

ATTACHMENT NUMBER C1

Air

Contents

There are no attachments.

The existing air quality is described in detail in Sections 4.1 and 4.2 of the Environmental Impact Statement (EIS) accompanying this licence application.

Copies of the Ambient Air Quality Monitoring Report (TMS Environment Ltd., October 2000) and Baseline Dioxin Level Survey (ASEP, September 2000) are included in Attachments 4 and 3 respectively of the EIS.

A three month PM₁₀ baseline study will be carried out at the site, the results of which will be forwarded to the EPA when available.

ATTACHMENT NUMBER C2

Climate

Contents

Attachment C2.1

Existing Climate

Attachment C2.2

**Climatic Data for Dublin Airport, Annaskeagh
Waterworks, Dundalk and other locations in Co. Meath**

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C2.1 EXISTING CLIMATE

1. GENERAL

The general climatic conditions are described below in terms of rainfall, average monthly temperatures, relative humidity and prevailing wind direction and strength statistics, which are available from Met Eireann. Full details are provided in Attachment C2.2.

1.1 TEMPERATURE

Temperature data is available for both Dundalk (Annaskeagh Waterworks) and Dublin Airport. A summary of the data for Annaskeagh is provided in Table 1.1 below, based on data from 1974 to 1997.

Table 1.1 Monthly Mean and Extreme Temperature Values for Annaskeagh, Co. Louth

Month	Mean (°C)	Absolute Max (°C)	Absolute Min (°C)
January	4.2	13.5	-12.2
February	4.5	13.6	-6.8
March	5.9	15.9	-6.6
April	7.7	19.9	-3.6
May	10.2	24.9	-3.8
June	12.9	29.1	-0.3
July	15.0	27.6	3.4
August	14.7	30.3	3.2
September	12.3	26.1	-0.4
October	9.6	19.9	-2.6
November	6.5	15.9	-5.1
December	5.1	14.4	-8.8

1.2 RELATIVE HUMIDITY AND WIND

Humidity and wind data is available only for Dublin Airport. A summary of the data for Dublin Airport is provided in Table 1.2 below, based on data from 1961 to 1990. The prevailing wind direction at Dublin Airport is west and south-west.

Table 1.2 Monthly Mean Relative Humidity and Wind Speed Values for Dublin Airport

Month	Relative Humidity Mean (%) ¹	Relative Humidity Mean (%) ²	Wind Speed (knots)
January	66	79	12.2
February	64	75	11.7
March	62	70	11.6
April	79	68	9.7
May	76	67	8.7
June	78	68	8.0
July	81	68	8.1
August	82	70	8.9
September	85	70	9.9
October	86	75	10.8
November	86	78	11.8
December	82	81	9.9

Notes:

1. Relative Humidity recorded at 09:00 hrs
2. Relative Humidity recorded at 15:00 hrs

1.3 RAINFALL

Rainfall data is available for Duleek, Dundalk (Annaskeagh Waterworks), Dublin Airport and a number of other locations in Co. Meath.

The annual average rainfall at Duleek is 811mm. The average monthly values for Duleek are given in Table 1.3 below, based on data between 1961 and 1990.

Table 1.3 Monthly Average Rainfall for Duleek

Month	Average Rainfall (mm)
January	79
February	57
March	61
April	55
May	58
June	58
July	55
August	69
September	71
October	78
November	71
December	81

2. MICRO-CLIMATE

The physical nature of the landscape of the development site and immediate vicinity, i.e. low lying, relatively flat terrain, agricultural land means that the site does not have any distinctive micro-climate in comparison to the larger surrounding area. There are no natural or semi-natural habitats, such as woodlands or marshes on the development site which could have an influence on micro-climate.

The site comprises four agricultural fields with hedgerows and/or treelines forming the field boundaries. The only habitats present are grassland, both meadow and pasture, and hedgerows and ditches which do not significantly influence micro-climate.

Attachment C2.2

**Climatic Data for Dublin Airport, Annaskeagh
Waterworks, Dundalk and other locations in Co.
Meath**

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DUNDALK (Annaskeagh Waterworks), Co. Louth

lat. 54° 03' N long. 6° 21' W height 61 metres above mean sea level

monthly mean and extreme values 1974 - 1997

month	temperature (degrees Celsius)						rainfall (millimetres)			
	mean	mean max.	mean min.	mean no. of days with air frost	absolute max.	absolute min.	mean monthly total	mean no. of days with 0.2mm or more	mean no. of days with 1.0mm or more	max. daily fall
jan	4.2	7.2	1.2	11	13.5	-12.2	101.4	22	16	37.6
feb	4.5	7.5	1.5	7	13.6	-6.8	78.4	17	12	35.2
mar	5.9	9.2	2.6	6	15.9	-6.6	82.8	19	14	30.3
apr	7.7	11.6	3.8	3	19.9	-3.8	60.2	15	11	53.9
may	10.2	14.3	6.0	0	24.9	-1.9	59.3	15	11	21.8
jun	12.9	17.0	8.8	0	29.1	-0.3	68.2	16	11	43.6
jul	15.0	19.0	11.0	0	27.6	3.4	64.6	16	11	35.6
aug	14.7	18.7	10.7	0	30.3	3.2	74.9	17	12	44.1
sep	12.3	16.1	8.4	0	26.1	-0.4	82.2	17	12	45.8
oct	9.6	13.0	6.2	1	19.9	-2.6	95.9	20	14	44.8
nov	6.5	9.7	3.2	5	15.9	-5.1	89.4	19	13	44.8
dec	5.1	8.0	2.3	8	14.4	-8.8	105.9	21	15	52.4

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DUBLIN AIRPORT

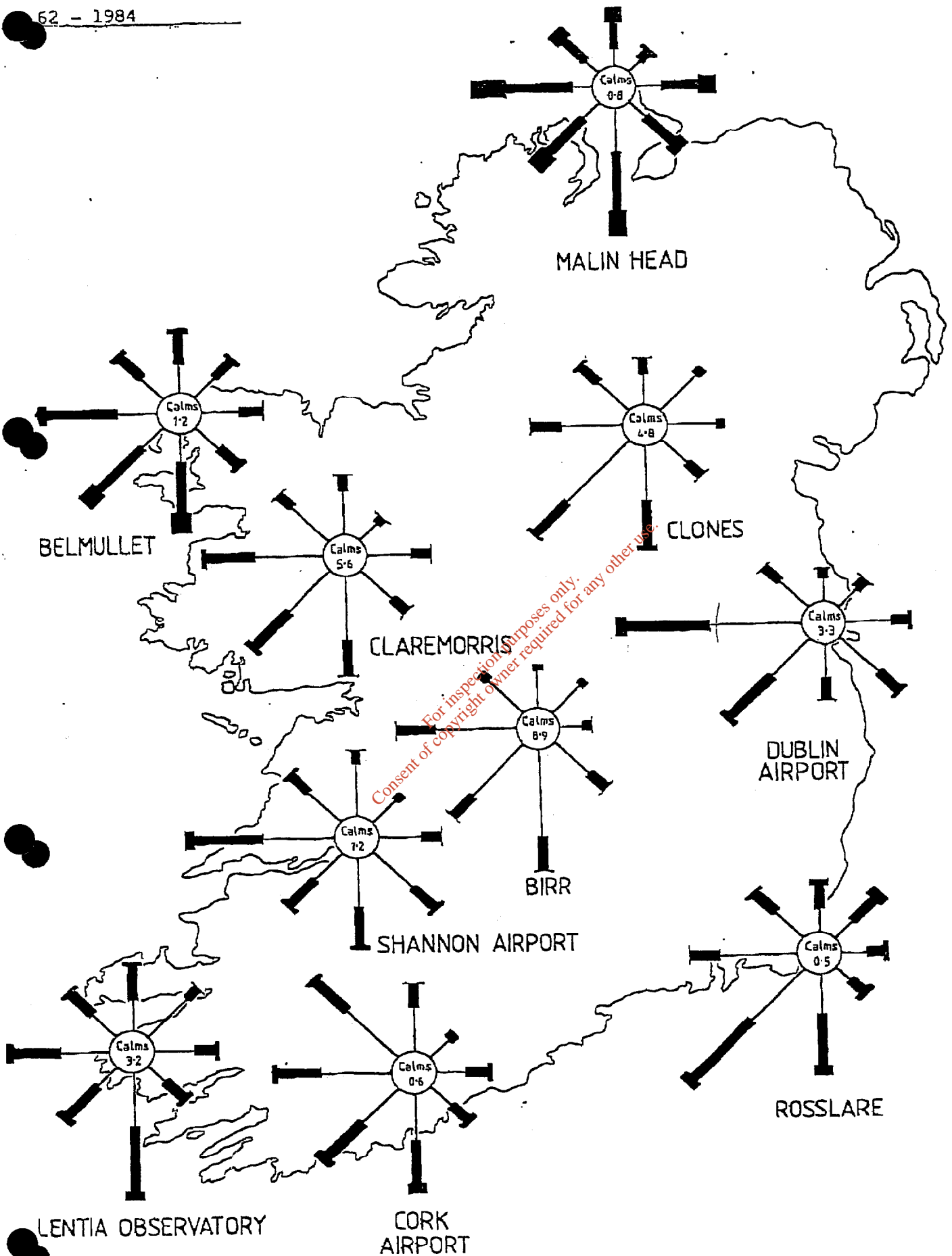
monthly and annual mean and extreme values
1961-1990

lat. 53° 25' N
long. 6° 14' W
height 71 metres above mean sea level

TEMPERATURE (degrees Celsius)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
mean daily max.	7.6	7.5	9.5	11.4	14.2	17.2	18.9	18.6	16.6	13.7	9.8	8.4	12.8
mean daily min.	2.5	2.5	3.1	4.4	6.8	9.6	11.4	11.1	9.6	7.6	4.2	3.4	6.4
mean	5.0	5.0	6.3	7.9	10.5	13.4	15.1	14.9	13.1	10.6	7.0	5.9	9.6
absolute max.	16.6	15.3	21.3	20.5	23.4	25.1	27.6	28.7	23.9	21.2	18.0	16.2	28.7
absolute min.	-9.4	-6.2	-6.7	-3.7	-1.0	1.5	4.8	4.1	1.7	-0.6	-3.4	-10.1	-10.1
mean no. of days with air frost	6.4	4.9	3.3	1.4	0.2	0.0	0.0	0.0	0.0	0.1	3.3	4.8	24.3
mean no. of days with ground frost	14.0	12.7	12.4	9.2	2.9	0.2	0.0	0.0	0.6	2.3	9.7	12.5	76.4
RELATIVE HUMIDITY (%)													
mean at 0900UTC	86	84	82	79	76	76	78	81	82	85	86	86	82
mean at 1500UTC	79	75	70	68	67	68	68	70	70	75	78	81	72
SUNSHINE (hours)													
mean daily duration	1.8	2.5	3.6	5.2	6.1	6.0	5.4	5.1	4.3	3.1	2.4	1.7	3.9
greatest daily duration	8.0	9.2	11.9	13.8	15.4	15.9	15.4	14.5	12.4	10.4	8.5	6.8	15.9
mean no. of days with no sun	11	8	5	3	2	2	1	2	3	6	8	11	61
RAINFALL (mm)													
mean monthly total	69.4	50.4	53.8	50.7	55.1	56.0	49.9	70.5	66.7	69.7	64.7	75.6	732.7
greatest daily total	30.3	31.3	35.7	26.2	30.0	46.6	34.0	60.2	40.9	47.5	55.1	41.7	60.2
mean no. of days with ≥ 0.2 mm	18	14	16	14	16	14	13	15	15	16	16	18	185
mean no. of days with ≥ 1.0 mm	13	10	11	10	11	10	9	11	10	11	11	12	128
mean no. of days with ≥ 5.0 mm	5	3	3	3	4	4	3	4	4	4	4	5	48
WIND (knots)													
mean monthly speed	12.2	11.7	11.6	9.7	8.7	8.0	8.1	8.0	8.9	9.9	10.8	11.8	9.9
max. gust	75	73	61	60	58	55	54	56	64	73	64	71	75
max. mean 10-minute speed	48	49	42	41	39	36	34	41	35	45	43	47	49
mean no. of days with gales	2.1	1.1	1.2	0.3	0.3	0.1	0.0	0.3	0.2	0.6	0.7	1.4	8.2
WEATHER (mean no. of days with...)													
snow or sleet	6.0	5.5	4.3	1.7	0.3	0.0	0.0	0.0	0.0	0.1	0.9	2.9	21.6
snow lying at 0900UTC	2.1	1.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	4.5
hail	0.7	0.9	2.2	2.4	1.4	0.9	0.1	0.1	0.0	0.2	0.6	0.8	9.5
funder	0.1	0.1	0.2	0.3	0.6	0.7	0.7	0.6	0.3	0.3	0.1	0.1	4.1
icy	4.8	4.3	3.9	4.5	3.6	3.1	3.6	5.9	4.9	4.7	4.0	3.9	50.5

Frequency of wind directions for groups of wind speeds at selected stations,

62 - 1984



Scale of frequency 0 5 10 15 20 25 %

Scale of speed 0.3 to 5.4 5.5 to 10.7 10.8 or more metres/sec
 Beaufort force 1 to 3 4 5

MONTHLY AND ANNUAL RAINFALL AVERAGES (mm) 1961 - 1990

name	grid ref.	ht.(m)	opened	closed	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annual
Co. Meath																	
ATHBOY G.S.	N715638	69	1951	1993	85	60	64	55	58	57	56	76	76	80	77	87	831
BALLIVOR G.S.	N685542	68	1943		86	61	65	55	62	58	54	76	75	83	80	85	839
BELLEWSTOWN	O098672	122	1975		74	52	58	54	60	59	54	75	71	78	70	80	784
CROSSAKIEL G.S.	N647742	160	1943	1984	106	73	80	64	75	72	68	90	92	100	89	103	1013
DULEEK G.S.	O047602	29	1949		79	57	61	55	58	58	55	69	71	78	71	81	792
DUNBOYNE G.S.	O013423	72	1949	1990	77	54	56	54	59	57	52	76	71	78	71	83	788
DUNSANY (GRANGE)	N888528	90	1963		80	59	65	56	63	61	54	74	76	82	74	86	828
DUNSHAUGHLIN G.S.	N969522	105	1942	1981	85	61	64	58	65	62	57	77	77	82	77	80	853
JULIANSTOWN G.S.	O133705	15	1949	1983	73	52	57	51	55	55	52	68	67	74	69	78	750
KELLS (HEADFORT)	N761769	67	1892		93	65	72	60	67	63	59	81	81	87	80	89	896
KILMESSAN G.S.	N888573	66	1949	1990	80	57	61	54	61	58	54	72	71	79	71	85	802
KINGSCOURT GYPSUM	N788922	67	1981		106	73	77	64	69	66	63	84	87	97	88	100	973
LONGWOOD G.S.	N712453	74	1943	1986	84	61	63	54	62	61	55	76	77	84	79	86	843
NAVAN	N861672	50	1944		81	59	63	57	60	59	56	76	75	79	74	84	823
NOBBER G.S.	N825863	56	1943		91	62	68	57	62	58	55	79	79	86	78	85	860
SLANE G.S.	N961740	58	1942	1985	85	60	65	58	64	61	57	80	75	83	74	85	846
TRIM (LACKANASH)	N808570	61	1968	1984	79	56	60	52	59	58	51	70	71	76	71	82	784
TRIM G.S.	N803566	58	1944		81	59	64	54	60	58	55	70	74	79	75	85	814
WARRENTOWN	N921535	90	1951		85	61	66	58	63	63	56	78	77	84	78	90	860

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MONTHLY AND ANNUAL RAINFALL AVERAGES (mm) 1961 - 1990

name	grid ref.	ht.(m)	opened	closed	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annual
Co. Louth																	
ARDEE (BOHARNAMOE)	N941902	31	1968		87	61	63	55	60	58	53	74	70	81	75	82	819
ARDEE (ST.BRIGID'S HOSP.)	N957904	32	1952		81	56	57	49	56	52	49	66	64	72	69	74	744
ARDEE O.P.W.	N958912	29	1970		88	62	62	54	61	59	53	74	71	82	76	84	825
CARLINGFORD G.S.	J187118	14	1951	1990	118	81	87	70	72	74	67	92	98	102	99	108	1067
CLOGHERHEAD G.S.	O164839	23	1943	1983	79	56	56	48	56	55	50	65	69	71	70	75	751
COLLON G.S.	O000820	128	1943	1990	96	67	75	65	72	65	63	84	86	92	86	95	945
DROGHEDA (KILLINEER)	O067778	58	1970		79	57	59	56	62	57	55	73	72	79	74	79	800
DUNDALK (CASTLETOWN MT.)	J031082	46	1967	1991	93	63	67	54	57	61	53	74	72	83	80	83	839
DUNDALK(ANNASKEAGH W.W.)	J080128	61	1914		105	71	77	64	65	68	61	83	83	93	90	97	956
DUNLEER G.S.	O057878	38	1951	1990	93	65	67	59	61	61	56	74	75	83	81	88	864
HACKBALLSCROSS G.S.	H967102	69	1951	1984	95	64	67	57	63	62	57	78	75	87	81	88	871
LOUTH G.S.	H961014	37	1943	1990	84	58	60	50	57	54	51	69	65	77	71	79	774
M.DUNDALK (BALLYMAKELLETT)	J106125	232	1915		113	78	80	70	68	73	62	92	91	96	95	99	1017
MELLIFONT ABBEY	O003832	183	1975		101	71	75	66	70	67	64	87	85	93	89	95	962
OMEATH G.S.	J142166	12	1943		131	89	96	71	75	72	64	89	93	108	103	113	1102

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ATTACHMENT NUMBER C3

Cultural Heritage

Contents

Attachment C3.1

Existing Cultural Heritage

A copy of the Archaeological Impact Assessment for the Proposed Development at Carranstown, Co. Meath (Archaeological Development Services Ltd., May 2000) is included in Attachment 11 of the Environmental Impact Statement (EIS) accompanying this licence application.

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C3.1 EXISTING CULTURAL HERITAGE

1. INTRODUCTION

Archaeological Development Services (ADS) Ltd. were commissioned by Project Management Ltd. to carry out an archaeological study and survey of the proposed development site. The study was carried out to identify any items of archaeological significance on the proposed development site and any potential impacts the development could have on such items.

This study and survey consisted of the following:

- A field inspection of the site
- Consultation of the Sites & Monuments Record maintained by Dúchas, The Heritage Service, and the Topographic files maintained by the Irish Antiquities Division of the National Museum of Ireland
- Documentary and Cartographic research

A full copy of the archaeological report is included in Attachment 11 of the EIS.

2. EXISTING ENVIRONMENT

The site is located in a region of historical importance. A visual inspection of the site was carried out on 17 May 2000. The four fields within the site were under pasture at the time of the site survey.

2.1 ARCHAEOLOGY

No evidence of any archaeological remains or features were found on the site. A literature survey, cartographic and aerial photographic research did not reveal any items of archaeological significance on the site.

2.2 ARCHITECTURE

There are no known archaeological monuments/architecture recorded on the site in the Sites & Monuments Record and there are no recorded archaeological finds on the site in the Topographic files of the National Museum of Ireland. There are four recorded monuments in the vicinity of the site which are described in detail in the main report in Attachment 11 of the EIS.

2.3 HISTORICAL FEATURES AND SITES

There are no historical features and sites on the site. The archaeological report deals with these in greater detail (see Attachment 11 of the EIS).

ATTACHMENT NUMBER C4

Ecology

Contents

Attachment C4.1 Existing Ecological Environment

A copy of the Assessment of Impact on Flora and Fauna by Proposed Development at Carranstown, Co. Meath (Biosphere Environmental Services, June 2000) is included in Attachment 10 of the Environmental Impact Statement (EIS) accompanying this licence application.

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C4.1 EXISTING ECOLOGICAL ENVIRONMENT

1. INTRODUCTION

A baseline ecological survey was carried out at the proposed development site in order to assess whether the development would have an impact on any existing flora and fauna on the site.

To this end a site survey was carried out on 11th June 2000 which comprised a thorough examination of the entire site. The areas immediately surrounding the site were also examined, though in lesser detail. The survey methodology consisted of systematically walking the entire site and recording plant species and vegetation types present, with particular emphasis placed on the hedgerows within and around the site.

The birds and mammals observed on the site were recorded, as were any signs of activity or nesting. During the survey, particular attention was given to identifying the presence, or otherwise, of habitats or species which are legally protected under Irish and European legislation.

The listings and maps of sites of conservation importance (Natural Heritage Areas, Special Areas of Conservation, Special Protection Areas) maintained by Dúchas, The National Parks, Wildlife and Heritage Service, as well as the standard literature were checked with reference to the site and surrounding area.

A full copy of the report is included in Attachment 10 of the EIS.

2. EXISTING ENVIRONMENT

2.1 HABITATS AND FLORA

The site is in an area which has for a long period been intensively managed for agricultural purposes and comprises four agricultural fields with hedgerows and/or treelines forming the field boundaries. The habitats present are grassland, (both meadow and pasture), hedgerows and ditches. There are no natural or semi-natural habitats, such as woodlands, marshes, streams or rock outcrops, within the site. A map showing the location of the habitats on the site is included in the report in Attachment 10 of the EIS.

Meadow grassland is the principal habitat type at the site as it occupies the largest area of the agricultural fields with grazed pasture occupying the remainder.

Hedgerows of varying quality form the field boundaries of the site. The hedgerows are comprised almost entirely of hawthorn, with ash occurring as the main tall tree species. Some of the hawthorn trees are very mature, up to 15m high and a few of older trees have a heavy ivy cover. Some of the hedgerows have very significant gaps and many of the hedgerows have poor structural development, with no noticeable understorey or ground layer. Where an understorey does occur it is usually dominated by brambles, nettles, thistles and hogweed.

The hedgerow which marks the townland boundary is accompanied by a wide ditch (ca. 2m width in places). At the time of the survey the ditch was damp in places and some typical shade species such as lords and ladies and hart's tongue fern were noted

within the ditch. One of the internal hedgerows is also accompanied by a wide ditch which was dry at the time of the survey.

No rare, threatened or legally protected plant species, as listed in the Irish Red Data Book were found at the site or have been known to occur in the general area in the past.

The main ecological interest at this site lies in the hedgerows although they can be considered of limited ecological value due to the low species diversity and poor structure. However, the hedgerows do provide some value to local wildlife in what can generally be considered an intensive agricultural landscape.

2.2 BIRDS

A limited number of bird species were recorded due to the low diversity of habitats on the site. The species included woodpigeon, blackbird, chaffinch, robin, wren, blue tit, coal tit and chiffchaff all of which are typical species of agricultural areas with hedgerows. Most of these species would probably nest. A rookery (ie a colony of nesting rooks) was noted in an ash tree located in one of the hedgerows on the western boundary of the site and a further rookery was noted in some ash trees just west of the site. As the survey was carried out in June any winter migrant species which may occur were not recorded. While this is a survey limitation, it is considered unlikely that any rare or scarce bird species would occur in the survey area during winter due to the low diversity and intense management of the habitats present.

2.3 MAMMALS, AMPHIBIANS AND REPTILES

The low habitat diversity within the site results in the mammalian fauna being represented by only a few common species. Rabbits were observed at the site and signs of foxes and brown rats were noted at several locations within the hedgerows and ditches. The hedgehog, pygmy shrew and long-tailed field mouse are all typical species of agricultural habitats and are likely to occur at the site. No signs of badgers were found during the survey although it is considered possible that badger setts could occur within the ditch system associated with two of the hedgerows. If evidence of badgers is found prior to construction, Dúchas, the National Parks, Wildlife and Heritage Service, Dept. of Arts, Heritage, Gaeltacht and the Islands will be informed and appropriate provisions to relocate the badgers will be made in consultation with Dúchas. The habitats at the site are not considered suitable for the common frog or the common lizard.

2.4 LAND DESIGNATION

No part of the site or its immediate surroundings is covered by a scientific or conservation designation as recognised by Dúchas, The Heritage Service. The closest site of conservation importance is the Duleek Commons proposed Natural Heritage Area (pNHA) site no. 1578, located over 2 km to the south west. Two further sites of conservation are located on the River Boyne c. 5km to the northwest of the site. These are the Boyne River Islands (site no. 1862) and Down Wetlands (site no. 1861). Both of these are proposed Natural Heritage Areas (pNHAs) and the Boyne River Islands is also a proposed Special Area of Conservation (pSAC).

2.5 WATER FEATURES

There are no surface water features such as rivers, streams, lakes or ponds on the site. There are a number of drainage ditches on site running alongside the field hedgerow boundaries, all of which were observed to be dry during the summer months. There is a wide ditch (ca. 2 m width in places) along the northern site boundary, another ditch along part of the western site boundary and ditches running along two field boundaries within the site.

The River Nanny runs in an easterly direction approximately 2 km south of the site and surface water in the vicinity of the site appears to drain naturally through land drains, following the natural topography of the landscape towards the river. The River Nanny drains a catchment area of 180 km² and a hydrological station located at Duleek has estimated a dry weather flow of 0.04 m³/s and a 95 percentile flow of 0.25 m³/s. The river is not a designated salmonid river under the 1988 European Communities (Quality of Salmonid Waters) Regulations but a number of angling clubs use the river for trout fishing.

2.6 SUMMARY

The site is located in an area which has for a long period been intensively managed for agricultural purposes. This has resulted in a limited number of habitats on the site and consequently a low diversity of flora and fauna. The types of flora and fauna encountered on the site are typical of the agricultural area in which the site is located. The main ecological interest at the site lies in the hedgerows which although of limited ecological value due to the low species diversity and poor structure do provide some value to local wildlife. No habitats of regional or national importance are present, only of low importance locally. No rare, threatened or legally protected plant species were encountered on the site and no part of the site or its immediate surroundings is covered by a scientific or conservation designation as recognised by Dúchas.

ATTACHMENT NUMBER C5

Human Beings

Contents

Attachment C5.1

Existing Human Environment

Attachment C5.2

Figure C5.1: Aerial Photograph showing Land Uses

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Attachment C5.1

Existing Human Environment

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C5.1 EXISTING HUMAN ENVIRONMENT

1. INTRODUCTION

This section describes the existing human environment in terms of land-use, population and employment and assesses the likely impacts on the human environment arising from the proposed development.

2. EXISTING ENVIRONMENT

2.1 LAND USE, ZONING AND HOUSING

The site is located in the townland of Carranstown approximately 3 km north-east of Duleek village. The R152 secondary road between Duleek and Drogheda runs along the southern boundary of the site. A commercial freight railway runs within 50-100 metres of the northern boundary of the site. The railway line, which originates in Navan and joins the Dublin line at Drogheda is used to transport freight for Tara Mines, Navan and the Platin cement factory.

The land uses in the surrounding area are shown in Figure C5.1. As can be seen from Figure C5.1, the land use in the area is predominantly agricultural with the exception of the Platin cement factory and its associated quarry located to the north-east of the proposed development site.

The area does not have any specific land zoning in either the existing (1994) or proposed (2000) Meath County Development Plan and is considered rural and agricultural. According to the development plan rural and agricultural areas 'can absorb quite effectively designed and located development in all categories including masts and wind energy installations, afforestation and agricultural structures'. One of the development objectives in the Development Plan for rural areas is to 'ensure that commercial and industrial proposals for rural areas are sustainable'. The closest industrial zoned lands are the proposed Industrial Park close to Duleek on the R152 and in the Drogheda environs.

Housing development in the area is scattered in nature and is typical of a rural area. There is ribbon housing development along the R152 to Duleek to the south-west of the proposed site. The closest residential dwellings to the site are a dwelling adjacent to the boundary at the eastern corner of the site and two dwellings located across the R152 to the south of the site. There is also a group of four dwellings located across the R152 road from the eastern corner of the site and a further group of dwellings include two farm houses located about 400 metres to the north-west of the site across the railway line.

Other buildings in the area include a primary school, Mt. Hanover, which is located about 1 km to the east of the proposed development site. There are two commercial premises (tyre centre and garage) located across the R152 road from the eastern corner of the site and a public house, Carranstown Lodge is located approximately 500 m south west of the site on the R152. Adjacent Carranstown Lodge is a local football club.

2.2 POPULATION

Meath is located in the fastest growing region in the country, the Mid-East region.

The closest population centres to the development site are Duleek village to the south-west and Drogheda town to the north east. Carranstown is located within Duleek District Electoral Division (DED). The most recent national census population figures (1996) for Duleek DED and the adjacent St Mary's DED and Drogheda are presented in Table 2.1 below.

Table 2.1 Population Levels in Development Area

Area	1991	1996	Change in Population
Duleek DED	2496	2434	-62
St Mary's DED	3267	3529	+262
Drogheda	24656	25282	+626

The population of Duleek village itself has shown steady growth in recent years and the present population is estimated to be in excess of 1,800.

2.3 EMPLOYMENT

The Mid East region in which Meath is located is growing particularly strongly with increases in its output outperforming the Dublin area by a factor of almost 2:1. This growth has manifested itself in terms of employment growth in the county (up to 20% in the 1991-1996 period) and a fall in unemployment (over 10% drop 1991-1996).

The most recently available employment figures for the Mid-East region and the State from the Quarterly National Household Survey (QNHS) are presented in Table 2.2 below:

Table 2.2 QNHS Employment figures (December 1999 - February 2000)

Area	1999	2000	Change	% Change
Mid-East	183,600	176,300	7,400	4.0 %
State	1,732,100	1,650,600	81,500	4.7 %

The live register statistics are maintained on a monthly basis and give the most up to date information on unemployment levels. There are a couple of problems in attempting to accurately quantify unemployment levels for the area in which the site is located based on these statistics. Firstly the live register measures casual, part-time and seasonal workers who claim benefit or assistance and therefore is not a true indication of unemployment. Secondly live register statistics are compiled based on information from the local employment office which does not correspond to specific geographic boundaries and therefore registrants at a given local office do not necessarily come from a particular area.

The employment office in Drogheda in Co. Louth is the closest employment office to the proposed development site and Navan, Co. Meath is the second closest office. Table 2.3 details live register numbers for these two offices for April and May 2000.

Table 2.3 Live Register Statistics for Drogheda and Navan Employment Offices

Employment Office	April 2000	May 2000
Drogheda	2,577	2,404
Navan	1,361	1,226

The 1996 National Census employment figures for Duleek District Electoral Division give a breakdown by category of employment as detailed in Table 2.4.

Table 2.4 Duleek DED Employment Category Figures 1996

Category of Employment	Employed	Unemployed
Agriculture	98	18
Manufacturing	185	44
Construction	110	49
Clerical	68	5
Public Administration	38	1
Transport	58	6
Sales	73	14
Professional	90	5
Services	66	9
Other	58	39
Total	844	190

According to the draft Meath County Council Development Plan 2000, a substantial portion of the population of Duleek is employed in manufacturing industry such as the nearby Platin Cement Works which is the largest employer in the immediate vicinity.

Much of the surrounding land is used for agricultural purposes and it is likely that a proportion of the population are employed in the agricultural and associated sectors. Likewise a proportion of the local economy would be dependent on agriculture.

2.4 AMENITIES AND TOURISM

The land in the immediate vicinity is predominantly privately owned agricultural land and therefore does not have significant amenity value for members of the general public. The closest natural recreational area to the development site is the area around Bellewstown Hill located about 4 km south of the site which has a listed viewing point over the area. Other natural recreational areas close to the development site are around Newgrange and Dowth Megalithic Cemetery and the Boyne River Valley located 4-5 km to the north west of the site.

The area does not possess any noteworthy scenic amenity value and the Platin cement works has a significant negative impact on the scenic quality of the area. In the draft County Development Plan the area is classified as 'Rural and Agricultural'. This is described in the development plan as 'normal rolling lowland pastoral landscapes that apart from occasional ridges or prominent areas are not particularly visually sensitive' and these areas 'can absorb quite effectively designed and located development in all categories including masts and wind energy installations, afforestation and agricultural structures'. The closest 'Areas of Visual Quality' to the proposed development site are the 'Lower Boyne Valley' located about 2 km to the north and the 'River Valleys' located about 2 km to the south.

2.5 PUBLIC CONCERNS

A number of different issues have been raised by the public, mainly in relation to the construction and operation of the waste to energy plant. The main concerns are summarised below:

2.5.1 Dioxins

There is public concern about dioxins being emitted from the waste to energy plant.

Chemically, dioxins refer to a large group of structurally similar compounds that include both dioxins and furans. Dioxins consist of 75 individual compounds and furans include 135 different compounds. Of the 75 individual dioxins only 7 of these are considered toxic, similarly of the 135 furans only 10 are thought to have dioxin like toxicity. The most toxic and the most researched dioxin is 2,3,7,8- tetra-chloro-dibenzo-dioxin; this compound is used as a reference for which the toxicity of the other compounds are referenced.

Dioxins have always been present as a by-product of the combustion of wood and coal, their formation in the temperature range of between 2000 C and 8000 C corresponds to the "low temperature" burning range often occurring in domestic home heating and from back garden/ forest fires. A European Dioxin Inventory Study in 2000 demonstrates that 25 grams I-TEQ of dioxin was produced in Ireland and of this 22 grams came from non-industrial sources, primarily home heating and transport.

Industrial sources have since the end of the 19th Century also contributed to the production of dioxins; such industries include, the production of steel/ copper, the incineration of waste and coal/ oil power plants. Early waste incineration plants provided little or no means for the cleaning of gases produced during combustion and as a result elevated levels of dioxins and other gases were emitted from these facilities for many years. Increased levels of environmental awareness coupled with a greater

knowledge of the impacts of dioxins on the environment forced many of these dated incinerators to close.

Today, these old incineration plants have been replaced by modern Waste-to-Energy facilities that are capable of meeting stringent emission limits complying to new legislation (EU 2000/76) whilst also providing energy recovery from the waste material. Because of the advances in technology new Waste-to-Energy facilities are located in both urban and rural areas. Indeed, according to the World Health Organisation (WHO), modern incinerators may be permitted at distances as low as 300 –500 meters from residential areas.

The reduction in the number of old plants has been offset by the increased capacity of the new Waste-to-Energy facilities, incineration capacity in Europe has increased from 32.7 million tonnes per year in 1996 to 46.7 tonnes per year in 2000. This value is expected to rise to almost 62.8 million tonnes per annum by 2006, with the total installed base of plants expected to rise to 474.

Modern incineration plants are required to operate under strict emission limits, in Europe the directive for waste incineration (2000/76/EC) has lowered the emission limit for dioxins to 0.1 nanogram/m³.

The new incineration Directive (EU 2000/76) will reduce emissions of dioxins and furans from incinerators in the European Union from an annual 2,400 grams in 1995 (out of approximately 5749 grams total dioxin emissions) to 10 grams after full implementation in 2005, or less than 1% of total dioxin emissions.

The proposed facility in Carranstown will operate a two stage Dioxin removal process thus ensuring the plant will operate well below the limits set out in the new incineration directive.

2.5.2 Dioxins and Human Health

Dioxins and Furans are considered biologically stable; this results in these compounds bio-accumulating and increasing in concentration as they pass through the food chain. The main exposure therefore to humans of dioxins arises from food ingestion. The majority of toxicologists are of the opinion that the entry of dioxins and furans into the environment and subsequently into the human food chain needs to be reduced as a precautionary measure.

The largest human exposure to dioxins occurred during an industrial accident in Seveso, Italy in 1976. During this incident over 5,000 people were exposed to approx. 3 kilograms of dioxin and of this 193 displayed symptoms of Choroacne, a skin condition associated with dioxin exposure. There have being no linked fatalities as a result of this exposure and in addition, no other noticeable effects were observed.

Cancer levels in Seveso have been studied and are, on average, lower than those witnessed during a similar study carried out in an industrial location in Germany.

However, the World Health Organisation has determined that dioxins are hazardous substances, and have recommended a tolerable daily intake (TDI) of 1- 4 picogram TEQ/ kg of body weight*. In 1997 the International Agency for Research on Cancer (IARC) classified dioxin as a known human carcinogen, it also stated that the

compound does not affect genetic material and there is a level below which cancer risk is negligible. The USEPA has stated that the risk of developing cancer from dioxin exposure may be as high as 1 in 100 for individuals that eat a high proportion of fatty foods, however members of the Peer group established to examine this claim have stated that this statistic was alarmist and unsubstantiated.

The new EU directive (2000/76/EC) takes into account recent studies on dioxins and their effects and the WHO recommendations.

The World Health Organisation have stated that 'The incineration of waste is an hygienic method of reducing its volume and weight which also reduces its potential to pollute'. 'In general, properly equipped and operated waste incinerators need not pose any threat to human health, and compared to the direct land filling of untreated wastes, may have a smaller environmental impact'.

Good occupational health can be ensured in Waste-to-Energy facilities by observing standard working practises. There are no critical occupational health aspects in waste incineration, which do not also apply to other waste management functions. When correctly maintained and operated, incineration is not believed to pose an increased threat to health for workers.

* It may noted that the current recommended T.D.I. for dioxins also includes dioxin- like PCB's in the calculation.

2.5.3 Other Concerns living close to an Incinerator

It has been said that it is unsafe to live in close proximity to an incinerator. Another concern of local public is that property prices will drop, and that incinerators threaten the well being of local communities, food production and tourism industry.

There are over 300 incinerators in Europe and many are located in the centre of towns and cities, for example, Vienna, Monaco and Paris. In the World Health Organisation's pamphlet on Incineration it states that "Modern incineration equipment fitted with air pollution control technology can make waste incineration an environmentally acceptable form of waste treatment, which minimises the potential for harm. It can therefore be possible to locate plants near to densely populated areas."

The U.K. National Society for Clean Air and Environmental Protection recently published a document entitled "The Public Acceptability of Incineration". In the document the subject of property prices in the vicinity of new incinerators is addressed – "Research in North America has shown that during the proposal, planning and construction stages for an incinerator (or any other large industrial project) there is a short-term impact on property values in the immediate vicinity. Much of this is as a result of the uncertainty while deliberations continue. Once the facility is operational, property values have been shown to recover".

2.5.4 Threat to Farming

Another concern is that incineration is a threat to farming. It has also been said that dioxins can traverse the food chain through deposition onto pastures and bioaccumulation.

Incineration plants are in operation throughout the world, with over 300 in Europe alone. The location of these facilities varies from industrialised to urban areas and into rural areas. WTE plants are located in Paris, Vienna, Monaco, Hamburg, Zurich, and Gien to name but a few. The occurrence of these plants throughout mainland Europe and the U.S. is such that incineration plants are frequently situated close to agricultural areas.

There is no known case in Europe whereby a food producer has had their produce refused by any food processing company or outlet as a result of the proximity of the producer to a modern incineration plant. In addition, there is no known policy in place by any food processing company or outlet stating that produce originating from lands located close to a modern incineration plant is to be refused acceptance by virtue of their origin.

There are six waste incinerators currently operating in Ireland. The Environmental Protection Agency has recently issued a report entitled "Dioxin levels in the Irish environment"; this report details the level of dioxins measured in cow's milk* taken at 25 locations throughout the country and in the vicinity of the incinerators in yr. 2000. The results of this report can be compared to a similar study also undertaken by the EPA in 1995. It is to be recorded that dioxin levels in the milk have fallen by approx. 16 per cent in the five year period, this reduction is in line with similar reductions in Europe.

In Belgium over 3 billion dollars worth of damage was caused to the food industry following the deliberate mixture of dioxin-like PCB's with animal foodstuffs. Incineration was used to dispose of the contaminated material that arose during this episode. Indaver's incineration plants were used for the destruction of this material. Dioxin levels in the vicinity were monitored throughout this process and there was no increase in levels recorded.

It has been stated that Ireland will be agriculturally uncompetitive as compared to New Zealand if incineration is introduced as a waste management option. There are currently six hazardous waste incinerators operating in Ireland without adverse affect on agriculture. In addition, the New Zealand government recently produced a report on dioxin production in their country. The report states that the major emitters of dioxins to the environment are uncontrolled landfill fires. The report states, "It is clear that landfill fires do occur at an unacceptable rate in New Zealand". The emission of dioxins in New Zealand is estimated at between 14 and 51 grams I-TEQ/yr, as compared to dioxins emissions in Ireland of between 25 and 39 grams I-TEQ/year.

* The EPA regards cow's milk as the best indicator of the presence of dioxins in the environment.

2.5.5 Incineration as a threat to Recycling

There is also concern that incineration poses a threat to recycling. It has been alleged that incineration relies on the continued generation of waste to support high operating costs, perpetuating the generation of waste and removing the incentive to recycle and re-use.

In response to this, it is worth observing the Flanders region of Belgium – the home of Indaver NV. In year 2000, the Flemish Waste Authority reported the highest rate of municipal solid waste recycling in any region in the world, at recovery rate of 66%.

This high **level** of recycling was achieved with the co-existence of a total yearly incineration capacity **of approx.** 1.2 million tonnes and by **implementing** a ban at landfill **for** untreated MSW – See figure 1 below. In addition, it is planned to increase the incineration capacity to approx. 1.6 million tonnes/ annum in order to ensure that no untreated **MSW** is disposed of to landfill..

Indaver **believes** in Integrated Waste Management, which follows the hierarchy of minimisation, recycling, composting, **incineration** and last of all landfill. The proposed incinerator is only one of a number of technologies required to tackle the **waste** management problem in Ireland and will dispose of less than **30%** of the waste produced in the North-East area. This leaves 70% of the waste produced in **these** regions available for other **technologies** including recycling. This will ensure that **pressure** remains to increase recycling and encourage **waste** minimisation

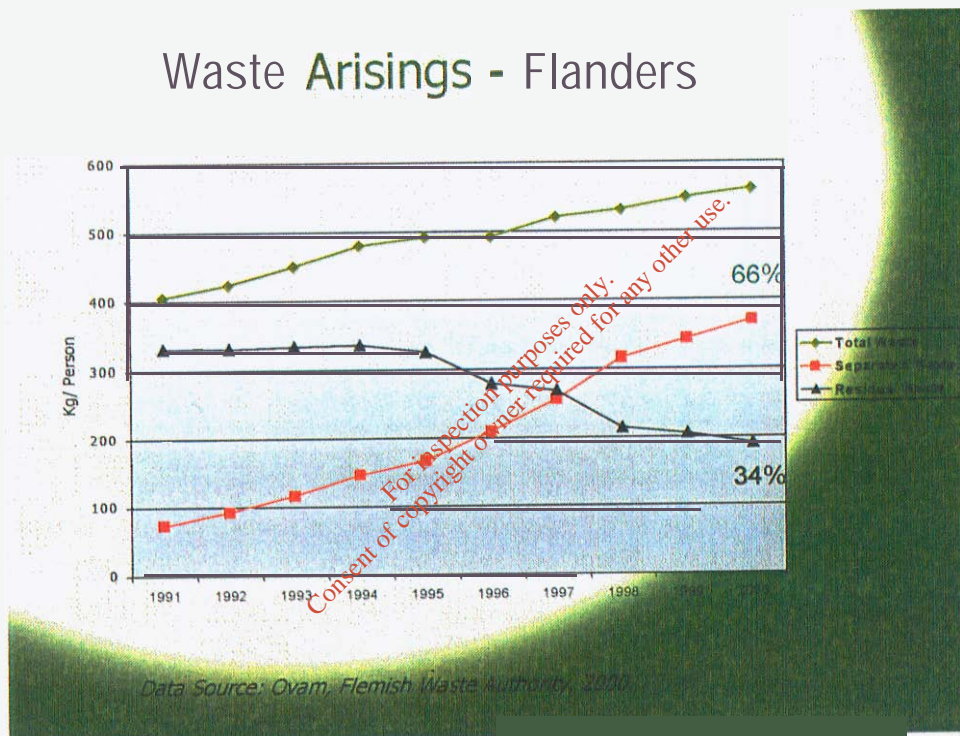


Figure 1 Waste Management in Flanders

2.6 COMMUNICATIONS

A Communications Register for **persons** requiring further information regarding the waste management facility was launched by **the** company at an early stage of the consultation process with regard to the proposed waste management facility. The **register** was formed, inviting any interested party to complete and **return** a **post-paid card**. To date, **249** names are on the register and regular **updates** on the status of the proposed development are posted to all concerned. Additionally Indaver Ireland operate a database of almost **600** names, this database is used to inform relevant parties of **Indaver** Ireland's status regarding the proposed **development of the** facility.

A Community Liaison Committee will be also formed as conditioned **by** Meath Co. Co. in their decision to grant planning **permission** for the facility. This committee **will**

consist of 8 people the make up of which has also been specified by Meath County Council. The eight members will consist of two staff members of Meath County Council, two elected members of Meath Co. Co., two members of the local community and two representatives from Indaver Ireland. Indaver have already begun the process of forming this committee by inviting individuals from the communications database to forward themselves for selection onto the committee.

As part of Indaver Ireland's communication programme, site visits to a similar Indaver waste to energy plant in Beveren, Flanders have been organised for interested parties. In addition, these visits also included tours of similar recycling plants. To date, approximately 60 people, many from the local area, have attended these visits.

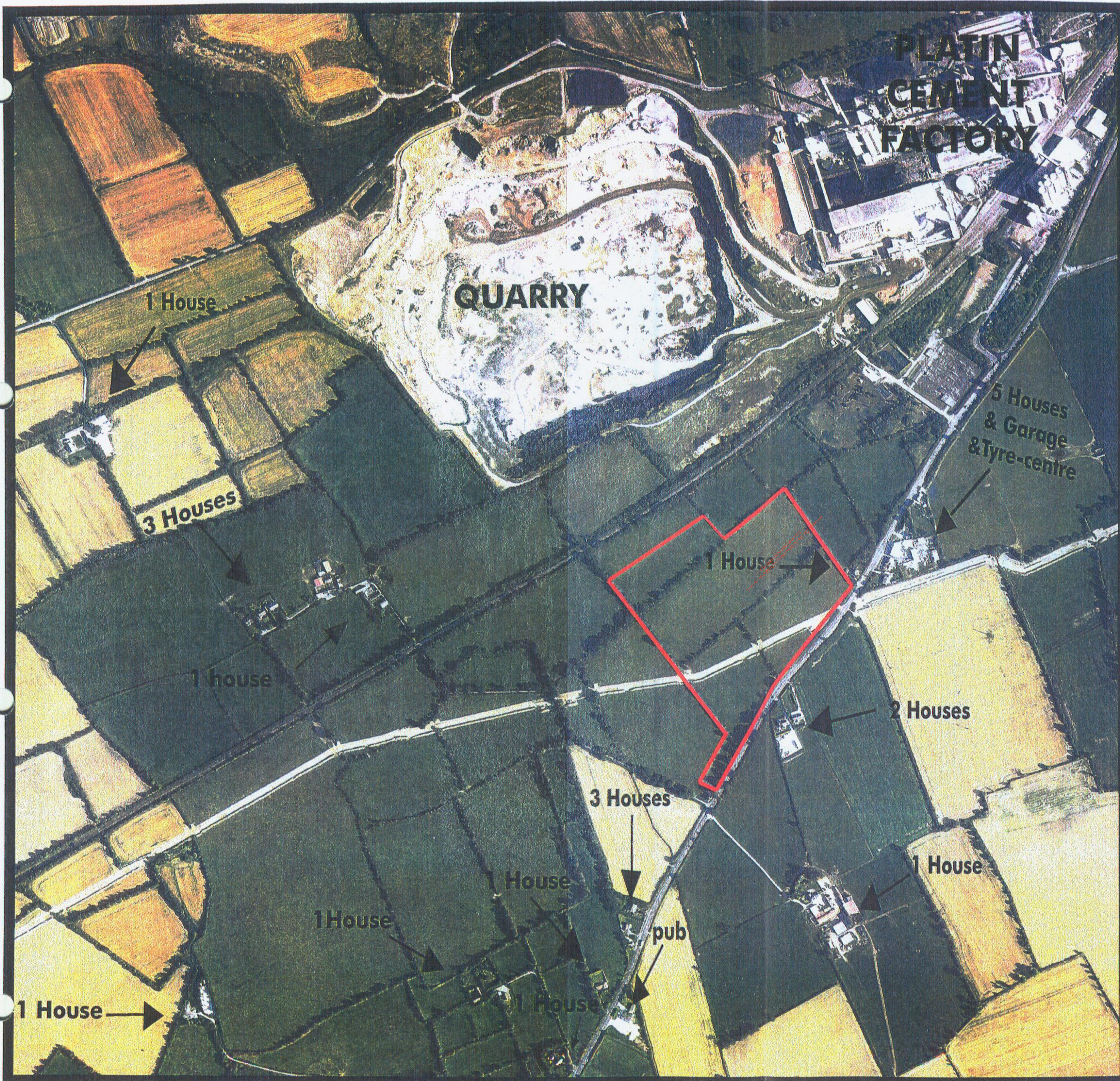
For further information on public consultation regarding this proposed development, see Section 1.4 of the EIS and Section 2.6 and Attachment G of the EIS Additional Information.

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Attachment C5.2

Figure C5.1: Aerial Photograph showing Land Uses

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Indaver Ireland Ltd



Project Management Group

Waste Management Facility,
Carranstown

Adjacent Land Uses