**, along with comments on audible noise sources present during each measurement. At Receptor 1, noise levels were below the measurable range of the sound level meter for a number of the periods monitored, but two measurement periods were recorded.

Table 6.2 Summary of Monitored Noise Levels

Location	Average Daytime LAeq,15min	Average Daytime LA90,15min	Average Night Time LAeq,5min	Lowest Night Time LA90,5min	Comments on Noise Environment
Receptor 1	64	42	54	30	Road traffic noise
Receptor 2	51	50	51	50	WwTW and local and distant road traffic noise
Receptor 3	48	44	45	36	Local and distant road traffic

During the daytime, the noise environment at Receptor 1 was influenced by noise from road traffic. At night, occasional road traffic noise was the dominant noise source. The noise environment at Receptor 2 during the day was dominated by the WwTW and road traffic passing on the nearby N2 road. At night the predominant noise sources were the WwTW and occasional distant traffic. At Receptor 3, noise sources that were clearly audible during the survey were road traffic on nearby roads and distant road traffic.

Table 6.2 shows that noise levels are quieter during night-time periods than daytime periods at Receptor 1 and Receptor 3. However, at Receptor 2 the measured noise levels at night are the same as those measured during the day. This is an indication that the existing WwTW is the dominant noise source as it is operational 24 hours a day. The lowest LAeq and LA90 levels during both day and night-time were measured at Receptor 1.

6.3.3 Predicted Trends

Given the semi-rural character of the area, it is expected that noise levels will remain relatively constant over coming years, increasing where receptors are influenced by traffic noise by a small, but insignificant, amount in line with forecast traffic growth.

6.3.4 Information Gaps

No information gaps of significance have been identified.

6.4 Potential Effects and Incorporated Mitigation

6.4.1 Potential Effects during Construction and Incorporated Mitigation

Noise effects relating to the construction period are likely to originate from on-site construction activities and from construction related traffic.

Predictions for construction noise from on-site activities

Construction activities will normally be restricted to between 07:00 – 19:00 hours on weekdays. Evening and night-time working is not expected to take place although it is possible that limited 24 hour working may be required on occasion. This will only take place with the prior agreement of the planning authority and the need to request this will be written into the Contract Documents. Likewise, weekend working will not be permitted under normal circumstances, however prior agreement will be similarly required if weekend working was necessary to meet a specific need.

The construction programme has not been finalised, however for indicative purposes, it is considered likely that construction will include the following general activities which may have the potential to result in noise effects.

- Site clearance and preparation – clearance of existing vegetation, modification of site levels, preparation of ground for foundations, creation of construction compound.
- Civils and installation stages – creation of foundations, construction of buildings, installation of plant and services etc.

As the actual items of equipment to be used on site are not known at this stage, typical noise source data for the construction plant have been obtained from *BS5228 Noise and Vibration Control on Construction and Open Sites, 1997* and *Update of Noise Database for Prediction of Noise on Construction and Open Sites, 2005*. These data provide an indication of noise levels from construction plant taken from measurements at various sites.

Predictions have been made for the following two scenarios:

- Site preparation and foundations; and
- Building construction.

In carrying out the assessment, it has been assumed that all plant is operating simultaneously at the closest point to each receptor. This assumption represents a worst-case scenario which could not occur in practice; as in reality construction plant would be distributed around the site at greater distances from receptors, noise levels are likely to be lower than those predicted.

The ‘on-time’ of individual types of plant has been estimated based on experience of similar construction projects. Predictions of construction noise have been made for Receptor 1, 2 and Receptor 3, identified in Section 6.3.2. It has been assumed that there are no barriers between the construction plant and the sensitive receptors, and that the land between receptors and sources is 50% hard ground. The results are summarised in **Table 6.3**.

Table 6.3 Construction Noise Predictions

Receptor	Site Preparation and Foundations (dB LAeq, 1hour)	Building Construction (dB LAeq, 1hour)
Receptor 1	47	40
Receptor 2	68	60
Receptor 3	49	42

Predictions from construction traffic noise

Traffic noise from an individual vehicle consists of two main parts:

- Vehicle engine/exhaust noise; and
- Tyre noise.

In addition, many other sources such as gearbox, cooling fan and bodywork vibrations make a contribution to noise. The overall traffic noise level along a segment of road is influenced by traffic flow, speed and composition (% HGV), road gradient and road surface. The noise experienced by a nearby receptor is dependent upon the separation distance from the road and any intervening ground cover and/or screening.

Generally, changes in traffic noise on existing roads are imperceptible unless they change by 3dB(A) or more, which corresponds to a doubling in traffic volume. It is therefore considered that any change in traffic noise on existing roads will be imperceptible and not significant.

The maximum traffic impact associated with the construction period is forecast to occur during Stage 2. A maximum of 22 HGV movements and 30 to 40 light vehicles per day is anticipated. These movements are considered in terms of the potential effect upon property next to the existing WwTW access road, against a baseline level of no current vehicle movements.

Traffic flows are too low on this road to calculate traffic noise levels using the conventional *Calculation of Road Traffic Noise* (CRTN, Department of Transport, 1988) methodology. Thus, noise levels have been calculated using the BS5228 haul road procedure, based upon the following assumptions:

- a nominal distance to the nearest receptor of 10m from the road has been assumed;
- the speed of all vehicles is 30km/hr; and
- the sound power level of a car is 95dB(A) and a HGV is 105dB(A) derived from a combination of empirical measurement and modelling for other Entec projects.

The maximum traffic levels quoted above of 22 HGVs and 40 light vehicles results in a predicted noise level of $L_{Aeq,1hr}$ 50.6dB at the nearest receptor to the access road.

Mitigation Measures

No specific mitigation measures are required for construction noise. However, standard good practice mitigation measures are proposed to reduce the effects of the development, as detailed in **Table 6.5**. Construction activities will normally be restricted to between 07.00 - 19.00 hours on weekdays.

6.4.2 Predicted Effects during Operation and Incorporated Mitigation

Predictions of noise levels at sensitive receptors have not been undertaken, since the design has not been finalised and no noise emissions data for the new plant is available. As an alternative, this part of the assessment develops an Environmental Noise Criterion (ENC) which can be used to ensure that operational noise levels are acceptable to local residents. Compliance with the ENC will be one of the specifications required to be fulfilled by the contractor appointed to design and build the WwTW.

The most appropriate standard used to determine the ENC is BS4142 *Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas, 1997*. This standard provides a method for determining whether a new noise source is likely to cause noise complaints by comparing the operational noise level (as L_{Aeq} corrected for any distinctive features present) with the measured background level (as L_{A90}). Briefly, the standard proposes that where a noise source is more than 10dB above the background level, complaints are likely; where the noise source is between 5-10dB above the background level, complaints are of marginal likelihood; and where the new noise source is more than 10dB below the background level, complaints are unlikely.

Consequently, to ensure the likelihood of complaints is less than marginal, the ENC has been set so that noise from the proposed WwTW does not exceed the existing noise level at the nearest receptors to the site (i.e. the ENC is set as background noise + 0dB). The existing noise level is taken as the lowest measured night-time L_{A90} . The criteria is based upon measured night-time levels as this is when other ambient noise sources (such as traffic) will be at their lowest level, and thus results in the most stringent of noise limits.

The WwTW noise level would take into account any tonal or other penalty-incurring characteristics of the sound, as described in BS4142. It will be the responsibility of the developer and contractor to ensure suitable plant is selected and installed so that this noise limit is not breached. The appropriate ENC values for Receptor 1, 2 and Receptor 3 are detailed in **Table 6.4**. All ENC levels lie below the 55dB absolute criteria defined in the *Guidance Note for Noise in Relation to Scheduled Activities*.

At Receptor 1, the measured average background noise level was 30dB(A). BS4142 states that it is not suitable for assessing industrial noise when background noise levels are very low, this is defined as below about 30dB. Consequently, the ENC level of 30dB(A) is considered appropriate for this receptor.

Table 6.4 Environmental Noise Criterion (ENC)

Receptor	Lowest Measured Night-Time L_{A90} dB	Environmental Noise Criterion L_{Aeq} dB (lowest background +0dB)
Receptor 1	30.0	30.0
Receptor 2	50.0	50.0
Receptor 3	36.0	36.0

It should be noted that this limit applies only to noise produced by the development itself, since the contractor cannot be held responsible for any future increases in ambient noise due to other sources. The results of the noise monitoring show that ambient noise levels exceeded the ENC on numerous occasions during both the day and night-time. Therefore compliance with the ENC should be ascertained by calculation utilising sound power levels from measured source

data, or alternatively by measurement at the receptor location during periods when other noise sources will not affect the L_{Aeq} measurements.

During operation of the site, traffic levels are predicted to consist of two HGVs per week and two light vehicles per day. In order to assess the worst case, it has been assumed that both HGV movements occur on the same day. As with the construction traffic noise assessment, these movements are considered in terms of the potential effect upon property next to the new access road, but in this instance are assessed against existing noise levels.

Traffic flows are too low on this road to calculate traffic noise levels using the conventional *Calculation of Road Traffic Noise* (CRTN, Department of Transport, 1988) methodology. Thus, noise levels have been calculated using the BS5228 haul road procedure, based upon the same assumptions detailed in Section 6.4.1, in relation to construction noise.

The maximum traffic levels quoted above of two HGVs and two light vehicles results in a predicted noise level of $L_{Aeq,1hr}$ 39.9dB at the nearest receptor to the new access track.

Mitigation Measures

The mitigation that will be incorporated into the operational phase of the proposed development is shown in **Table 6.5**.

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

Table 6.5 Summary of Incorporated Mitigation

Receptor	Predicted Effects	Incorporated Mitigation Measures and Rationale for their Likely Effectiveness
Construction		
Nearby residential properties	Increased noise levels due to construction traffic	Movement of heavy plant on local roads will be kept to a minimum. All deliveries will be controlled by restrictions on routes and operating hours.
	Increased ambient noise levels	<p>Restricted hours of working (08:00 to 18:00 Monday to Friday) to avoid sensitive periods. Any requirement to work outside of these periods will only arise through prior agreement with the planning authority.</p> <p>All construction activities to be undertaken in accordance with good practice as set out in BS5228:1997.</p> <p>All employees on the construction site will be advised of quieter methods of operating plant and tools, and to report any damage to noise control measures as soon as they are identified.</p> <p>Where practicable, for any particular activity, locally available and suitable plant, machinery and working practices will be adopted. All equipment will be maintained in good working order and will be fitted with appropriate noise controls at all times (e.g. silencers, mufflers and acoustic hoods).</p> <p>Construction plant capable of generating significant noise and vibration levels will be operated in a manner to minimise the duration of the higher magnitude levels.</p>
Operation		
Nearby residential properties	Noise generated by WwTW	<p>Mitigation will be incorporated in the design including, if required, complete enclosure of noise-generating equipment to meet the operational noise criteria.</p> <p>Post-commissioning compliance testing will be undertaken to ensure that the ENC at the nearest sensitive receptors is being met.</p>

6.4.3 Implementation of Mitigation and Enhancement Measures

The implementation mechanisms for the identified mitigation measures are given in **Table 6.6**.

Table 6.6 Implementation of Mitigation and Enhancement Measures

Incorporated Mitigation Measures	Responsibility for Implementation	Implementation Mechanism
Construction		

Construction activities to be undertaken in accordance with good practice as set out in BS5228:1997.	Contractor	Contract Documents
--	------------	--------------------

Operation

Compliance with ENC.	Site Designer and Operator	Contract Documents
----------------------	----------------------------	--------------------

6.5 Assessment of Effects

6.5.1 Significance Evaluation Methodology

For both construction and operational noise levels, an excess over the derived noise limits is assessed as a significant effect. Compliance with the derived noise limits is thus judged as a not significant effect.

Construction Noise Effect Criteria

Given the short-term nature of construction noise effects, absolute limits are considered appropriate. The relevant criteria for the assessment of construction noise effects have been taken from *Advisory Leaflet 72 Noise Control on Building Sites* as detailed in **Table 6.7**. These criteria are also applied to construction traffic noise.

Table 6.7 Construction Noise Limits

Time Period	Applicable Noise Limit
Daytime (07:00 - 19:00) $L_{Aeq,12hr}$	70 dB(A)
Evening (19:00 - 22:00) $L_{Aeq,3hr}$	60 dB(A)
Night-time (22:00 - 07:00)	No construction

Operational Environmental Noise Criteria

As operational noise effects are more long term than those associated with construction, noise limits relative to existing background levels are considered appropriate. BS4142 is commonly used as a platform to judge the acceptability of a new noise source. However, in setting ENC levels for the site, which will be enforced by contract, the noise level will be reduced to a level which would be judged acceptable, and thus not significant.

Operational traffic noise levels are also considered in the context of existing noise levels at the receptor considered.

6.5.2 Predicted Effects during Construction and their Significance

Construction Noise

Predicted construction noise levels for both scenarios assessed (**Table 6.3**) are in compliance with the AL72 recommended levels at all three receptors. It should be noted that assumptions made during the calculations mean that the predicted noise levels are ‘worst-case’ and assume that all plant is located at the ‘closest approach’ to the receptor. Therefore actual noise levels are likely to be lower than those predicted.

Worst-case predictions of noise from construction traffic along the WwTW access route of $L_{Aeq,1hr}$ 50.6dB do not exceed the AL72 levels at the receptor. Thus, no significant effects are predicted in terms of construction noise.

6.5.3 Predicted Effects during Operation and their Significance

An ENC has been developed to ensure that noise levels at sensitive receptors do not exceed relevant guidelines. This will be a requirement of the contract specification for the final supplier. This will ensure that noise effects of the WwTW will be controlled to prevent nuisance being caused to local residents. Thus, no significant effects are expected in respect of operational noise.

Operational traffic noise levels at the receptor closest to the new access road are predicted as $L_{Aeq,1hr}$ 39.9dB. The average $L_{Aeq,15min}$ measured at the receptor was 51dB. Given the high margin below the background levels, it is unlikely that traffic noise could present a nuisance. Thus, no significant effects are expected in respect of operational noise.

6.5.4 Cumulative Effects

No cumulative effects have been identified.

6.5.5 Compensation Measures

No compensation measures are required.

6.5.6 Additional Mitigation/Enhancement Measures

No additional mitigation or enhancement measures are required.

6.5.7 Summary of Significance Evaluation

Table 6.8 summarises the significant noise effects arising from construction and operation of the WwTW capacity upgrade.

Table 6.8 Effects and Evaluation of Significance

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
Construction						
Construction - direct site noise	-ve	Likely	Local		Not significant	Complies with AL72 noise limit
Construction - traffic noise	-ve	Likely	Local		Not significant	Complies with AL72 noise limit
Operation						

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
Operation - direct site noise	-ve	Likely	Local		Not significant	ENC set to ensure site no increase over existing background
Operation - traffic noise	-ve	Likely	Local		Not significant	Over 10dB below average ambient level measured
Key:	Type	Probability	Policy Importance	Magnitude	Significance	
	- = Negative	Certain	International	Major	Major Significance	
	+ = Positive	Likely	National	Moderate	Minor Significance	
	? = Unknown	Unlikely	Regional	Minor	Not Significant	
			District	Negligible		
			Local			

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

7. Socio-economics

7.1 Introduction

This chapter addresses the potential social and economic impacts of the Castleblayney WwTW capacity upgrade on residents of Castleblayney Town and County Monaghan.

7.2 Scope and Methodology

7.3 Scope

In order to ascertain the scope of this assessment a Scoping Report was submitted to Monaghan County Council in October 2007. This identified potential effects on the growth of the town and on particular economic sectors.

The Scoping Report indicated that whilst Castleblayney had been in decline for a number of years, recent development levels indicate that it has recovered and is expanding its residential, retail and commercial base. The existing secondary treatment system will not be able to cope with a large increase in influent flows. Thus, if increased capacity is not provided, then future development of Castleblayney Town will be constrained.

The upgrade of the WwTW has the potential to affect the development of tourism based on recreation in and around Lough Muckno given that the treated effluent discharges into a river which flows into it.

7.3.1 Methodology

Construction

A qualitative judgement has been applied to the potential effects during construction using knowledge of the scale and methodology of the construction to be undertaken.

Operation

In order to assess the impacts of the upgraded WwTW during operation, the potential effects on socio-economic factors have been considered against an alternative scenario where the WwTW is not upgraded (i.e. a 'do-nothing' scenario). This assessment is based on the review of the baseline situation and anticipated changes through qualitative judgement.

7.4 Existing Environment

7.4.1 Baseline Information Sources

Baseline information has been obtained from the following sources:

- Castleblayney Town Development Plan (2007 – 2013)
- County Monaghan Development Plan (2007-2013)

- National Spatial Strategy (NSS) (2002)

7.4.2 Existing Situation

The NSS identifies Monaghan as a development ‘hub’ linked with the ‘gateway’ of Dundalk by the N2 National Primary Route between Dublin and Derry in Northern Ireland. Castleblayney is situated on this national transport corridor.

The Castleblayney Town Development Plan (2007 – 2013) reports that, up until recently, Castleblayney has failed to capitalise on its strategic position on the county’s premier N2 route and its close proximity to Northern Ireland. Increasing mobility, declining population levels and a failure to attract significant new industrial investment contributed to the town’s decline in the latter half of the last century. However, recent development levels indicate that the town has recovered and is expanding its residential, retail and commercial base.

Immediately to the west of the WwTW is situated a cattle market, a warehouse and garage. The access track to the WwTW runs through the cattle market. It adjoins the R181 highway (Muckno Street) along which are a number of residential and other commercial properties are situated, to the southwest a number of these properties back onto the WwTW site. Immediately to the south of the WwTW is a variety of commercial units, further beyond is a caravan park.

Lough Muckno is designated in the Castleblayney Town Development Plan as an Area of Prime Amenity Value and is an important and popular location with regard to angling.

7.4.3 Predicted Trends

Development of Castleblayney Town is set to take place based on its key assets; namely its strategic location on a national road corridor and its potential for tourism based on recreation in and around Lough Muckno.

7.4.4 Information Gaps

No information gaps which could reasonably be expected to be collected to aid the assessment have been identified.

7.5 Potential Effects and Incorporated Mitigation

7.5.1 Potential Effects during Construction and Incorporated Mitigation

The potential effects of construction activities on nearby residential receptors are considered separately in Section 5 (air quality); Section 6 (noise and vibration); and Section 11 (traffic). These effects will not be considered further in this section.

It is envisaged that construction will take place in two stages, each 18 months in duration, starting in 2010/2011 and 2020 respectively. Although there are unlikely to be significant opportunities for the employment of local staff in the construction, there are potential economic effects on the area, in terms of increased spending on accommodation and subsistence by the construction workforce.

It is anticipated that any effects will be positive and mitigation is therefore not relevant to this assessment.

7.5.2 Predicted Effects during Operation and Incorporated Mitigation

The WwTW capacity upgrade will impact on employment, population and sustainable development by providing facilities to deal with the wastewater resulting from population and business expansion. It is anticipated that there may be one additional employment opportunity arising from the operation of the WwTW following the Stage 2 capacity upgrade.

There is potential for the WwTW discharge to affect recreational users of Lough Muckno and those that may depend on it for a livelihood (for example, due to tourism) by impacting on water quality. The economy of the area is closely linked to the quality of water within the lough as it is used for canoeing, boating, other water sports, coarse fishing, and bathing (although it is not designated under the EU Bathing Water Directive). In order to avoid adverse effects on Lough Muckno, the final effluent will be treated to meet the effluent standards set out in **Section 9 – Water Quality** which reflect the relevant statutory regulations and provide adequate protection of aquatic receptors given the assimilative capacity of the River Fane.

Table 7.1 Summary of Incorporated Mitigation

Receptor	Predicted Effects	Incorporated Mitigation Measures and Rationale for their Likely Effectiveness
Construction		
Construction industry	Job creation	No mitigation proposed as is expected to have positive economic effects.
Local economy	Increased spending on accommodation and subsistence by the construction workforce	No mitigation proposed as is expected to have positive economic effects
Operation		
Population and businesses within the catchment of the WwTW	Increased provision for expansion of population and employment in accordance with NSS and other plans	No mitigation proposed as this is key to the rationale for development and is expected to be positive
Water-dependent sectors including tourism	Increase in treated effluent discharge leading to deterioration of water quality and failure of mandatory (or guideline) water quality standards. Reduction in the economic value of water-based tourism activities may occur as a result.	High certainty of effectiveness: Design of the wastewater treatment processes to achieve environmentally protective quality standards will prevent any adverse effects in relation to water quality. Further information relating to water quality is presented in Section 9.
Employment market	Job creation	No mitigation proposed as this is expected to have a positive impact on the economy.

7.5.3 Implementation of Mitigation and Enhancement Measures

The implementation mechanisms for the identified mitigation measures are given in **Table 7.2**.

Table 7.2 Implementation of Incorporated Mitigation and Enhancement Measures

Description of measures including any monitoring requirement	Responsibility for implementation	Implementation mechanism
Construction		
No mitigation or enhancement measures are proposed		
Operation		
Design and operation of the wastewater treatment processes to achieve environmentally protective water quality standards.	Site Designer and Operator	Contract Documents

7.6 Assessment of Effects

7.6.1 Significance Evaluation Methodology

The significance of the potential effects has been assessed based on qualitative judgement and with reference to the baseline situation and anticipated trends using the following scale:

- Major Significance
- Minor Significance
- Not Significant

7.6.2 Predicted Effects during Construction and their Significance

It is envisaged that construction will take place in two stages, each 18 months in duration, starting in 2010/2011 and 2020 respectively. Although there are unlikely to be significant opportunities for the employment of local staff in construction, there are potential economic effects on the area, in terms of increased spending on accommodation and subsistence by the construction workforce.

During the construction, the existing WwTW will continue to treat wastewater from Castleblayney to the required standards and thus no potential effects on water dependant economies are identified.

7.6.3 Predicted Effects during Operation and their Significance

The capacity upgrade of the Castleblayney WwTW will provide wastewater treatment for an increased population and an increase in industrial and business activity. This will result in economic benefits by not restraining growth. Without this wastewater treatment provision, development will be constrained and the local and regional economy will not be able to develop as is hoped for, as set out in a number of national, regional and local planning documents.

The result of the water quality assessment (Section 9) indicates that there will be no significant, adverse effects on water quality and therefore it is considered that no significant, adverse effect on water based economies will occur.

It is anticipated that there may be one additional employment opportunity arising from the operation of the WwTW following the Stage 2 capacity upgrade. However, this is not significant when compared to the wider town and regional job market.

7.6.4 Cumulative Effects

The provision of the increased wastewater treatment capacity will contribute towards development of the local and regional economy. Other infrastructure developments and adherence to policies contained in relevant planning documents will be cumulative in their beneficial effect.

7.6.5 Compensation Measures

No compensation has been identified.

7.6.6 Additional Mitigation/Enhancement Measures

No additional mitigation or enhancement measures have been identified.

7.6.7 Summary of Significance Evaluation

Table 7.3 summarises the significant socio-economic effects arising from construction and operation of the WwTW capacity upgrade.

Table 7.3 Effects and Evaluation of Significance

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
Construction						
Increased employment opportunities in the construction industry	+ve	Likely	Regional	Minor	Not significant	The number of new construction jobs is expected to be small
Maintenance of increased construction workforce in the area.	+ve	Likely	Local	Minor	Not significant	Spending on accommodation and subsistence by the construction workforce is expected to be small
Operation						
Increased capacity will allow for growth of the economy in Castleblayney.	+ve	Likely	Regional	High	Major	The WwTW will contribute towards the sustainable development of Castleblayney Town.
Deterioration of water quality leading to poorer conditions for water based economies	+ve	Likely	Local	Minor	Not significant	Water quality assessment (Section 9) indicates that no significant effects will occur and that water based activities will not be affected.

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
Increased employment	+ve	Likely	Local	Negligible	Not Significant	There may be some employment opportunities although they will not be significant compared to the wider town/county employment market
Key:	Type	Probability	Policy Importance	Magnitude	Significance	
	- = Negative	Certain	International	Major	Major Significance	
	+ = Positive	Likely	National	Moderate	Minor Significance	
	? = Unknown	Unlikely	Regional	Minor	Not Significant	
			District	Negligible		
			Local			

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

8. Landscape and Visual

8.1 Introduction

This chapter provides a description of the existing (baseline) landscape resource and visual amenity within a defined study area of 1km radius of the development site. The baseline forms a cornerstone of the assessment process, establishing the context and sensitivity of receptors within the defined study area. Potential effects resulting from the construction and operation of the proposed development on the existing landscape and visual resource, including individual landscape elements, landscape character, landscape designations and visual receptors within the vicinity of the site are then assessed in the context of the landscape and visual baseline to identify those that are considered significant.

8.2 Scope and Methodology

8.2.1 Scope

The study area for this assessment has been defined using a combination of desk and field studies to identify key landscape elements, landscape designations, landscape character, key views and visual context. The extent of the study area has been drawn to include those areas that are likely to be affected by the proposed development as a result of changes to the landscape character or existing views.

For the Castleblayney WwTW capacity upgrade, a preliminary 2km study area surrounding the development site was selected to inform the initial assessment. Following an initial site survey, for the purpose of this assessment, the study area has been refined to a 1km radius around the site, as illustrated on **Figure 8.2**.

For the purpose of this assessment, the development and areas within it will be referred to as:

- The development site – all land within the redline boundary shown on Figure 8.2;
- The main access route – land within the red line boundary to the north of the existing WwTW and joining Muckno Street (R181);
- The extension area – land within the redline boundary to the southwest between the existing WwTW and the Caravan Park to the south;
- The existing WwTW – land within the redline boundary to the east of Muckno Street and is currently occupied by the buildings and infrastructure of the existing WwTW.

For the purposes of this assessment it has been assumed that the proposed buildings will be approximately 9m and in keeping with the existing buildings. The proposed odour stack, constructed as part of the Stage 2 works (located within the existing WwTW area) will be approximately 20m in height and proposed odour control scrubbers will be approximately 11m in height.

The assessment process began at scoping stage with desk research and field survey. This utilised available maps and planning documents along with an assessment of the site and area to provide an initial understanding of the landscape character and visual receptors. This information

resulted in the culmination of the Scoping Report prepared by Entec and issued in October 2007 outlining the scope of this assessment.

8.2.2 Methodology

The methodology for undertaking this assessment is based on the industry standard ‘The Guidelines for Landscape and Visual Impact Assessment, Second Edition’ (The Landscape Institute and Institute of Environmental Managers, published 2002). Regard is also given to the guidelines for ‘Landscape and Landscape Assessment’ (Department of the Environment and Local Government, 2002). The landscape and visual assessment was prepared according to a methodology developed by Entec based upon the above referenced guidelines.

The assessment will consider changes to the elements of the existing landscape and the visual amenity of those living, visiting, working and travelling within the surrounding area and who may potentially have views of the proposed development. Our approach is to treat changes and their effects on landscape and visual amenity separately:

- Landscape effects: consisting of changes in the fabric, character and quality of the landscape resulting from the proposed development; and
- Visual effects: resulting from changes in views and visual amenity of people who have (or will have) views of the proposed development.

There are many terms that are used in a landscape assessment that are based on the term “landscape”, which the Landscape Institute (LI) defines as ‘the whole of our external environment’. These individual terms will be referred to throughout this assessment and include the following:

- Landscape Elements: These are the physical components within the landscape. The LI defines them as ‘the individual elements that make up the landscape including prominent or eye-catching features such as hills, valleys, woods, trees and hedges, ponds, buildings and roads’;
- Landscape Character: The combination of the landscape elements, patterns, quality, scale, landform and land-use which make an area distinctive from another and creates a ‘sense of place’;
- Landscape Designation: These are areas of land that are acknowledged as making a special contribution to the overall landscape character or visual quality of a locality. Provision for identifying and protecting such areas deemed to be of national importance is made in law and these are known as statutory landscape designations. Areas of regional or local importance are identified at the local level (usually by the local planning authority) and are known as non-statutory landscape designations;
- Landscape Quality: The state of repair or condition of the elements of a particular landscape, its integrity and intactness and the extent to which its distinctive character is apparent. The quality of a landscape element or characteristic may also be influenced by the degree to which it may contribute to the overall landscape character, its rarity and potential for replacement or mitigation;
- Landscape Value: The importance attached to a landscape, often as a basis for designation or recognition, which expresses national or local consensus, because of its quality, cultural associations, scenic or aesthetic characteristics. It should be noted that a landscape of high value may not always equate to areas of high landscape quality (particularly if they are designated for other landscape and visual

reasons) and that areas of low landscape value may contain areas of higher landscape quality;

- Landscape Capacity: The capacity of a particular type of landscape to absorb change without unacceptable adverse effects on its character;
- Landscape Sensitivity: This is derived from consideration of the existing landscape in terms of landscape quality value and capacity and is classified as high, medium or low; and
- Cumulative Landscape Effects: These are defined by the LI as resulting from additional changes to landscape amenity caused by the proposed development in conjunction with other development (associated or separate from it), or actions that occurred in the past, present or are likely to occur in the foreseeable future²⁴.

Landscape and visual issues are assessed separately under the following broad criteria:

- Landscape effects:

These consist of changes in the fabric, character and quality of the landscape that are predicted to result from any development. They include physical changes to landscape elements and character of the area within which the proposed development is located, in addition to indirect effects on landscape character in the surrounding area associated largely with visibility of the proposed development. The assessment of landscape effects will also assess potential effects on landscape designations.

- Visual effects:

These are a subset of landscape effects and are concerned wholly with the effect of the proposed development on views and general visual amenity available to people living, working, enjoying recreational activities, or travelling through, in and around the proposed development. Changes in views may occur through obstruction, intrusion or alteration.

Potential effects may be adverse or beneficial, permanent or temporary and in this case, occur during either the construction or operational phases.

Landscape

Landscape Receptors

The introduction of the extension area will have *indirect* and *direct* effects on the landscape, with *indirect* effects being those which affect the landscape character and *direct* effects those which physically modify landscape elements. Three aspects of the landscape resources are considered, with these being identified through desktop study:

- On-site landscape elements which may experience *direct* physical effects;
- The contextual patterns and dynamic of development and broad scale characteristics found throughout the study area which may be *indirectly* affected through the WwTW capacity upgrade and are encompassed in the grain of the landscape; and

²⁴.Guidelines for Landscape and Visual Impact Assessment, Second Edition (GLVIA), Landscape Institute and the Institute of Environmental Management and Assessment (IEMA), 2002. Page 85

- The landscape character types which have been identified in the baseline that apply to parts of the study area and which may be indirectly altered through the WwTW upgrade.

The landscape effects will be assessed by consideration of three criteria: type of effect; the sensitivity of the landscape resource; and the predicted magnitude of change. Consideration of the sensitivity of the landscape resource against the magnitude of change posed by the development is fundamental to landscape assessment and these two criteria are defined in more detail later in this section.

Types of Landscape Effect

The effect of the proposed development on each identified landscape receptor is classified according to its ability to accommodate the consequent effects of the construction, operation and de-commissioning of the proposed development. This ability is expressed using the following definitions:

- Positive where it is felt to complement or contribute to the landscape, strengthening it or adding positive characteristics and qualities which were not previously available;
- Neutral where it neither contributes to nor detracts from the landscape, and can be accommodated comfortably by the landscape context;
- Negative where it introduces elements which are not currently found in the landscape and cannot be accommodated without some detrimental effect.

The ability of landscape receptors to accommodate the proposed development is assessed through professional judgement based on the factors considered in the evaluation of the sensitivity of receptors and the magnitude of the effects and on the knowledge of the study area as a whole which the assessors have gained. The significance of the effect of the proposed development on each of these landscape receptors is assessed through a combination of their sensitivity and the magnitude of the change that they will experience.

Magnitude

The magnitude of change is an expression of the degree of addition, change or loss which would be experienced by the baseline landscape conditions and is classified as high, medium, low or negligible.

The following factors are considered in the evaluation of magnitude of change:

- The nature of the perceived contrast, or integration, of any new features or changes with the existing landscape including the nature of the development site layout;
- The scale of change in the landscape with respect to the proportion of the landscape affected by the development site and the degree to which it is affected; and
- The duration and reversibility of the effect on the landscape.

The manner in which these conditions are reflected in the magnitude categories used in the assessment are indicated in **Table 8.1**, although it is recognised that for some developments in certain locations there may be combinations of factors that do not comply with the range of effects set out in the table. In these situations professional judgement has to be made concerning the definition of the level of landscape effects.

Table 8.1 Magnitude of Landscape Effects

Predicted Landscape Effects	Level
Large-scale changes in landscape character over an extensive area/intensive, irreversible change over a more limited area/complete loss of notable features or elements	High ↓
Moderate scale changes over a localised area/partial loss/alteration of notable features or elements	Medium ↓
Little change in any landscape feature	Low

Sensitivity

The sensitivity of each landscape receptor is dependant on its values and its ability to accommodate the proposed development, and is classified as high, medium or low. This classification is derived from consideration of a number of variables:

- Landscape quality: an appraisal of the state of repair or condition of landscape elements, the integrity and intactness of the landscape, and the extent to which its distinctive character is apparent in a particular area.
- Landscape value: an appraisal of the importance of the landscape, with consideration given to any national and local designations which may apply, the perceived value of the landscape to users and other consultees, and any intrinsic aesthetic characteristics of the landscape such as scenic quality or sense of place. These may be derived from literature, films, television programmes and guides. It should be noted that a landscape of high value may not always equate to areas of high landscape quality (particularly if they are designated for other landscape and visual reasons) and that areas of low landscape value may contain areas of higher landscape quality.
- Development within the landscape: the ability of the landscape to accommodate the proposed development can be influenced by the presence and extent of any existing development within the study area, especially in cumulative views. Landscapes which are already influenced by development similar in some way to the type proposed generally have a greater capacity to accommodate the proposed changes, while those lacking any influence from built form or other human elements may be more susceptible. In this assessment the evaluation of the sensitivity of landscape receptors does assume knowledge of the nature of the development proposed.
- Scale of the landscape: this also affects the ability of the landscape to accommodate the proposed development. A large scale landscape of similar landform generally has a greater capacity to absorb development than a smaller scale, complex setting where misleading comparisons of scale may occur.
- Visibility: whilst visibility is primarily a visual concern, the extent of enclosure and variation in topography has a role to play in determining the sensitivity of a particular landscape to change.

The manner in which these considerations are evaluated to derive a sensitivity category is set out in **Table 8.2**. Nevertheless it is recognised that the categories can only be considered as indicative and there may be situations where due to specific circumstances and the associated

need to apply professional judgement result in alternative landscape resource sensitivities being used in an assessment.

Table 8.2 Sensitivity of Landscape Resources

Landscape Resource Categories	Sensitivity
Important landscapes or landscape components of particularly distinctive character likely to be vulnerable to relatively minor changes	High ↓
Moderately valued characteristics reasonably tolerant of change	Medium ↓
Landscape of low importance or relatively immature or damaged landscapes tolerant of substantial change	Low

Visual

Visual effects are recognised by the Landscape Institute as a subset of landscape effects and are concerned wholly with the affect of the development on views, and the general visual amenity. Visual effects may include the following:

- Visual obstruction – physical obstruction or blocking of a view, only likely to occur close to the development or within the application site boundary.
- Visual effect – a change in the appearance of the landscape as a result of development appearing in an existing view or the loss of particular landscape elements or features already present in the view.
- Other visual effects – The overall visual amenity of an area may be affected to the extent that the visual appearance of a particular landscape character type of the visual setting, ‘sense of place’²⁵ or of a particular location such as a village is significantly changed. Effects on areas of general amenity are considered in the context of landscape change and may also be either negative or positive.

Visual Sensitivity

The sensitivity of each view or route is classified as high, medium or low through consideration of:

- Visual quality: an appraisal of the quality of the view available to the visual receptor(s) relating to its amenity and its integrity and intactness;
- Visual value: an appraisal of the importance given to the view, as indicated by factors such as its recognition as a tourist viewpoint with facilities provided for its enjoyment or its location within an area covered by a landscape designation.

Based on the *Guidelines for Landscape and Visual Assessment, Second Edition*, (The Landscape Institute and Institute of Environmental Management and Assessment, 2002), the different receptor categories identified in the baseline assessment are ranked in order of their sensitivity to visual effects as set out in **Table 8.3**. It should be stressed that this table is indicative only as it would be impossible to rigidly tabulate sensitivity to change.

²⁵ ‘Sense of place’ the essential character and spirit of an area or *genius loci*.

Table 8.3 Sensitivity of Visual Receptors

Visual Receptor Categories	Sensitivity
Residential communities (towns, villages & hamlets)	High
Private residential properties	Medium
Isolated private residential properties	↓
Designated long distance footpaths	↓
Other Public Rights of Way (PRoWs)	↓
Public and private recreational open space	↓
Rights of way associated with highways	Low
Businesses and industry	

Magnitude of Change

The magnitude is described as high, medium, low or negligible, to take account of possible landscape changes, which may affect the view. The magnitude and scale of visual change is described by reference to:

- The scale of change in the view and the loss or addition of features in the view and changes in the composition and extent of view affected. The scale of the development relative to its landscape setting may be more or less emphasised by the presence or lack of scale indicators;²⁶
- The degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in term of mass, scale, colour and texture;
- The distance between the visual receptor and the development and the frequency and ease with which the development may be viewed from a particular viewpoint taking into account seasonal factors such as weather conditions, etc;
- The angle of the main direction of the view and whether the development would be viewed against the skyline or a background landscape;
- The duration, whether temporary or permanent, intermittent or continuous; and
- The potential for indirect effects. The Landscape Institute defines these as effects that are not a direct result of the development, but are often produced away from it or as a result of a complex pathway. An example may include the potential for visual effects as a consequence of increased traffic levels generated by vehicles during the construction period.

Visual assessment considers the above factors, together with the mitigation incorporated into the design, to arrive at a judgement on the sensitivity of the view and magnitude of change posed by the development. General guidance for this assessment has been provided in **Table 8.4** which provides examples of how different considerations interact to produce different visual magnitude categories.

²⁶ Scale indicators are familiar objects in the landscape such as buildings which appear in close proximity to the development site and provide an indication of the true scale and height of the development.

Table 8.4 Visual Magnitude

Visual Magnitude Categories	
High	A major change, obstruction of a view or intrusion into a view that is directly visible and likely to appear in the foreground.
Medium	A moderate change or partial view of a new element within the view which may be readily noticed, directly or obliquely visible including glimpsed or intermittent views and appearing in the middle ground partly screened or mitigated.
Low	A low level of change, affecting a small part of the view which may be obliquely viewed or partly screened and or appearing in the background landscape. May include travelling views from roads/rail.
Negligible	Receptors affected by a small or intermittent change to the view which may be obliquely viewed and mostly screened and or appearing in the distant background or viewed at high speed over short periods and capable of being missed by the casual observer.

Types of Visual Effect

Landscape and visual effects may be positive, neutral, or negative. A positive effect would require development to add to the landscape value, quality, character and or visual amenity of an area. Certain types of development and mitigation associated with some developments such as enhancement of vegetation and the improvement of landscape features could also be regarded as positive.

A neutral landscape and/or visual effect would constitute ‘negligible change’ to the existing landscape or view, and would include changes which may be considered as part of the ‘normal’ landscape processes (such as harvesting) or a negligible magnitude of change affecting a view.

A negative effect may include the loss of landscape elements such as stone walls and hedgerows as part of construction, although usually these types of effects can be avoided.

8.3 Existing Environment

8.3.1 Baseline Information Sources

A description of the existing (baseline) landscape resource and visual amenity²⁷ forms the cornerstone of the assessment process; establishing the landscape and visual context and sensitivity of the defined study area to the proposed development. The existing environment includes reference to the existing landscape character and quality or condition of the landscape and landscape elements on the site and within the surrounding area, as well as general trends in landscape change across the defined study area.

The visual envelope takes into account the surrounding topography and screening elements including areas of woodland, tall mature hedgerows, the existing WwTW and the proposed development itself. The visual envelope is illustrated in **Figure 8.3** and includes photograph locations. The photographs are representative of the extent of visibility and views from key receptors within the study area, these are illustrated in **Figure 8.1**.

The following are sources of information referred to for the preparation of this assessment:

²⁷ Visual amenity as defined by the Landscape Institute ‘*The value of a particular area or view in terms of what is seen*’ and not the more general term.



Photo 1: Looking north west towards the site from Black Island picnic area.



Photo 2: Looking north west towards the site from Black Island bridge.

Castleblayney WwTW
Environmental Impact Assessment

Figure 8.1
Photo Sheet 1 of 6

November 2007
19925-L03.cdr sampr

Entec



Photo 3: Looking south west from the north east boundary towards Muckno Street across the existing WwTW.



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

Photo 4: Looking north east from the north east of the proposed extension area onto Black Island.

Castleblayney WwTW
Environmental Impact Assessment

Figure 8.1
Photo Sheet 2 of 6

November 2007
19925-L04.cdr sampr

Entec



Photo 5: Looking southwest towards Muckno Street (R181) from the middle of the proposed extension area.



Photo 6: Looking southeast towards the site across the area of the proposed new access road.

Castleblayney WwTW
Environmental Impact Assessment

Figure 8.1
Photo Sheet 3 of 6

November 2007
19925-L05.cdr sampr

Entec

Existing WwTW



Photo 7: Looking west towards the site from public footpath on Black Island.



Photo 8: Looking north from Black Island access road across derelict caravan site towards proposed extension area.

Castleblayney WwTW
Environmental Impact Assessment

Figure 8.1
Photo Sheet 4 of 6

November 2007
19925-L06.cdr sampr

Entec

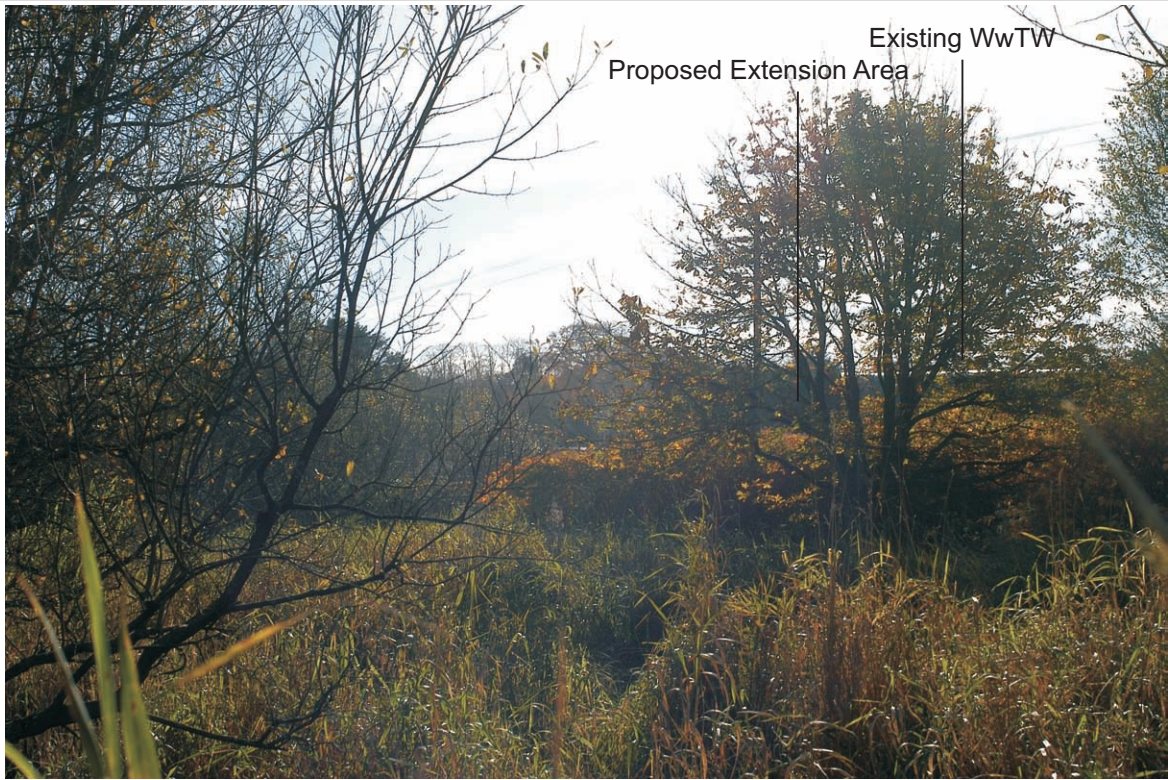


Photo 9: Looking south towards the site from an access road just off Muckno Road (R181).



Photo 10: Looking north from Hope Castle towards the site.

Castleblayney WwTW
Environmental Impact Assessment

Figure 8.1
Photo Sheet 5 of 6

November 2007
19925-L07.cdr sampr

Entec



Photo 11: Looking south east from Mindszenby Park towards the site and Black Island.



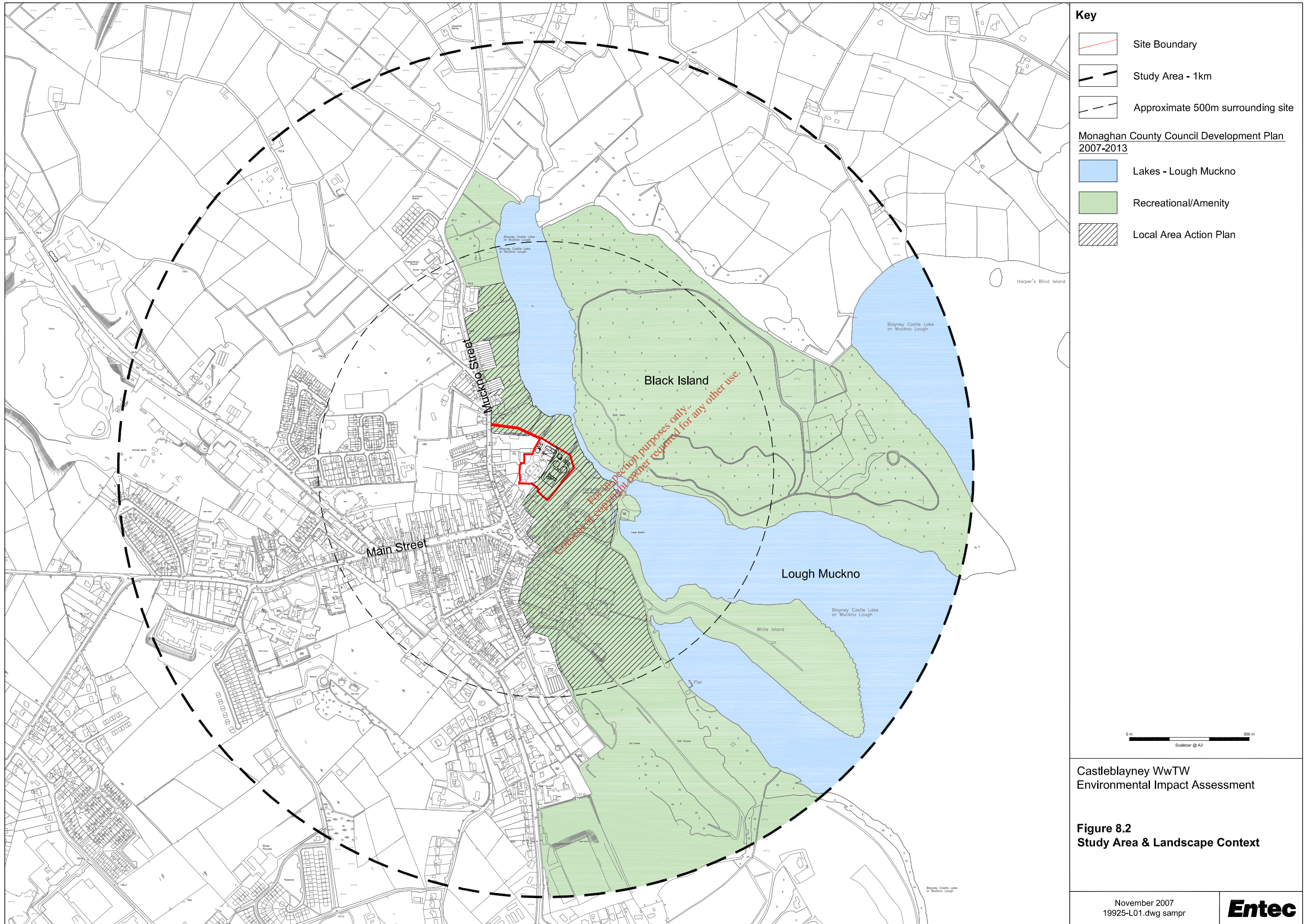
Photo 12: Looking south from R181 across the north part of Lough Muckno towards the site.

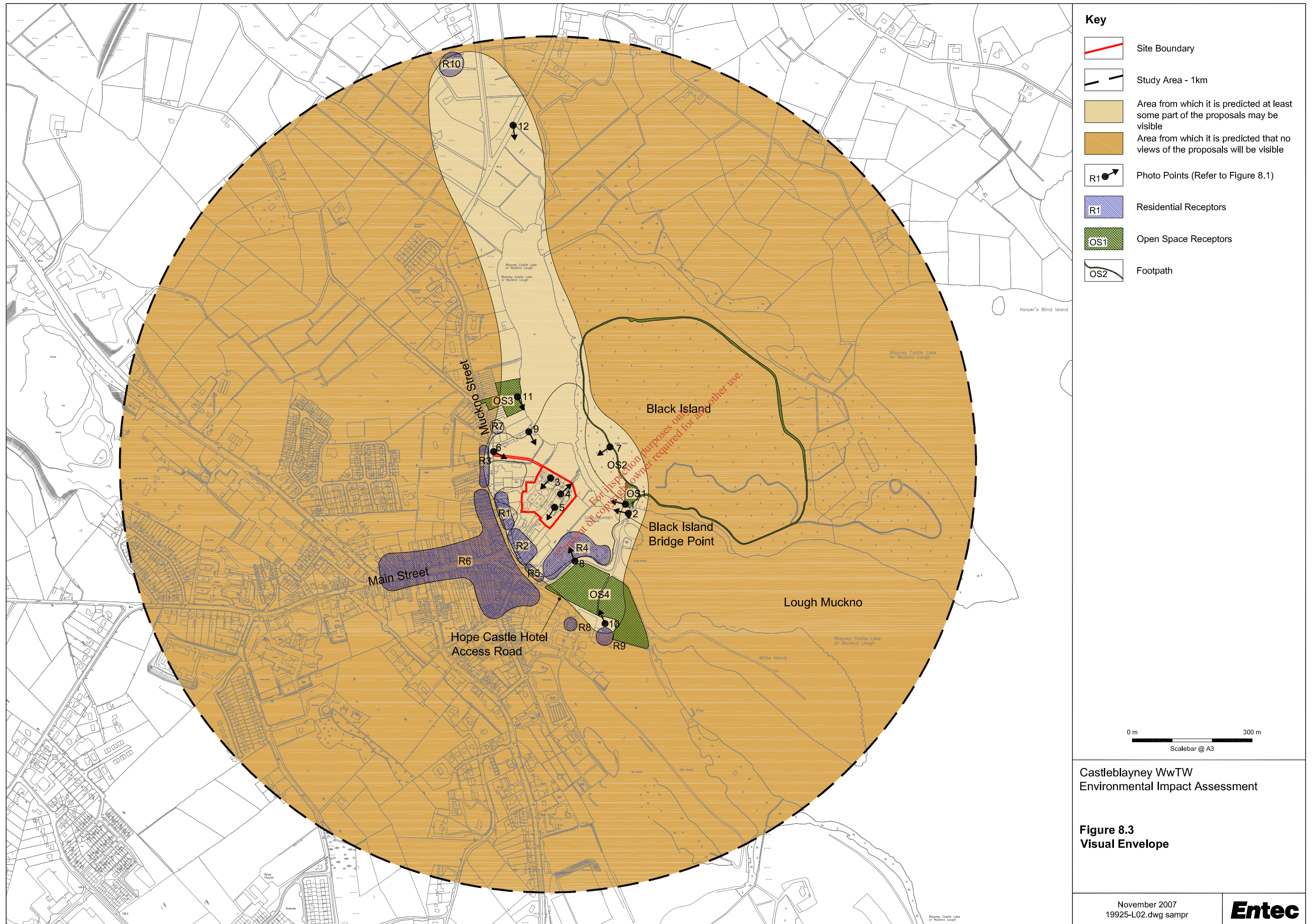
Castleblayney WwTW
Environmental Impact Assessment

Figure 8.1
Photo Sheet 6 of 6









November 2007
19925-L08.cdr sampr

Entec





Key

-  Site Boundary
-  Study Area - 1km
-  Area from which it is predicted at least some part of the proposals may be visible
-  Area from which it is predicted that no views of the proposals will be visible
-  Photo Points (Refer to Figure 8.1)
-  Residential Receptors
-  Open Space Receptors
-  Footpath

0 m 300 m
 Scalebar @ A3

Castleblayney WwTW
 Environmental Impact Assessment

Figure 8.3
Visual Envelope

Based upon the Ordnance Survey Map with the permission of the Controller of Her Majesty's Stationery Office. © Crown Copyright. Entec UK Ltd. AL100001776.

- The Landscape Institute and Institute of Environmental Management and Assessment, (2002), *Guidelines for Landscape and Visual Impact Assessment: Second Edition*, Spon Press, London.
- Nicholas O’Dwyer and Entec, (2007), Castleblayney Sewerage Scheme – Environmental Impact Assessment - Scoping Report.
- Monaghan County Council Development Plan (2007-2013)
- Draft County Monaghan Landscape Character Assessment, October 2007.
- Ordnance Survey Ireland Data
- Field Studies carried out on 7th November 2007

8.3.2 Existing Situation

Site Location and Landscape Context

The development site is situated within Castleblayney town in Monaghan County, as shown in **Figure 8.2**. The site is located within the eastern edge of Castleblayney town; to the east of Muckno Street (R181) and to the west of Black Island and Lough Muckno. Situated within a rural-urban setting, the site is bound to the east by a rural landscape comprising woodland, waterbodies and their associated vegetation; and to the west by the built form of Castleblayney settlement.

The existing WwTW is situated to the east of a cattle market and residential properties. Access to the existing site is gained through the cattle market via Muckno Street. The existing WwTW is surrounded by mixed type of fencing, including concrete post and wire, steel palisade and wire mesh fencing. The north and south east boundaries are further reinforced by tall conifers and a mix of large trees. To the west, the WwTW is screened by a large industrial unit located adjacent to the west of the site, the cattle market and buildings along Muckno Street.

The proposed development site is located directly adjacent to the southern boundary of the existing WwTW. The proposed development site is bordered to the northeast by the banks of a small watercourse that links the northern lake to the Lough Muckno. The banks of the watercourse and lakes are largely vegetated with dense reed beds that merge into the surrounding woodland and scrub vegetation. The proposed extension area is currently undeveloped with marshy unmanaged grassland dominating a large proportion of the area. Lines of native, deciduous trees and shrubs border the site to the south, west and north; and an old field boundary, comprising of deciduous trees and shrubs runs through the middle of the extension area. To the south of the extension area is a caravan park that is currently unoccupied and comprises hardstanding, overgrown grassland, scrubland and rubble.

The new access road will link the north corner of the existing WwTW to Muckno Street further north from the existing entrance. The proposed route runs across two fields of scrubland, crossing an existing ditch that divides the fields.

Landscape Planning Designations

Located within Monaghan County Council, the site is covered by the Monaghan County Development Plan (2007-2013). The following planning policies are taken from the Development Plan and are of relevance to the landscape and visual section of this report:

Landscape Policies:

ENV 3: Sustain, conserve, manage and enhance the landscape diversity, character and quality of the County for the benefits of current and future generations.

ENV 4: Zone important landscape features and elevated lands within settlements as Local Landscape Policy Areas (LLPAs), to ensure that developments do not detrimentally impact on the amenity of the landscape nor on the natural setting of settlements.

Policies for the protection of trees and hedgerows:

ENV 17: Protect trees and hedgerows from development that would impact adversely upon them.

ENV 18: Preserve trees and/or groups of trees that form significant features in the landscape or have particular importance in setting the landscape character of an area or which contribute to the biodiversity of the area (Appendix 3, Trees of Special Amenity Value).

ENV 19: Ensure that existing mature trees, woodlands and hedgerows are, as far as is practicable, preserved and incorporated into any new developments or where removal is unavoidable are replaced by new native planting.

ENV 20: Seek to increase existing coverage, in conjunction with new development and encourage the establishment of native species.

ENV 21: Where trees and/or hedgerows along a public road are set back/removed in order to provide sightlines for a new access, a new hedge containing natural species will be planted behind sight lines.

The Monaghan Way (allocated pedestrian/cyclist path) lies within the study area and provides a route for pedestrians and cyclists that connect the towns within Monaghan County. However, there are no specific policies relating to this route under the Development Plan.

The Monaghan Way Walking Trail has been waymarked by Monaghan Way Walks Ltd and has been approved by the National Waymarked Ways Committee.

Landscape Character

At the time of carrying out this assessment, a draft Landscape Character Assessment (LCA) for the county had been undertaken and was available to the public for comment, though it had not been officially published.

The study area is located within the Landscape Character Area 7 - *Ballybay Castleblayney Lakelands*. The key characteristics of this LCA that are applicable to the local landscape context of the study area are:

- Low lying pastoral landscape with frequent widely spaced drumlins.
- Numerous loughs, some of which are substantial in size and are among the largest in the county.
- Regional road route follows the line of the low lying channel in an east west orientation and links the towns of Ballybay and Castleblayney.
- Rivers and smaller watercourses follow an east west orientation and frequently link the loughs.

Local Topography

The site is situated within a Drumlin landscape and is a key determinant of the local landscape character and visual amenity. The topography within the site is predominantly flat but slopes slightly down towards the water channel to the northeast. The land rises along the southwest boundary of the proposed derelict site towards the adjacent buildings of Muckno Street.

The majority of the landform within the immediate surrounding of the site is flat; sloping gently down towards the water channel and lake. East of the water channel, steep slopes then form the hills where Black Island and Hope Castle are situated. The location of Lough Muckno and subsidiary lake form a long open, flat channel between the adjacent rolling topography. To the west the topography begins to rise towards the western edge of Castleblayney where the landform becomes more undulating.

Settlement Pattern

The settlement pattern within the study area is dominated by the former market town of Castleblayney which spreads out along the Main Street and Muckno Street. The central part of the town has a higher building density. However built form becomes more dispersed towards the outskirts of the settlement. To the east of Castleblayney, there is no built development, although there are a few individual properties located to the northeast of Black Island.

Infrastructure

The local road network associated with Castleblayney link predominantly to the centre of town. Main Street and Muckno Street form the two major roads within the study area with Muckno Street providing existing access into to the WwTW. A series of minor roads lead off from these main roads to connect to the more remote residential areas surrounding Castleblayney with some single-use tracks linking to individual properties.

Land Use

The proposed development site comprises the existing WwTW and rough grassland within the proposed extension area. The existing WwTW consists of low-height treatment tanks and associated buildings surrounded by hardsurfacing for access. Within the proposed extension area the land comprises marshy grassland and scrub vegetation that is unmanaged and divided by strips of hedgerow and tree vegetation.

Within the study area the land use is a mix of rural and urban development, with Castleblayney dominating a large part of the area to the west. Castleblayney has a compact town centre that becomes dispersed towards the outskirts with a network of associated roads linking to the centre. The land use within Castleblayney is a mix of residential, commercial and industrial, all of which are interspersed within the built form of the town.

To the north and south of Castleblayney town the land comprises agricultural farmland. The east of the study area is predominantly agricultural farmland with large waterbodies including Lough Muckno and associated water channels. Black Island is a large area of coniferous woodland located adjacent to Lough Muckno; to the northwest of this are large, irregular size agricultural fields.

Vegetation

Within the existing WwTW the vegetation is sparse and confined to the boundaries of the site. The northern boundary of the WwTW is bordered by a line of coniferous trees, including some vegetation around the entrance of the site. The southern and western boundaries of the existing

WwTW comprise dense bands of mixed vegetation including semi-mature deciduous trees and hedgerows.

The majority of the proposed extension area comprises of marshy grassland and shrubs with denser woodland vegetation located to the south and southwest of the site. A large area of Japanese Knotweed is situated within the western corner of the extension area adjacent to a band of deciduous trees and dense shrubs. Three field boundaries are located within the extension area; two of which border the area to the northwest and southeast and the third which divides the site down the centre. These boundaries are formed by hedgerow species and trees and consist of a mix of semi-mature vegetation along with broken sections of dying species. These areas require habitat and hedgerow management to retain the value of the vegetation.

The site is surrounded to the north, east and south by scrub vegetation and reed bed vegetation associated with the adjacent water channel and Lough Muckno. The reed beds surround the majority of the waterbodies and merge into grass and woodland vegetation. Black Island is densely vegetated woodland of coniferous species and shrub undergrowth; and is surrounded by open fields and associated hedgerow vegetation to the north. To the south of the site the former caravan park is an open area of scrub grassland bound to the south by a band of mixed deciduous and coniferous trees. The landscape surrounding Hope Castle Hotel, located to the south of the site encompasses a large open area of maintained grassland and a formal line of semi-mature deciduous trees. The area to the southwest of Lough Muckno, including White Island, comprises a mix of unmanaged grassland and scrub vegetation with clusters of mixed, native deciduous trees.

Vegetation surrounding the outskirts of the study area is predominantly associated with agricultural farmland, arable fields divided by mature native mixed hedgerows with some groups of woodland sporadically situated across the landscape.

Public Rights of Way

There are no designated Public Rights of Way or Cycle Routes within the development site or study area. The closest pedestrian route within the study area is around Black Island; which follows the base of the hill within the woodland around the island. The Monaghan Way passes through the study area and provides a pedestrian and cycling route that connects from surrounding settlements to Castleblayney. The Monaghan Way is a long distance waymarked walking trail that covers a large part of Monaghan County from Monaghan town to Iniskeen and passes through Castleblayney.

Estimated Visual Envelope

The predicted extent of visibility for the proposed development is influenced by the location, type of native vegetation, built form and the landform surrounding the proposed development site. This is illustrated in the estimated visual envelope, refer to **Figure 8.3**. Within the study area, the vegetation is one of the key determinants of its predicted visibility; the site surrounded by a series of vegetation blocks that provide a staggered layering which screens both the existing and proposed development site from surrounding receptors. The built form of Castleblayney restricts anything further than immediate views onto the development. Due to the topography and vegetation it is anticipated that the visual envelope will be restricted to within 1km of the development site.

It is estimated that activity during the construction and operation phases of the proposed development site will be largely screened by existing vegetation surrounding the site. However, cranes associated with the construction of the odour stack and scrubber, and the operation of the stack and scrubbers, will affect the views and visual amenity of a number of receptors surrounding the site. Subsequently, the extent of visibility of the proposed development will be

dependant on the surrounding landform, built form and vegetation, and the introduction of vertical elements within existing views skyline views.

Potential Landscape Receptors

Potential landscape receptors within the study area are identified in **Table 8.5**.

Table 8.5 Potential Landscape Receptors

Receptor Id	Receptor type	Approximate distance from development site extension area (metres)
Loss of site vegetation within the proposed extension area. The area comprises predominantly marshy grassland with field boundary vegetation and a water channel with associated vegetation.	Vegetation	0m
Loss of site boundary vegetation – hedgerows and trees to be removed. Boundary vegetation along the north and south of the proposed extension area, consisting of native hedgerow species and trees.	Vegetation	0m
Loss of vegetation along the proposed site access road. Currently comprising fields of scrubland vegetation which will be removed to accommodate the road.	Vegetation	0m
Changes to the landform to provide a stable platform for the proposed development. Earthworks to the existing landform to minimise flooding of the site, including underground drainage of the site.	Landform	0m
Alteration to the water ditch for bridging point of the proposed site access road. This will involve implementation of concrete channel and include removal of vegetation associated with the ditch.	Waterbody	0m
Alteration to the landscape pattern through development of the extension area. The development of a currently vegetated area to accommodate the extension area proposals.	Landscape Pattern	0m
Landscape Character Area		
Changes to the Ballybay & Castleblayney Lakelands LCA	Local Landscape Character	0m

Potential Visual Receptors

Potential visual receptors within the study area are indicated on **Figure 8.3** and described in **Table 8.6**.

Table 8.6 Potential Visual Receptors

Receptor Id	Receptor Category	Approximate distance from development site extension area (metres)	Type of view
R1 – Muckno Street (R181) housing directly west of the site.	Residential	20m W	Situated to west of the development site, this group of receptors have partial views of the existing WwTW site filtered through intervening built form and trees. The majority of available views are from the first floors of the properties with long views across to Black Island where the coniferous woodland dominates the skyline.
R2 – Muckno Street housing southwest of the site.	Residential	40m SW	These residential receptors currently experience partial views of the existing site from second storey windows filtered through dense vegetation bands to the southwest of the development site.
R3 Muckno Street housing west of the proposed access road entrance.	Residential	5m W	These receptors have open views of the existing site with views of rough grassland to the foreground.
R4 – Former Caravan Park.	Residential	30m S	The caravan park is currently not in use, however, should the area become active, temporary visitors would have partial views of the site filtered through existing hedgerow and tree vegetation.
R5 – Housing at gateway to Hope Castle.	Residential	50m S	Residential receptors adjacent to Hope Castle Hotel have partial views of the proposed extension area filtered through existing vegetation.
R6 – Castleblayney town centre	Residential	50m W	Main Street of Castleblayney with first floor residential properties. The location of surrounding built form prevents views from within settlement of Castleblayney. Residential receptors along Muckno street have no views – these are restricted by the location of buildings on the east side of the street.
R7 – Muckno Street housing north of proposed access road entrance.	Residential	30m N	This receptor has partial views of the existing site filtered through existing vegetation and derelict low height buildings in the foreground.
R8 – Golf Club House	Residential	200m S	This receptor has no views of the existing or proposed development due to intervening boundary walls and trees.
R9 – Hope Castle Hotel	Residential	250m S	This receptor has no views of the existing site due to intervening tree cover. However the proposed odour stack and scrubbers will potentially be visible on the existing skyline – currently comprised of woodland.
R10 – Hopefield House	Residential	1.2km N	This receptor has no views of the existing site due to intervening vegetation associated with northern part of Lough Muckno. However, it is predicted that there will be views of the upper parts of the odour stack and scrubbers above the existing skyline – currently comprising woodland vegetation.
OS1 – Black Island Picnic Area	Open Space	150m E	There are no views of the existing site due to intervening vegetation associated with the edge of Lough Muckno. However, it is predicted that there will be views of the upper parts of the odour stack and scrubbers above the existing skyline – currently comprising tree vegetation. i
OS2 – Black Island walking route	Open Space	150m NE	This receptor has partial views of the existing site filtered through intervening vegetation during period of leaf loss. However, it is predicted that there will be views of the proposed dewatering building, control house, the odour stack and scrubbers throughout the year.

Receptor Id	Receptor Category	Approximate distance from development site extension area (metres)	Type of view
OS3 – Mindszenby Park	Open Space	120m N	Views are screened by intervening bands of vegetation, in particular the dense reed bed vegetation associated with the waterbody.
OS4 – Hope Castle open space	Open Space	200m S	The large open area of grassland situated on a northeast facing hillside has no views due to the due to a screening belt of conifers and dense deciduous vegetation situated along Black Island access road. However, it is predicted that there will be views of the upper parts of the odour stack and scrubbers above the existing skyline – currently comprising woodland vegetation.
The Monaghan Way	Walking Route	200m S	This receptor has no views of the existing site and will have no views of the proposed development due to intervening vegetation.
Muckno Street (R181)	Highway	0m W	Views of the existing site are prevented by intervening built form and will have no views of the proposed development.
Main Street	Highway	100m SW	The surrounding built form along Main Street prevents views of the existing site and proposed development.
Black Island access road	Access Road	150m S	Views along the access road are prevented by the immediate scrub vegetation and semi-mature trees surrounding. Though partial views of the proposed odour stack and scrubbers will be filtered through the existing tree line.
Hope Castle Hotel access road	Access Road	150m S	This receptor has no views of the existing site due to intervening vegetation, however, it is predicted that there will be views of the upper parts of the odour stack and scrubbers above the existing skyline – currently comprising woodland vegetation.

8.3.3 Predicted Trends

The Castleblayney Town Development Plan (2007-2013) identifies specific zones within the study area as suitable for development (**Figure 2.1**). To the north, west and east of Castleblayney town centre, large areas of land have been allocated for low and high density housing. Large areas of Castleblayney have also been designated for industry and employment development which will change the pattern and character of the existing town environment; and introduce more built form.

8.3.4 Information Gaps

The study was based on desktop research and single field visit and as such, the names of individual properties could not be ascertained therefore, indicative names have been given for some properties.

8.4 Potential Effects and Incorporated Mitigation

8.4.1 Potential Effects during Construction and Incorporated Mitigation

Landscape

Stage 1

The first stage of the works is to be primarily confined within the existing WwTW area. During this period the proposed access route from Muckno Street will be constructed, including the culvert of the water channel (ditch) to accommodate the proposed access road. Works will result in the loss of a short section of open ditch and vegetation associated with the ditch; and the loss of vegetation for the proposed access road.

Construction works within the existing WwTW area will primarily involve the loss of hard standings with little affect on the landscape. However the construction of elements towards the edges of the area may result in the incidental loss or damage to surrounding vegetation. The construction of the access road will have an effect on the surrounding vegetation as machinery may damage or result in additional loss of vegetation adjacent to the road.

Development of the extension area involves the removal of large areas of vegetation which will have an adverse effect on the rural characteristics of the area. The removed vegetation will include the loss of marsh grassland associated with the watercourse and removal of the water ditch that flows through the centre of the proposed development. Retention of existing bands of vegetation to the south and west of the extension area will reduce the landscape effects of the extension area development.

As part of the Stage 1 works the 4no. odour control scrubbers will be constructed within the existing WwTW area. This will involve cranes during the construction which will have a temporary affect on the landscape character, though it is not predicted that this will be of significance as the vertical element is temporary and for a short period.

The introduction of a new access road across a currently undeveloped area of land will involve the removal of existing scrub vegetation. This vegetation is not considered to be sensitive (it is in poor condition, unmanaged, is not a valued feature within the landscape, and is typical of brownfield vegetation). The access road will incorporate a crossing point over a natural water ditch that crosses directly across the path of the road. The development will include the development of a culvert beneath the access road and removal of the natural vegetation surrounding the ditch.

Stage 2

The second phase of construction will involve the development of the extension area located to the south and east of the existing WwTW; including introduction of the treatment work tanks, the provision of access and earthworks required to prevent flooding. This construction phase will introduce large vehicles and machinery within the area that may potentially damage surrounding vegetation. As part of the Stage 2 works the 20m odour stack will be constructed within the existing WwTW area. This will involve cranes during the construction which will have a temporary affect on the landscape character, though it is not predicted that this will be of significance as the vertical element is temporary and for a short period. The construction of the second phase will involve increased use of heavy vehicles accessing the site which will have a temporary effect on the character of the area.

Visual

Stage 1

The first phase of construction within the existing WwTW works are unlikely to result in significant effects on the views or visual amenity of surrounding visual receptors as the majority of works will be screened by built form located both within the site and surrounding the site. Existing evergreen vegetation located along the northwest site boundary will screen potential views from the majority of receptors located to the west. However, some receptors may have filtered views of construction works where vegetation is thinning or not continuous. In addition, the introduction of construction vehicles may affect the views and visual amenity of residential receptors located within the immediate vicinity of the proposed entrance and access road.

Construction works within the northern part of the existing WwTW may be visible from receptors immediately surrounding the site with taller machinery being particularly evident. Existing vegetation surrounding the site, in particular the vegetation to the south and within the extension area, will screen the majority of works from receptors to the south of the site.

The construction of the odour control scrubbers will introduce cranes within the existing tree/woodland dominated skyline. Whilst these will be available to a number of surroundings receptors, they will form a temporary element and therefore it is considered that this will not be of significance.

Stage 2

Construction operations associated with the proposed extension area will afford primarily enclosed views, restricted by the surrounding dense vegetation immediately adjacent to the area. Earthworks within the area may involve the removal of earth to an offsite location and the import of materials. These mechanical/vehicular works are likely to have a visual effect on receptors that have available views of the access road and entrance, where there will be a temporary heavier traffic load.

Construction machinery will be brought onto site for building of the treatment works, this machinery, in particular the use of taller equipment (i.e. cranes and piling rigs) are likely to have a temporary visual effect. The introduction of new elements (cranes) within the existing tree/woodland dominated skyline will be available to a number of surroundings receptors, however they will form a temporary element and therefore it is considered that this will not be of significance.

Mitigation Measures

To reduce the impact of machinery on the landscape and visual receptors, construction hours will be restricted to 08.00-18.00 on weekdays. Use of taller machinery, such as cranes and piling rigs will be restricted to only the necessary period required.

Construction of a phased development will ensure that visual receptors from the south will not be affected by the Stage 1 development as existing vegetation within the proposed extension area will provide screening of the development within the existing WwTW.

8.4.2 Potential Effects during Operation and Incorporated Mitigation

Landscape

The scale of the development and size of the introduced built form will influence the effect that the development has on the landscape. The addition of further built form within a natural environment surrounding the watercourse will add further structural elements to the landscape having an affect on the character of the area.

The small scale development of the existing WwTW area will not affect the pattern of this landscape as the built form is similar in design to the existing development. The development of the proposed extension area will have an effect on the pattern of the landscape as the proposals will increase the scale of the WwTW to nearly double its existing size. However as the development reflects the existing WwTW in shape and size, the impact that it will have on the landscape is reduced in scale.

The operation of the proposed development involves the expansion of an already operational WwTW which will have a slight affect on the character of the area. The increase in built form will have a stronger influence on the landscape character of the area, however as the development is introducing an element or land use type that is already within the affects on the character will be minimal.

Increased traffic associated with the development will have an effect on the character of the area. In particular along Muckno Street where the additional heavy traffic will increase the industrial influence of the area.

Visual

The enclosed location of the proposed development will ensure that few receptors are affected by the development. The operational effects of the Stage 1 area are likely to have a little effect due to the location of the surrounding built form and boundary vegetation surrounding the site. Receptors likely to be affected are those located to the west of the site where filtered/partial views of the development may be available.

The effects of the extension area development will affect a small number of receptors as the majority of views into the area are screened by dense bands of mixed vegetation surrounding the development. Some broken views through existing vegetation may afford visibility of the extension area.

Though the site is surrounding by sloped hills to the south and east, it is anticipated that the existing vegetation within these areas will provide screening to the majority of receptors from these areas. Views from the west of the development site are restricted by the surrounding built form and it is predicted that this will limit the visual effect of the proposals on receptors.

Existing views within the study area will potentially be affected by the proposed construction of the approximate 20m odour stack and odour control scrubbers. This may potentially affect a number of visual receptors that do not have views of the existing WwTW. Potential effects are associated with the change in existing views of a wooded skyline to the introduction of a new dominant elements (built form) not currently found within the view.

The scale of the development and materials used will have an effect on the impact that the proposals will have on potential receptors. The scale of the proposed development area is slightly larger than the existing development and will be visible to receptors within the immediate area surrounding the development. The introduction of structural elements will reflect the form of the existing WwTW and will take similar structures to the existing shapes of the existing development.

The proposed access route is likely to affect the residential receptors located around the entrance point at Muckno Street. Users of the road will be potentially affected by the increased volumes of traffic entering and leaving the proposed access road that will be associated with the increase of the WwTW development.

Mitigation Measures

The effect of the development on the landscape, in particular within the extension area where largest loss of vegetation is proposed, will be reduced through retention of existing vegetation

where possible. By retaining existing vegetation surrounding the development the development will have a reduced impact on both the landscape and visual effects.

The proposals ensure that any new built form will be constructed in keeping with the existing WwTW so as to reduce the impact on the landscape character and visual receptors. The effect of the development will also be reduced by the use of neutral colours that match with the existing development and do not visually stand out in the landscape.

Table 8.7 Summary of Incorporated Mitigation

Receptor	Potential Effects	Incorporated Mitigation Measures and Rationale for their Likely Effectiveness
Construction		
Visual receptors in close proximity	Introduction of construction activities associated with site compounds and storage which appear as intrusive new (albeit temporary) elements in views.	Locate any contractor's equipment or onsite material storage away from nearby sensitive visual receptors located to the east and southeast. Likely to be effective.
Visual receptors within study area	Introduction of vertical elements (temporary) associated with machinery during construction period.	Restrict onsite machinery to required usage only limiting the time frame for the required tall elements during the construction stage. High certainty of effectiveness.
Landscape elements	Removal of existing vegetation to accommodate for the development.	Retention of hedgerows/trees that are valued landscape elements. High certainty of effectiveness.
Local landscape character	Loss of vegetation and boundary hedgerows/trees within the proposed extension area during phased construction of development.	Limit disruption/removal where possible. Likely to be effective.
Operation		
Visual impact of development	Visual intrusion of newly built operational elements.	Reduction of development height to minimum heights possible. Setting units of the extension area in appropriate locations to reduce visual impact. Retain boundary vegetation where possible to increase screening potential. High certainty of effectiveness
Onsite vegetation	Loss of vegetation during development of the proposed extension area.	Remove only necessary vegetation to accommodate the development and retain as much of existing vegetation where possible. High certainty of effectiveness
Topography	Effect of landform alterations to accommodate a stable platform for development on the local landscape character.	Setting units in the slope of the landscape to reduce earthworks required. High certainty of effectiveness

8.5 Assessment of Effects

8.5.1 Significance Evaluation Methodology

Landscape Effects

Criteria for the Evaluation of Landscape effects

The significance of landscape effects reflects the sensitivity of the landscape to change (**Table 8.1**) and the magnitude of that change (**Table 8.2**). The evaluation of criteria and thresholds is primarily based upon professional judgement.

Significance of Landscape Effects

There has been a general consensus in recent landscape assessments on the recognition of three thresholds of significance that are derived from different combinations of landscape resource sensitivity and impact magnitudes, as reflected in the LI / IEMA Guidelines. These are:

- ‘major’ meaning high sensitivity or major magnitude;
- ‘minor’ meaning medium sensitivity or some magnitude; and
- ‘not significant’ meaning low sensitivity or minor magnitude.

The assessment of significance is on a qualitative basis, as a scoring system does not avoid subjectivity and suggests a certainty that may not be present.

Visual Effects Evaluation

Criteria for the Evaluation of Visual effects

Significance is dependent on two criteria:

- the sensitivity of the receptor to the identified impact; and
- the magnitude of the predicted changes as measured along an agreed continuum.

The different receptor categories are ranked in order of their sensitivity to visual impacts as set out in **Table 8.3**.

The magnitude of visual effect is a function of three factors:

- The number of visual receptors affected;
- The distance from receptors to the source(s) of visual impact; and
- The degree of change to existing views and the scale of the proposed extension.

These factors are graded in accordance with **Table 8.4**.

Significance of Visual Effects

There has been a general consensus in recent landscape assessments on the recognition of three thresholds of significance, that are derived from different combinations of sensitivity and magnitude, reflecting the categories and principles laid down by the LI / IEMA. These are:

- ‘major’ meaning high sensitivity or high magnitude;
- ‘minor’ meaning medium sensitivity or medium magnitude; and
- ‘not significant’ meaning low sensitivity or low magnitude.

It is clear that a number of intermediate situations occur with, for example, a receptor of medium sensitivity combined with an effect of high magnitude. Relevant guidelines (The Landscape Institute, 1999) suggest that in such situations, professional judgement should supplement the rigid application of matrix tables. The assessment of significance is on a qualitative basis, as a scoring system does not avoid subjectivity and suggests a certainty that may not be present. The type of effect in the evaluation of the visual effects is categorised as being neutral because the effects constitute negligible change to the view.

8.5.2 Predicted Effects during Construction and their Significance

The following section considers the main predicted effects associated with the construction of the proposed development on the landscape elements, landscape designations and landscape character; and the views and visual amenity of people within the study area.

Landscape

Stage 1

The predicted landscape effects area associated with the changes in the fabric, quality and character of the landscape. The development within the existing WwTW area will have no significant effect on the landscape receptors as the area consists primarily of hard surfacing and will not involve the removal of existing vegetation.

The additional vehicular activity and transportation of materials on/off site during construction will have a temporary adverse effect on the character of the landscape, though the effect will not be significant. Although the construction of the culvert will result in the loss of vegetation, the ditch is of low sensitivity due to the small scale loss of a section of the channel and is therefore not significant.

The construction of the proposed access road will affect the character of the area with the movement of machinery and vehicles. As the construction of this is temporary the impact on the landscape it is not predicted to be of significance.

The introduction of vertical construction elements will have a negative impact on the character of the landscape as these structures are not typical within the area. However the use of this machinery is only temporary and therefore magnitude of the change is negligible and the effects will not be significant.

Stage 2

This construction phase will introduce temporary machinery and vehicles within the proposed extension area. The increased movement of vehicles will alter the character of Muckno Street during construction of Stage 2 though the effect will not be of significance and the change to the landscape character will only be temporary. The temporary increase in traffic will have an effect on the relatively calm, tranquil character of the Ballybay Castleblayney Lakelands landscape character area. The magnitude of change is likely to be low and the effect will not be significant.

The extension area development will incorporate the removal of all vegetation within the main development area to accommodate the proposals. This development will result in the loss of a mix of vegetation types, including hedgerows, trees, associated water channel vegetation and marshy grassland. The value of this existing vegetation contributes to the rural characteristic of the landscape associated with Lough Muckno and the water channel. However, the sensitivity of this vegetation is low as the landscape is unmanaged and comprises poor quality (thinning and under-managed) boundary vegetation that requires maintenance to be sustained. The development of the area will also involve the removal of the water channel along the middle of the site. This ditch is not considered to be valuable as the associated vegetation is of poor

quality and is therefore of low sensitivity. As the proposals involve the removal of a small section of these elements the magnitude is low and therefore the effect is not significant.

Earthworks alterations required to accommodate the development so it is not prone to flooding will have a negative impact on the natural pattern of the landform and will alter the natural landform adjacent to the water channel. However, it is anticipated that these alterations will be minimal be concerned primarily with drainage rather than landform remediation therefore it will not have a significant effect on the landscape.

Visual

Stage 1

Visual effects associated with the construction of the Stage 1 area, are confined to visual receptors located immediately west of the site. It is predicted that development will change the views/visual amenity of residential properties located to the east of Muckno Street (directly adjacent to the site). Filtered, partial views from first floor windows of residential receptor 1 (see Figure 8.3) will be available through existing vegetation to the north of the site, particularly of the taller machinery associated with the construction of the scrubbers. Some vertical elements may be visible during construction though the impact is likely to be if no significance due to the temporary nature of the change.

It is anticipated views will not be available from the majority of receptors from the south due to screening vegetation between the site and Black Island access road. Vegetation located within the extension area will contribute to screening of the Stage 1 of the construction. Some seasonal, partial views may be available of the taller elements from the east i.e. receptors located at Black Island, though it is anticipated that the effects will be insignificant as views are remote.

Visual effects associated with the construction of the access road will be confined to residential properties situated to the immediate north and west of the entrance point of the road. These receptors will have views of the taller elements temporarily introduced during construction. The change in view is associated with the removal of a section of the vegetation within the area to accommodate the access road. Whilst the loss of vegetation will allow views of the new access road, the magnitude of change is considered to be low due to the presence of existing industrial units and derelict land within their view.

Stage 2

The majority of views of construction activity associated with the extension area will be prevented by screening vegetation to the south, east and west of the site. The existing boundary vegetation and vegetation along Black Island access road, which is located adjacent to the caravan park south of the site, will provide screening to receptors from the south. Some filtered views may be available of taller machinery during winter months when broken vegetation bands may allow visibility of parts of the machinery. The upper parts of cranes on the skyline will be visible during construction of the odour stack, though the magnitude of change is likely to be low due to their temporary nature and therefore of it is considered that effects will be of no significance.

Visual receptors who will be affected by the Stage 2 construction are located immediately to the south and southwest of the development area. Although close distance, these views will be partial (viewing only part of the development) and filtered through vegetation. Subsequently it is considered that the magnitude of the change is low and will have an effect of no significance.

It is predicted that views to the north and west of the proposed extension area will be restricted by the surrounding built form of Castleblayney and the industrial elements to the north and northwest of the site. Some partial views from the north and northwest may be available of the

taller machinery, though these views will be filtered through existing vegetation and will not generate significant effects.

Receptors along Muckno Street may experience a heavier traffic load, in particular around the new entrance point, though this effect is likely to be minor as it is temporary during the construction phase.

Due to the enclosed nature of the development area and as a result of the surrounding built form and vegetation, it is anticipated that views will be mainly influenced by the use of taller machinery. As the use of these elements during the construction phase is only temporary it is anticipated that the effect on these views are likely to be of minor significance.

8.5.3 Predicted Effects during Operation and their Significance

Landscape

The predicted landscape effects during the operation period will result from the introduction of built form with a primarily undeveloped site. The addition of the extension area development will increase the influence of industrial built form although it is not introducing a different land use to the character area.

The proposed access road will involve the construction of vegetation across two existing unmanaged fields. Existing vegetation comprises a mix of hedgerow vegetation, scrub and long grassland which will be constructed to accommodate the route of the access road. The route will have a negative effect on the current landscape of the area as it will involve the removal of vegetation, however, it is not anticipated that this will be of significance as vegetation is of low value and removal of a small section. The access road incorporates a crossing point over an existing ditch where the development would include culverting an existing water channel. This culvert will remove existing vegetation associated with the ditch as well as implementation of a structural feature along a natural channel. This culvert point will only culvert a small section of the ditch and as the rest of the channel will be retained in its existing situ it is not anticipated that this will be of significance to the landscape feature.

The increased movement of vehicles along Muckno Street will occur as a result of the operation of the proposed WwTW extension and new entrance point to the site. This additional activity will have a small effect on the setting of the road through the increase of heavy vehicles within the area. This will have a negative effect upon the character of the area, however the effect will not be significant as there is already existing use of heavy vehicles within the area to access the existing WwTW. It is therefore considered that the proposed development will not be of significance to the landscape character.

The overall effect of the development on the landscape is not considered to have a significant impact. The loss of vegetation within the development site will be a change of low magnitude as the current state of vegetation is of poor condition and this type of vegetation is common throughout the landscape of the area. The effect on the landscape character is not significant due to the industrial influence of the existing WwTW and surrounding developments and the development of an already existing feature within the character area.

Visual

The main effects on the views and visual amenity of visual receptors during the operational phase are associated with the introduction of built form and vertical elements that will break the trees dominating the skyline.

The introduction of additional built form into the landscape will have an adverse effect on the receptors surrounding the site as the proposed development will change a large area of the

development site from an undeveloped landscape to an industrial development. However, it is considered that this effect will be minimal and contained to receptors immediately surrounding the site as the existing landform, built form and vegetation bands shape the landscape so that the development will affect few views.

The development within the existing WwTW area will be visible from receptors situated to the north and west of the area. The views will only be available from the north of the taller structures such as the sludge dewatering building where the rectangular form will be visible through existing vegetation. However, these views will only be partial from areas within approximately 100m north of the site as views further are restricted by existing vegetation. Views from the west are only available from upper floors of properties situated to the east of Muckno Road (refer to Photosheet2, photo 3). These receptors will have partial views of the proposed development, i.e. the upper section of part of the site, across the existing WwTW to the larger structural elements to the east of the development. Existing vegetation surrounding the development boundary will restrict views of the development to the north. The change to the existing view is not considered to be of high significance as the development will introduce built form to an area that is currently partially developed and contains areas of hard surfacing. The presence of the existing WwTW contributes to the built form of the existing view and therefore the additional development will have a low effect on receptors.

From the south of the development site filtered views are available from receptors in the immediate surroundings of the development. A dense band of semi-mature deciduous trees and line of coniferous trees restrict views beyond Black Island access road. Although receptors south of this are situated on hill, the vegetation of Black Island access road and the band of vegetation immediately south of the site provide screening of the development. Receptors situated southwest of the site will have partial views of the development, though these views will be filtered by the existing dense area of scrub vegetation and trees situated between the site boundary and the buildings. The access of vehicles within the area will also be partially visible from residential receptor 3 (**Figure 8.3**). Though these receptors will only have partial views of the development, the impact is considered to be of major significance as the change is from existing view of an undeveloped vegetation landscape.

Views from the east and southeast of the development are restricted by the existing vegetation associated with Black Island. It is considered that the dense woodland and sloping landform will provide screening to potential views directly across from the adjacent water channel. The area of reed bed vegetation and taller scrub will also provide screening of the development from the east. Some partial, filtered views may be afforded during winter months from the western part of the Black Island walking route. However, it is anticipated that these views will be minimal and only visible of corner points of rectangular structures that will be visible through the existing reed bed vegetation adjacent during sparser winter months.

The proposed access road will have an adverse effect on the receptors situated adjacent to the entrance point. The change to the view from an undeveloped, vegetated area to an access road for site vehicles will significantly alter views. Views to the north of the development will be restricted by surrounding vegetation, however residential receptors situated close to entrance point to the north will have views of the vehicles access to the site. This change to the existing view is not considered to be of major significance as the view is partial and will only be intermittent as and when vehicles access the site.

West from Castleblayney to the west of the site views are not available due to the built form of the surrounding area which constrain views to within the town. Any long views available from the north of the site that currently look directly along the channel of the Lough are not likely to be affected by the proposed development as the vegetation associated with the waterbody edge channel views and screen the development site.

The proposed odour stack situated within the existing WwTW area will have an effect on the residential receptors located to the southwest of the site along Muckno Street (Photosheet 2, Photo 3). Whilst these receptors will have views of the proposed odour stack – this will generate a low magnitude of change and no significant effects due to the location of odour stack within existing view of built form (of similar type to the proposed odour stack).

The proposed odour stack (approximately 20m height) will be visible from surrounding receptors such as the open space and footpath on Black Island; and open space and residential receptors located to the northwest of the site (refer to Figure 8.3). It is anticipated that the addition of this vertical element within the landscape will alter the existing skyline and introduce a new element onto the existing skyline comprising woodland. However, as this is one element within a panoramic view it is anticipated that the change will be of low magnitude and effect of no significance. The receptors which have long distance views of the proposed development site, such as residential receptor 10 (refer to Figure 8.3 and Photosheet 6, Photo 12), will have an effect of no significance due to the small scale of the odour stack within the panoramic view.

The main visual effect on receptors will be to those situated along Muckno Street, in particular those adjacent to the proposed access road entrance and those located to the west of the development site on the east side of Muckno Street. The majority of these views will be filtered by existing vegetation intercepting views and therefore the significance is minor. The small amount of available receptors to the north and east will not have available views of the development as existing vegetation patterns restrict views. Receptors situated further south and west will not be affected by the proposed development as the surrounding built form restricts any potential views.

8.5.4 Compensation Measures

No compensation has been identified within the development. However, mitigation measures identified below will provide additional compensation to the loss of vegetation within the extension area.

8.5.5 Additional Mitigation/Enhancement Measures

It is suggested that a hedgerow management plan is undertaken to increase the hedgerow density of the existing boundary vegetation to the south of the proposed extension area. An effective management plan would improve the condition of the existing vegetation and reduce the breaks in the band of vegetation.

8.5.6 Summary of Significance Evaluation

The results of the landscape assessment are presented in **Table 8.8** and the visual assessment in **Table 8.9**.

Table 8.8 Effects on Landscape and Evaluation of Significance

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
Construction – Stage 1						

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
Loss of site boundary vegetation – hedgerows and trees to be removed.	Negative	Likely	Local - Medium	Minor	Not Significant	The existing boundary vegetation is of medium significance but the loss of vegetation through construction of elements close to the boundary is likely to be small and therefore not significant.
Loss of vegetation along the proposed site access road.	Negative	Likely	Local - Medium	Minor	Not Significant	Construction of the access road may result in damage/loss of surrounding vegetation during construction though loss is of low magnitude and of no significance to the development.
Sub sequential change to the water channel during construction of the bridging point for the proposed site access road.	Negative	Likely	Local - Low	Minor	Not Significant	Construction of the culvert point may result in incidental changes to the surrounding ditch, the magnitude of this is likely to be low and of no significance to the development.
Removal of ditch within Extension area.	Negative	Certain	Local – Medium	Minor	Not Significant	The loss of the ditch will result in the loss of a small element of the ditch and associated vegetation. The scale of this loss is of low magnitude and not significant to the development.
Loss of vegetation along the proposed site access road.	Negative	Certain	Local - Low	Minor	Minor significance	Removal of vegetation to accommodate the new access route will have minor effect as it will only remove a narrow channel of poor condition grassland vegetation.
Changes to the Ballybay & Castleblayney Lakelands LCA	Negative	Certain	Regional - Medium	Negligible	Not Significant	Temporary increase in construction vehicle movement within the area is likely to have a low effect on the character of the area and not significant.
Construction – Stage 2						
Loss of site vegetation within the proposed extension area.	Negative	Likely	Local - Medium	Minor	Not Significant	Additional loss of vegetation during the construction phase is likely though of no significance as loss is likely to be small.
Loss of site boundary vegetation – hedgerows and trees to be	Negative	Likely	Local - Medium	Minor	Not Significant	Incidental loss of boundary vegetation during construction of elements situated close to the extension area boundary will have a

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

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
removed.						minor effect though scale is likely to be small and not significant.
Construction works to the landform of the extension area	Negative	Certain	Local - Low	Minor	Not Significant	Earthworks to the extension area to prevent flooding will result in increase use of machinery and movement of material within the area. As this is temporary it is not likely to be significant.
Loss of site vegetation within the proposed extension area.	Negative	Certain	Local - Low	Minor	Minor Significance	Development of the extension area will result in the loss of an area of marshy vegetation which is an unmanaged environment associated with the river. This loss will have a minor effect on the natural vegetation within the area and therefore of minor significance.
Loss of site boundary vegetation – hedgerows and trees to be removed.	Negative	Likely	Local - Low	Minor	Minor Significance	Loss of boundary vegetation along the north of the extension area and the field boundary through the middle of the extension area will have a minor magnitude of effect on the area and therefore a minor significance.
Changes to the landform to provide a stable platform for the proposed development.	Negative	Certain	District - Low	Minor	Not Significant	Earthworks within the extension area to prevent flooding will have a moderate effect on the natural landform of the area. However, this change is not likely to involve large remediation works and therefore not of significance.
Changes to the Ballybay & Castleblayney Lakelands LCA	Negative	Certain	Regional - Medium	Negligible	Not Significant	Increase of vehicle movement within the area will have an effect on the character. As this is temporary the effect is not likely to be significant.
Operation						
Alteration to the water channel for bridging point of the proposed site access road.	Negative	Certain	Local - Low	Minor	Not Significant	Though the water channel alteration is a change to the landscape element, it is only of a small section and therefore the magnitude is minor and of minor significance.

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
Change to the landscape pattern through implementation of extension area development.	Negative	Certain	District - Medium	Moderate	Minor Significance	The proposed WwTW upgrade will alter the pattern of the landscape; there will be a loss of an area of natural vegetation and addition of built form. As the scale of the development is not large the magnitude will be moderate and therefore of minor significance. The introduction of vertical elements within the landscape will have an effect on the landscape pattern, however as these elements are in the context of the WwTW it is anticipated that the magnitude of change will be low and the effect of minor significance.
Changes to the Ballybay & Castleblayney Lakelands LCA	Negative	Certain	Regional - Medium	Minor	Not Significant	Addition of further WwTW development to the existing works, the increase of built form, will have a stronger influence within the character area, though the development is small scale and the effect will be minor. It is likely that the character area change will not be significant.
Key:	Type	Probability	Policy Importance	Magnitude	Significance	
	- =	Certain	International	Major	Major Significance	
	+ =	Likely	National	Moderate	Minor Significance	
	? =	Unlikely	Regional	Minor	Not Significant	
			District	Negligible		
			Local			

Table 8.9 Effects on Visual Receptors and Evaluation of Significance

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
Construction – Stage 1						
R1 – Muckno Street (R181) housing directly west of the site.	Negative	Certain	Local – High	Minor	Not Significant	Broken views from the first floor of some of the properties will look onto construction works to the north of the existing WwTW area. Views of taller machinery will be

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
						available and some broken views through existing vegetation of building construction.
R2 – Muckno Street housing southwest of the site.	Negative	Likely	Local – High	Minor	Not Significant	Majority of views onto the construction area as screened by intervening buildings and vegetation. Some views of the taller machinery (i.e. cranes and piling rig) will be available. The temporary effect on these views is not considered significant.
R3 Muckno Street housing west of the proposed access road entrance.	Negative	Certain	Local – High	Minor	Not Significant	Receptors look directly onto the proposed entrance of the new access road. Direct views of the construction of the entrance point and movement of machinery along the road will be available. This effect is temporary during construction and therefore of no significance.
R5 – Housing at gateway to Hope Castle.	Negative	Unlikely	Local – High	Negligible	Not Significant	The visual effect on these receptors is negligible as views to the north are limited due to surrounding built form and vegetation bands. Views of the Stage 1 construction are therefore not available.
R7 – Muckno Street housing north of proposed access road entrance.	Negative	Likely	Local – High	Minor	Not Significant	Receptors afford some broken views to the south towards the entrance area of the access road. Some views of machinery and traffic moving along the access road during construction of the access road. The effect is remote and therefore not significant.
OS1 – Black Island Picnic Area	Negative	Unlikely	Local - Medium	Minor	Not Significant	Views of the development area are restricted by intervening vegetation, though some views may be available of taller machinery which will have a minor effect on the open space, though not significant as the impact is small and temporary.
OS2 – Black Island walking route	Negative	Unlikely	Local – Medium	Minor	Not Significant	Seasonal broken views of taller construction machinery at intermittent opportunities along the walking route will have a temporary minor effect and are not significant.

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

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
OS3 – Mindszenby Park	Negative	Unlikely	Local – Medium	Negligible	Not Significant	Views will be screened by vegetation in the foreground and therefore the impact will be negligible and of no significance.
Construction - Stage 2						
R1 – Muckno Street (R181) housing directly west of the site.	Negative	Likely	Local – High	Minor	Not Significant	Views to the east are screened by the large industrial unit adjacent and vegetation beyond. Some Views may be available of taller machinery and is of minor magnitude. Temporary change to the receptors is not significant.
R2 – Muckno Street housing southwest of the site.	Negative	Certain	Local – High	Minor	Not Significant	Views from the upper floors of properties will have broken views of machinery within the extension area and the effect will be minor and not significant.
R3 Muckno Street housing west of the proposed access road entrance.	Negative	Likely	Local – High	Negligible	Not Significant	The magnitude of change is negligible as views of extension area construction are likely to be screened by cattle market/existing site in foreground. There will be some increased movement of traffic along access road during construction will temporarily affect views.
R5 – Housing at gateway to Hope Castle.	Negative	Likely	Local – High	Minor	Not Significant	Minor effect on receptors and there will be some broken views from first floor windows of construction, in particular taller machinery, within the extension area. Small scale change is not significant.
R7 – Muckno Street housing north of proposed access road entrance.	Negative	Unlikely	Local – High	Minor	Not Significant	Views of the extension area are screened by intervening built form and vegetation though some views of construction machinery accessing the site may be available and have a minor effect on receptors.
OS1 – Black	Negative	Likely	Local -	Minor	Not	Some broken views of taller construction

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
Island Picnic Area			Medium		Significant	machinery across existing vegetation will have a minor effect on the users of the picnic area. The low magnitude and temporary effect is not significant.
OS2 – Black Island walking route	Negative	Unlikely	Local – Medium	Negligible	Not Significant	Views are anticipated to be restricted by existing thickly vegetated slope of Black island. Some broken views may be available of construction vehicles accessing the site from the west of the path. These intermittent views are negligible and the effect is likely to be remote.
Operation						
R1 – Muckno Street (R181) housing directly west of the site.	Negative	Certain	Local – High	Minor	Minor Significance	Some views will be available from first floor of properties towards the north of the existing WwTW area development. Views of the extension area will be screened by the large industrial unit and vegetation between. The influence of the existing WwTW will have a lesser impact on receptors due to existing WwTW built form and therefore magnitude is minor and the effect is of minor significance.
R2 – Muckno Street housing southwest of the site.	Negative	Certain	Local – High	Minor	Minor Significance	Views from properties will experience a major change in view from an undeveloped landscape to a WwTW, though views only likely to be available from upper floors. This change is of minor magnitude and therefore of minor significance to the development.
R3 Muckno Street housing west of the proposed access road entrance.	Negative	Certain	Local – High	Moderate	Minor Significance	Receptors will have direct views onto the proposed access road entrance. This effect is of minor magnitude and minor significance as the change in the existing view is from scrub land to a heavy vehicle access route.
R4 – Derelict Caravan Park.	Negative	Certain	Local – High	Minor	Minor Significance	Should the caravan park become active, temporary residence staying in the park will have broken views across the

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

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
						vegetation bands of the extension area development. This will slightly influence views and is of minor significance.
R5 – Housing at gateway to Hope Castle.	Negative	Certain	Local – High	Minor	Minor Significance	Some broken views from upper floors across to the extension area may be available where boundary vegetation does not screen. The impact on the receptors is of minor significance as the change to view is not likely to be great.
R7 – Muckno Street housing north of proposed access road entrance.	Negative	Likely	Local – High	Minor	Not Significant	There will be some broken views of vehicles accessing the proposed new site road, which will be more prominent through the winter, this will have a minor effect on receptors.
R8 – Golf Club House	Negative	Unlikely	Local – High	Negligible	Not Significant	Views are not likely to change due to existing situation and built form.
R9 – Hope Castle Hotel	Negative	Unlikely	Local – High	Negligible	Not Significant	Views to the north are not likely to change and views of the development are not available due to surrounding vegetation.
R10 – Hopefield House	Negative	Unlikely	Local – High	Negligible	Not Significant	Long distance views of the development are not likely to be available due to the shape of the landform and situation of existing vegetation.
OS1 – Black Island Picnic Area	Negative	Unlikely	Local – Medium	Negligible	Not Significant	Views of the development will be restricted by the immediate woodland surrounding the picnic area and the water channel vegetation opposite.
OS2 – Black Island walking route	Negative	Unlikely	Local – Medium	Negligible	Not Significant	Retention of sufficient amounts of vegetation to the north east of the development and existing Black Island vegetation should provide screening of the development. Additional soft landscaping along the boundary would ensure no views were available. Should no screening be incorporated, broken views of the north of the development would be available from the west of

Environmental Effect	Type of Effect	Probability of Effect Occurring	Policy Importance (or sensitivity)	Magnitude of Effect	Significance	
					Level	Rationale
						the route, though the impact would be minimal due to intervening vegetation.
OS3 – Mindszenby Park	Negative	Unlikely	Local – Medium	Negligible	Not Significant	The existing shape of the northern waterbody and vegetation provide good screening of development and therefore it is not likely to be of any significance. Some views would be available of the proposed odour stack, this vertical element would alter the skyline however it is anticipated that the change will be of low magnitude due to scale of the stack against existing woodland vegetation and therefore the effect would not be significant.
OS4 – Hope Castle open space	Negative	Unlikely	Local – Medium	Negligible	Not Significant	<p>The impact of the development on this open space is negligible as existing vegetation along Black Island access road provides screening of the majority of the development.</p> <p>It is anticipated that the proposed odour stack would alter the existing skyline however this would be a small element within the view and therefore the magnitude of change would be negligible resulting in an effect of no significance.</p>
Black Island access road	Negative	Unlikely	Local – Medium	Negligible	Not Significant	The dense woodland situated adjacent to the access road will restrict any views of the development and have negligible effect.
Key:	Type	Probability	Policy Importance	Magnitude	Significance	
	- =	Certain	International	Major	Major Significance	
	+ =	Likely	National	Moderate	Minor Significance	
	? =	Unlikely	Regional	Minor	Not Significant	
			District	Negligible		
			Local			

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