Granary House
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Tel. [021] 4321521
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environmental management for business.

No. 3.

ENVIRONMENTAL PROTECTION AGENCY
18 OCT 2005

Licensing Unit,
Office of Licensing & Guidance,
Environmental Protection Agency,
Headquarters,
P.O. Box 3000,
Johnstown Castle Estate,
Co. Wexford.

14th October 2005

RE: Notice in Accordance with Article 14(2)(b)(ii) & Article 16(1) of the Waste Management (Licensing) Regulations - Greenstar Ltd – Review Application Reg. No. 53-3

Dear Sir/Madam,

Please find enclosed, on behalf of Greenstar Ltd, an original and 2 no. copies of responses to the Notice issued under Article 16(1) of the Waste Management Licensing Regulations for the Waste Licence Review Application 53-3.

Also enclosed is an original and 2 copies of an addendum to the Article 14 response submitted to the Agency in July 2005. Since the July submission Greenstar has, in the course of an assessment of current and future site activities, identified a number of proposed operational and infrastructural changes at the facility that has required amendments to the information submitted in that Article 14 response.

16 no. copies of the information are also included on CD in PDF format as requested.

If you have any queries, please call me.

Yours sincerely,

Jim O'Callaghan

0307204/JOC/PS
Encs.
c.c. Mr. Micheal Geary, Greenstar Ltd.

email. info@ocallaghanmoran.com Website: www.ocallaghanmoran.com
O'Callaghan Moran & Associates. Registration No. 8272844U

greenstar
setting the standard

ADDENDUM TO

ARTICLE 14(2)(b)(ii) FURTHER INFORMATION

PARTICULARS AND EVIDENCE

FOR

GREENSTAR LTD

WASTE LICENCE APPLICATION NO. 53-3

Prepared For: -

Greenstar Ltd.,
La Vallee House,
Fassaroe,
Bray,
Co. Wicklow.

Prepared By: -

O' Callaghan Moran & Associates,
Granary House,
Rutland Street,
Cork.

13th October 2005

environmental management for business

Addendum To

Article 14(2)(b)(ii) Further Information

Particulars and Evidence

For

Greenstar Ltd

Waste Licence Application No. 53-3

Prepared For: -

Greenstar Ltd.,
La Vallee House,
Fassaroe,
Bray,
Co. Wicklow.

Prepared By: -

O' Callaghan Moran & Associates,
Granary House,
Rutland Street,
Cork.

13th October 2005

TABLE OF CONTENTS

PAGE

1. INTRODUCTION

On 28th July 2005 Greenstar Limited (Greenstar) submitted a response to a Notice issued by the Environmental Protection Agency (Agency) under Article 14(2)(b)(ii) of the Waste Management Licensing Regulations in relation to the application for the review of a Waste Licence, at Fassaroe, Bray, Co. Wicklow (Waste Licence Register No. 53-3).

Since the July submisison Greenstar has, in the course of an assessment of current and future site activities, identifed a number of proposed operational and infrastructural changes at facility that will require amendments to the information submitted in the Article 14 response. The assessment was triggered by the conditions of the planning permission (Ref. No. 04/1680) issued in July 2005 and a recently concluded agreeement with An Bord Gais in relation to the restoration of the area of the site underlain by a gas pipeline and associated wayleave. The proposed changes affect the waste water emissions and the restoration profile.

An assessment of the proposed wastewater emission from the facility to the foul sewer was provided in the July submission. At that time it was proposed to discharge surplus leachate from the biowaste composting area to the municipal sewer via a new foul sewer connection. Condition 6 of the recently issued planning permission prohibits the discharge of leacahte to the sewer. A copy of the planning permission is included in Appendix 1. An assessment of the impact of this prohibition on discharges to the sewer is included in Section 2.1 of this report.

An updated ecology report for the facility was included in the July submission. At the time it was proposed to complete the restoration of the site in accordance with the restoration plan specified in Condition 4 of the existing waste licence. This plan did not inlcude for restoration works over the gas pipline, as at the time it was prepared Greenstar had not recveived the approval of Bord Gais to carry out works over and adjacent to the pipeline.

However, Greenstar has recently reached an agreement with Bord Gais regarding the proposed method for protecting the gas pipeline and restoring the area occupied by the pipeline and associated way leave. This will allow the restoration of areas of the site previously exlcuded from consideration. A revised ecology report, which address the impacts of the amended restoration plan is included in Appendix 2 of this report.

Subsequent to the submission of the Article 14 response in July the Agency verbally requested a colour print of a drawing showing the proposed site boundary in red and an interpretation of the dust deposition monitoring results that had been submitted. The Drawing is included in Appendix 3 and the interpreation of the dust results is presented in Section 4.

2. COMPLIANCE REQUIREMENTS

2.1 Revised Wastewater Assessment

2.1.1 Existing & Proposed Drainage Systems

Sanitary wastewater from the facility toilets is currently directed to the on-site septic tank where it receives primary treatment. The partially treated effluent from the tank is pumped by a float control pump to a 4 modular Puraflo ™ biofiltration system for secondary treatment. The final effluent subsequently receives tertiary polishing in a percolation area.

Process wastewater currently generated at the facility comprises washwater from vehicle cleaning and washing of the floors in the transfer station buildings and in the compactor and loading area. The wash water from the vehicle wash drains into a sump, which is pumped out to a balancing tank that controls flows to the septic tank.

It is proposed to discharge all wastewater generated at the site except from the biowaste area to the new foul sewer installed on lands adjacent to the facility as part of commercial development project. The proposed connection point to the new sewer is shown on Drawing No. B9338-C002-B included in Appendix 3. The wastewater will discharge via a petrol/oil interceptor to the new sewer, which in turn connects to the municipal sewer that connects to the municipal wastewater treatment plant in Bray.

2.1.2 Proposed System - Biowaste Composting Plant

Process wastewater generated by the biowaste treatment plant will include two types: -

1. *Pre-sanitisation*; run-off from in-vessel biowaste treatment floor wash downs, blending operations in the reception building and leachate from the in-vessel units; and

2. *Post-sanitisation;* run-off from the Aerated Static Piles (ASP).

Wastewater generated in the reception building and the in-vessel units will be directed to a holding tank for recirculation at the blending stage. Run-off from the ASPs will be directed to a holding tank for settling and subsequent re-circulation to the ASPs. Excess run-off from the ASPs will be directed from this holding tank to a surplus storage tank from where it will be recirculated to the ASP's.

During normal operations all leachate generated in the reception building and in-vessel units will be re-used in the biowaste treatment process. On occasions, surplus leachate may be generated and in this event it will be directed to the surplus storage tank. The contents of this storage tank will be removed off-site to a wastewater treatment plant. The drainage layout for the biowaste treatment area is shown on Drawing No. B9338-C002-B.

2.1.3 Proposed System - Transfer Station Buildings, Wheel Wash Area, Compactor Area, Sanitary

It is proposed to discharge the existing process and sanitary wastewater generated at the site to the new foul sewer. The wastewater will be directed to the new pump sump located close to the existing biofiltration system from where it will be pumped to the new sewer. As the wastewater is already directed to this area of the site (to the septic tank and bio filtration area) the existing drainage pipework will continue to be used and will be connected to the new pump sump.

2.1.4 Volume and Quality

Biowaste Area

As the biowaste treatment system is typically a net water user the majority of the wastewater will be floor wash downs and the biowaste reception building. It is estimated that approximately up to 2 m^3 of process wastewater from the biowaste area will discharge to the surplus storage tank on a daily basis. The liquid will be removed from this tank for reuse in the process. If the volume exceeds the amount required for reuse in the composting process the surplus leachate will be removed to an off-site wastewater treatment plant.

The floor of the biowaste reception building will be swept before washing to remove large items. The floor drains will be provided with grids to prevent entry of large items into the drains. All oils and other chemicals will be stored in dedicated bunded storage areas, which will reduce the potential for accidental releases of oils or chemicals to foul sewers. Facility personnel will be trained in spill response actions and adequate spill containment and clean up equipment will be maintained on-site.

Storm water from the site will not be discharged to the foul drainage system. Automatic cut-off valves will be installed on the foul sewer drainage system before the connection to the new sewer to prevent the direct discharge of firewater run-off in the event of a fire on the site.

Sanitary / Canteen Discharges

The total number of employees on-site over a 24-hour period will be approximately 70. Based on a discharge rate of 220 litres/person/day, this equates to a dry weather flow of 0.18 litres/sec or approximately 15 m^3/day.

Transfer Buildings

Each of the waste transfer buildings will require floor washdown. This wastewater will be collected by a series of floor drains within the buildings. The volume of wash water is estimated at 250 litres per day per 500 m^2 floor area. The run-off from the existing transfer building will be 500 litres/day, from the Phase 1 transfer building 850 litres/day and from the proposed Phase 2 transfer building 1000 litres/day.

All wastewater from the transfer buildings will discharge to the new pump sump from where it will discharge to the municipal sewer. Tables E.3(i) and E.3(ii) of the waste licence application form are included in Appendix 4.

Table 2.1 indicates the likely quality of the process and sanitary wastewater from all relevant activities that will be discharged to the municipal sewer.

Table 2.1 Wastewater Quality

Parameter	Concentration
Temperature	42 °C
BOD	3 500 mg/l
COD	7 000 mg/l
pH	5 – 10
Ammoniacal Nitrogen	100 mg/l
Suspended Solids	2000 mg/l
Sulphates (as SO_4)	1000 mg/l
Detergents (as MBAS)	100 mg/l
Fats, Oils, Grease	100 mg/l

2.2 Revised Ecology Report

A copy of the revised Ecology Report for the site is included in Appendix 2.

2.3 Site Boundary Drawing

The proposed licence area is shown in red on Drawing No. B9338-C002-B in Appendix 3.

2.4 Dust Results Interpretation

The results for the monitorng events completed during the period June 2004 to January 2005 are shown on Table 1 and an interpretation presented below.

2004 June – July Event

Two of the gauges were contaminated, DS-1 with bird excrement and DS-3 with a mouse carcass on top of the protective mesh. Gauge DS-4 had been damaged during the reporting period by site operations. This gauge is located close to a C&I processing and stockpile area.

The dust levels at DS-2 (332 mg/m^2/day), which is located away from operational areas close to the stream that runs along the northern boundary of the facility, was below the deposition limit (350 mg/m^2/day).

2004 August – September Event

The dust emission limit specified in the Waste Licence was exceeded at all four monitoring locations. During the monitoring period there had been extensive construction works at the site associated with the development of Phase 1 of the new transfer building. Furthermore, approximately 50,000 tonnes of the C&D fines material recovered on-site had been placed on-site as part of the restoration works. There were dry periods during the monitoring event and there were occasions when high winds generated dusts from hardstanding areas, despite the fact that Greenstar had deployed and operated a water bowser to suppress dust.

2004 November – December Event

The dust emission limit specified in the Waste Licence was exceeded at one monitoring location (DS-04). This location is close to the C&I processing and stockpile area. Greenstar has provided a water spray system on the site wood chipper to control dust emissions from this source. It is proposed to relocate the C&I processing indoors upon completion of Phase 1, which will allow the effective control of dusts generated by this process.

December – January Event

The dust emission limit specified in the Waste Licence (350 mg/m^2/day) was marginally exceeded at one monitoring location (DS-02 - 359 mg/m^2/day). This location is removed from the operational areas and is close to the stream which runs along the northern boundary of the facility. It is considered likely that the elevated dust level at this location was due to the extremely windy weather conditions during the reporting period.

Dust Monitoring Fassaroe 2004

Table 1

Location Number	WLA Licence Dust Deposition Limit	Jun-Jul 04	Aug-Sept 04	Nov-Dec 04	Dec 04-Jan 05
	(mg/m2/day)	Dust (mg/m2/day)	Dust (mg/m2/day)	Dust (mg/m2/day)	Dust (mg/m2/day)
DS-1	350	Gauge Contaminated	1690 (366 mg organic, 1324 mg inorganic)	82 (40 mg organic, 42 mg inorganic)	202 (47 mg organic, 155 mg inorganic)
DS-2	350	332 (80 mg organic, 252 mg inorganic)	488 (132 mg organic, 356 mg inorganic)	135 (22 mg organic, 113 mg inorganic)	359 (58 mg organic, 301 mg inorganic)
DS-3	350	Gauge Contaminated	368 (112 mg organic, 256 mg inorganic)	167 (47 mg organic, 120 mg inorganic)	272 (99mg organic, 173 mg inorganic)
DS-4	350	Gauge Damaged	1220 (324 mg organic, 896 mg inorganic)	2555 (364 mg organic, 2191 mg inorganic)	Gauge Damaged

APPENDIX 1

Planning Permission

Comhairle Chontae Chill Mhantáin
WICKLOW COUNTY COUNCIL

Aras An Chontae
Cill Mhantáin
Telefón : (0404) 20148
Fax No : (0404) 69462
Intl VPN : 181 2100
E-Mail: plandev@wicklowcoco.ie
Web: www.wicklow.ie

E. G. PETTIT + CO.
DUBLIN
RECEIVED
-7 JUL 2005

Your Ref:

Our Ref:

PLANNING & DEVELOPMENT ACTS 2000 - 2002

NOTIFICATION OF DECISION TO GRANT

CIRCULATION
TBOL
JSHB

Greenstar Ltd.
C/o E. G. Pettit & Co.,
P.O. Box 893,
Shelbourne,
Dublin 4.

DC

Planning Register Number: 04/1680

Valid Application Received: 18/10/2004

Further Information Received Date: 08/06/2005

In pursuance of the powers conferred upon them by the above-mentioned Act, Wicklow County Council has by Order dated 05/07/05 **decided to GRANT PERMISSION for development of land, namely:-**

Biowaste treatment facility with reception warehouse, control room, batch reactor system & vacuum aerated static pile system at Fassaroe Bray

Subject to the 11 condition(s) set out in the attached schedule.

Signed on behalf of Wicklow County Council.

SENIOR EXECUTIVE OFFICER
PLANNING & ECONOMIC DEV

Date: 05/07/05

B8575 : 5 BIOWASTE TREATMENT FACILITY
fax to Martin Murray
@ 01 212 0007
4 pages. J Sharry

All correspondence should be addressed to the Senior Executive Officer, Planning and Economic Development
Seoltar gach comhfhreagras chuig Príomhfheidmeannach Forbartha Eacnamaíochta agus Pleanála

PLANNING AND DEVELOPMENT ACTS 2000 - 2002

Reference Number in Register: 04/1680

S C H E D U L E

Pursuant to the Planning & Development Acts 2000 - 2002, permission is hereby granted, having regard to the nature of the development, the established use and planning history of the site and the objectives of the County Wicklow Waste Management Plan 2000 - 2004, it is considered that, subject to compliance with the conditions set out in the schedule below, the proposed development would not seriously injure the amenities of the area, would not injure the amenities of properties in the vicinity, would be acceptable in terms of traffic safety and convenience, would not be prejudicial to public health, and would therefore be in accordance with the proper planning and development of the area.

1. This permission refers to the development as described in the documents lodged, as revised by the documents lodged on the 18th October 2004 and the 8th June 2005 save as the conditions hereunder require.

REASON: For clarification.

2. **Before development commences,** the developer shall pay the sum of €21,760 (updated at the time of payment in accordance with changes in the Consumer Price Index as published by the Central Statistics Office) to the Planning Authority as a contribution in respect of public infrastructure and facilities benefiting development in the area of the Planning Authority.

   The contribution sought is in accordance with Wicklow County Council's Development Contribution Scheme and Section 48(1) of the Planning and Development Acts 2000 to 2002.

REASON: The public infrastructure and facilities included in the Development Contribution Scheme will facilitate the development and it is considered reasonable that the developer should contribute towards the cost thereof.

3. **Before development commences,** the developer shall pay the sum of (a) €2,176 (b) €1,632 and (c) €1,088

(updated at the time of payment in accordance with changes in the Consumer Price Index as published by the Central Statistics Office) to the Planning Authority as a contribution in respect of (a) Bray Catchment Sewerage Scheme (b) Bray water supply scheme and (c) Bray Community Centre which benefit the proposed development.

In the case of expenditure that is proposed to be incurred, the requirement to pay this contribution is subject to the provision of Section 48(12) of the Planning and Development Acts 2000 to 2002.

REASON: The said works will facilitate the development and it is considered reasonable that the developer should contribute towards the cost thereof.

4. No development shall commence until a Waste Licence in accordance with the Waste Management Act 1996 has been granted for the development by the EPA.

REASON: In the interests of public health and proper planning and development.

5. **Prior to commencement of development** the following information shall be submitted to the planning Authority for the written agreement and approval;
(i) A legal agreement from Cosgrave Homes certifying that the applicant has legal interest to carry out the proposed works to the bank at the rear of the proposed facility.
(ii) With regards to the excavation of material to be removed from the site during the construction phase, full details of the quantity of waste soil estimated, details of the disposal site and the proposed route shall be agreed with the Local Authority.

REASON: In the interests of clarity and proper planning.

6. **No leachate** from the process shall be discharged to the public sewer. **Prior to commencement of development** the applicant shall submit to and agree in writing with the Planing authority revised details, which show that the leachate generated on sit can be adequately stored on site to ensure that there is no requirement to discharge "excess" leachate to the public sewer.

REASON: In the interests of public health to protect the capacity of the pubic sewer system.

7. The hours of operation of the facility shall be limited to between 08.00 and 18.00 hours Monday to Saturday inclusive, (excluding Bank Holidays).

REASON: To protect the residential amenities of the area during the operation of the proposed development.

8. Landscaping and fencing shall be carried out to the satisfaction of the Planning Authority. Details of all fencing and landscaping proposals shall be submitted to and agreed with the Planning Authority before development commences.

REASON: In the interests of visual amenity.

9. All electricity and telephone service lines shall be laid underground.

REASON: In the interests of visual amenity.

10. **PRIOR TO THE COMMENCEMENT OF ANY DEVELOPMENT**, the applicant shall lodge security with the Council for the satisfactory compliance with the conditions of this permission. This security is required by the Council for application at its absolute discretion if such conditions are not duly complied with to its satisfaction. In order to secure the return of this security, the applicant shall, on the completion of the development, submit a report, including photographs where appropriate, from a suitably qualified professional (with professional indemnity insurance) certifying that all conditions of this permission have been complied with in full. The security shall be given by a lodgment with the Council of the sum of €50,000.

REASON: To ensure satisfactory compliance with the conditions of this permission.

11. In all other regards, the development shall comply with the terms and conditions of Planning Register References 02/6265 and 03/9208.

REASON: In the interests of clarification and proper planning.

APPENDIX 2

Revised Ecology Report

Article 14(2)(b)(ii) Further Information

REVISED

Updated Ecology Report

Including List of Areas of Conservation

For

Greenstar Ltd

Waste Licence Application No. 53-3

Article 13 Compliance

Prepared By: -

O' Callaghan Moran & Associates,
Granary House,
Rutland Street,
Cork.

13th October 2005

TABLE OF CONTENTS

PAGE

1. INTRODUCTION

1.1 Introduction

In April 2003 the Environmental Protection Agency (Agency) issued a revised Waste Licence to Greenstar to operate its Materials Recovery and Transfer facility at Fassaroe Bray (Reg. No. 53-2). Greenstar applied in September 2004 to the Agency for a review of the Waste Licence. The Agency requested Greenstar to provide an updated ecology report for the facility including a list of areas of conservation within 10 kilometers of the facility detailing the distance from each area of conservation to the facility.

The report was submitted to the Agency in July 2005. Since the report was submitted Greenstar have reached an agreement with An Bord Gais regarding the proposed method for protecting the gas pipeline that runs through the eastern portion of the site. The presence of the pipeline and associated way leave has up to now prevented Greenstar from including this area in the plan for the overall restoration of the site. Greenstar has prepared an amended restoration plan for the entire site that incorporates the area occupied by the gas pipeline and associated wayleave.

This revised report assesses the ecological impacts of the revised restoration plan.

1.2 Ecology Report (1998)

The original ecology report concluded that the facility was not located within the boundaries of any designated sites. This includes sites of international importance, such as candidate Special Areas of Conservation (cSAC's), and Special Protection Areas (SPA's) for birds, and sites of national importance, such as proposed Natural Heritage Areas (pNHA's).

Four areas of habitat were distinguished in the site: -

1. Sand Cliffs.
2. Bare waste ground.
3. Scrub habitat in 'lower' quarry.
4. Aquatic habitat (fringing stream).

No species of regional, national or international importance were found. The only communities of note were the seasonal nesting sand martins on the sand cliffs along the site boundary and the scrub area in the 'lower' quarry near the Glenmunder River. The scrub area is covered with common species such as ash, bramble and dog rose. The flora and fauna of

the 'waste land' is considered typical of these areas i.e. a range of pioneer plants, which can tolerate a range of soil types and conditions.

The ecological report categorises the site as a 'site of limited wildlife interest' in accordance with the surveying methodology used i.e. Phase 1 habitat survey (*sensu* Nature Conservancy Council, UK). The habitat survey figure included in the original ecology report is shown on Figure 1.1.

1.3 Site History

Waste has been deposited at the site since 1947. In August 1998 Noble Waste Disposal Ltd applied to the Agency for a Waste Licence to operate the site as a waste recovery and transfer station and an inert landfill. The Agency issued a licence for these activities on 22nd December 1999 (Waste Licence Reg. No. 53-1).

On 3rd April 2003 the Agency granted a revised Waste Licence for the facility (Waste Licence Reg. No. 53-2). The revised licence allows the use of inert construction and demolition waste in the reclamation and restoration of the partially infilled areas of the site. In September 2004, Greenstar submitted an application to review this licence.

The existing site layout is shown on Figure 1.2. The site is currently covered by two waste transfer buildings, access roads, landscape mounds, materials processing areas, stock piles, processing plant, skips and trucks, hardstanding areas, car park, weighbridge, fuel storage and waste quarantine bunded area, vehicle maintenance shed, offices and toilet facilities for administrative staff.

1.4 Site Developments

Since 1998, a new transfer building, hardstanding for the Commercial & Industrial waste processing area, a car park, a vehicle maintenance area, staff offices, weighbridge, access roads and a bunded area have been constructed at the facility. All of these works have taken place in areas of the site described in the original ecology report as 'waste ground' and in accordance with plans submitted to the Agency and planning permission granted by Wicklow County Council.

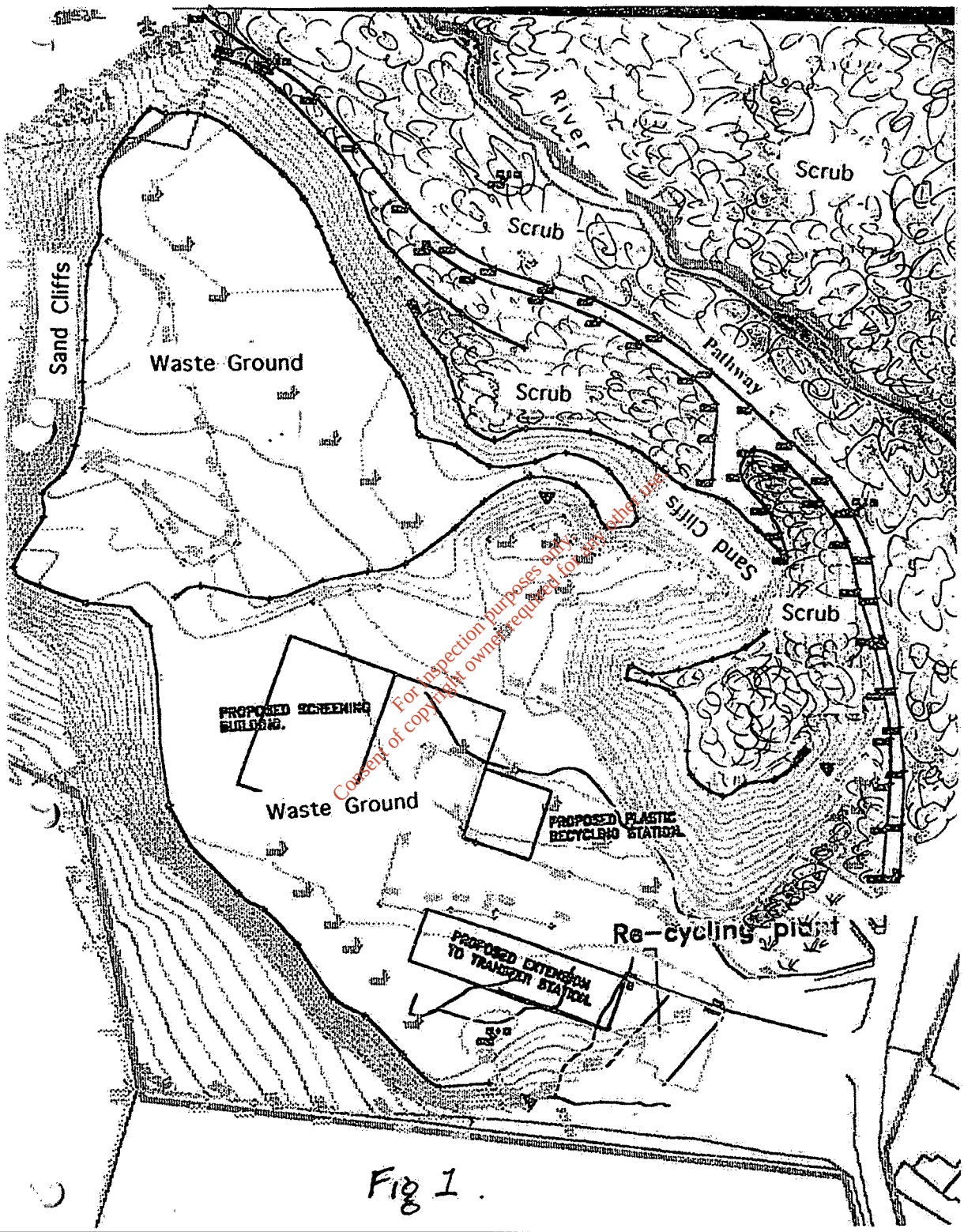

Fig 1.

O' Callaghan Moran & Associates.
Granary House, Rutland Street,
Cork Ireland.
Tel. (021) 4321521 Fax. (021) 4321522
email : ocm@indigo.ie

CLIENT: Greenstar Fassaroe

TITLE: Habitat Survey 1998

Details

O.S. Licence Agreement Number AR 0038702

Ordnance Survey Ireland. Government of Ireland.

FIG. No: 1.1

Scale: NTS

Rev.: A

A	25/07/05	Article 14	MW	JOC	BM
REV	DATE	DESCRIPTION	DRN	CHKD	APP

O' Callaghan Moran & Associates.
Granary House, Rutland Street,
Cork, Ireland.
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email : ocm@iol.ie

This drawing is the property of O'Callaghan Moran & Associates and shall not be used, reproduced or disclosed to anyone without the prior written permission of O'Callaghan Moran & Associates and shall be returned upon request.

NOTES

CLIENT
GREENSTAR

TITLE
SITE LAYOUT

SCALE NTS A4

FIGURE 1.2

REV. A

DOS Filename : DOSFILENAME

The area to the north of the existing car park has been restored and is currently used for the storage of new wheelie bins and for truck parking. This area, encompassing approximately 3500 m^2, was described as 'scrub' in the 1998 report. The lower part of the former quarry north of this area described as 'scrub habitat' and the 'aquatic habitat' along the stream has not been developed.

Greenstar have amended the restoration plan for the site. Details of the plan are included in the Article 16 response that accompanies this report. The revised plan includes for the restoration of the area occupied by the gas pipeline way leave. This includes the eastern section of the site and the lower part of the former quarry described as 'scrub habitat' in the 1998 report. The revised plan includes a provision to retain the 'aquatic habitat' bordering the stream. The proposed restoration works will bring the level of the partially filled area of the site up to the formation level of the existing transfer building and landscape measures will then be implemented.

1.5 Areas of Conservation

Table 1.1 lists the areas of conservation located within ten (10) kilometres of the facility boundary. Site synopses for each of the areas obtained from the National Parks and Wildlife Service (formerly Duchas) are included in Appendix 1.

The closest designated site to the facility is Ballyman Glen located approximately 0.75 km to the north. This site is a candidate SAC selected for alkaline fen and petrifying springs. The glen contains a small strip of fen which runs along the Wicklow county boundary and extends into County Dublin.

Table 1.1: List of Areas of Conservation

Site Name	Site Code	Distance/Direction From G'Star Site
Ballyman Glen	000713	**.75km North**
Bray Head	000714	**3.6km East**
Carriggower Bog	000716	**9.5km South**
Glen of the Downs	000719	**6.1km South East**
Kilmacanoge Marsh	000724	**3.5km South**
Knocksink Woods	000725	**2km West**
Dargle River Valley	001754	**1km south**
Great Sugar Loaf	001769	**2.4km South**
Powerscourt Waterfall	001767	**5.7km South West**
Powerscourt Woodland	001768	**2km South West**
Glencree Valley	001755	**5km South West**
Wicklow Mountains SPA	004040	**6.8km South West**
Wicklow Mountains SAC NHA	002122	**6.8km South West**

1.6 Impact Assessment

The proposed increase in waste inputs will not require the provision of any additional infrastructure and the processing will not impact on any ecosystem within or outside the facility.

The proposed biowaste treatment plant is in the area of the site described as 'waste ground' in the ecological survey. This area of the site is currently used to stockpile processed C&D material and is therefore constantly subject to disturbance and movement. The development of the biowaste treatment plant will not result in any impact on any significant ecosystem within or outside the facility boundary.

The revised restoration plan will involve the loss of the area described as 'scrub' along the eastern boundary. This area has already been significantly disturbed due to the installation of the Bord Gais pipeline and the loss of this habitat is considered insignificant. Provision has been made to maintain a buffer (approximately 10 m) between the base of the restoration and the Glenmunder Stream thereby protecting the 'aquatic habitat' along by the stream. The restoration plan will not result in any impact on any significant ecosystem within or outside the facility boundary.

1.7 Mitigation Measures

As the proposed changes to site activities will not result in any significant ecological impacts mitigation measures are not required.

APPENDIX 1

Site Synopsis

SITE SYNOPSIS

SITE NAME: KILMACANOGE MARSH

SITE CODE: 000724

This site is located off the main Dublin to Wexford road, just south of Kilmacanoge and at the base of the Great Sugarloaf. A small stream links the site to the Great Sugarloaf NHA. The site is a well-developed mosaic of wet woodland surrounded by poor fen and wet grassland.

A stream flows through the site in a northerly direction. The whole area is very wet due to the presence of numerous springs and seepage areas, arising from run-off from the Sugarloaf on the western side of the site and Kilmurry on the eastern side.

The wet woodland is mainly of dense Alder (Alnus glutinosa) and Willow (Salix atrocinerea). Plant species of the open areas of wet grassland and poor fen includes Purple Loosestrife (Lythrum salicana), Meadow Sweet (Filipendula ulmaria), Common Spotted-Orchid (Dactylorhiza fuchsii), Reed Canary-grass (Phalaris arundinacea), rushes (Juncus effusus, J. acutiflorus) and Great Horsetail (Equisetum telmateia). Many small sedges occur within the site including Carex paniculata, C. panicea, C. nigra, C. hirta and C. remota. Plants recorded in the wetter areas include Bogbean (Menyanthes trifoliata), Ragged Robin (Lychnis flos-cuculi), Marsh Marigold (Caltha palustris), Water Mint (Mentha aquatica). The site is of international importance on account of the fen/fen carr invertebrate communities, which includes two species of fly endangered within the European Union - (Oxycera falleni and Oxycera morrisii, Order Diptera). Another scarce fly species, Parhelophilus consimilis, Order Diptera, has been recorded.

The site is vulnerable to drainage and fen carr clearance from farming activities and to pollution of the stream by up-stream adjacent dwellings. The proposed widening of the Dublin-Wexford road could alter the hydrology of the system.

This site is important in having a diversity of species-rich wetland habitats within a relatively small area, and particularly for the presence of some rare invertebrates.

16th February 1995.

SITE SYNOPSIS

SITE NAME: DARGLE RIVER VALLEY

SITE CODE: 001754

This site is located about 2 km south-east of Enniskerry It is a section of the River Dargle with steep wooded banks. At one point along the river a well exposed series of Ordovician volcanic rocks are faulted against well-exposed Bray group Cambrian strata. Such a clear exposed junction is not seen elsewhere in Co. Wicklow.

The area is dominated by mature Oak (Quercus petraea) woodland, with some Hazel (Corylus avellana), Beech (Fagus sylvatica), Birch (Betula spp.) and Holly (Ilex aquifolium). Pockets of mature conifers occur in places, as well as Laurel (Prunus laurocerasus). The ground flora is rather sparse and mainly of Wood Rush (Luzula sylvatica) and Blackberry (Rubus fruticosus agg.).

The steep gorges over the river hold a luxuriant growth of mosses, while species common along the river bank include Red Campion (Silene dioica), Yellow Pimpernal (Lysimachia nemorum), Marsh Hawk's-beard (Crepis paludosa), New Zealand Willowherb (Epilobium brunnescens) and Giant Fescue (Festuca

gigantea).

A Red Data Book species, Yellow Archangel (Lamiastrum galeobdolon), occurs along the river. This is a very localised species confined to eastern Ireland.

The importance of this site is that it is a fine example of a wooded valley. It is likely that this valley has been wooded for a long period and such habitats are becoming rare in north County Wicklow. The removal of the conifers would increase the interest of the site. The site is also of considerable geological importance.

15th February 1995.□

SITE SYNOPSIS

SITE NAME: GLENCREE VALLEY

SITE CODE: 001755

The Glencree valley is a glacial valley which lies at the north eastern edge of the Wicklow mountains. The Glencree river, which flows through the valley, is a good example of a fast flowing upland river with many boulders and often brown peaty coloured water.

The site includes three areas of deciduous woodland which flank the river. The main tree species in the woods is Oak (Quercus petraea), with Ash (Fraxinus excelsior) and Birch (Betula pubescens) locally abundant. The shrub layer in the woods is variable. Holly (Ilex aquifolium), Birch (Betula pubescens) and young Beech (Fagus sylvatica) are the most common species. The field layer is generally sparse, and includes Wood-sorrel (Oxalis acetosella), Bracken (Pteridium aquifolium) and Wood-rush (Luzula sylvatica). Mosses are fairly abundant - these form carpets over the boulders. The moss species include Polytrichum commune, Rhytidiadelphus spp. and Thuidium tamarascinum.

In places Hazel (Corylus avellana) is common and here the field layer is more diverse with Bluebells (Hyacinthoides non-scripta), Ramsons (Allium ursinum), Dog Violet (Viola riviniana), Herb Robert (Geranium robertianum) and Germander Speedwell (Veronica chamaedrys). Patches of Willow (Salix spp.) are found in the wetter areas.

Regeneration in the woods is generally poor due to grazing. Several deer were seen and numerous animal tracks traverse the site. Underplanting of the woods has taken place in some areas, notably with Hemlock (Tsuga heterophylla) and Scots Pine (Pinus sylvestris).

On the south side of the river between the wooded areas there are species-rich boggy flushes with clumps of Sphagnum moss (Sphagnum spp.) and areas dominated by Sedges (Carex spp.) and Rushes (Juncus spp.). Other species include Bog Asphodel (Narthecium ossifragum), Butterwort (Pinguicula vulgaris), Devil's-bit Scabious (Succisa pratensis), Milkwort (Polygala vulgaris) and occasional low hummocks of Heather (Calluna vulgaris), Bilberry (Vaccinium myrtillis) and Cross-leaved Heath (Erica tetralix).

The bird life of the valley has been examined recently. Dipper and Grey Wagtail breed along the river, while Jay, Long-eared Owl, Woodcock and Blackcap are present in the woods.

The importance of the site is that it is a good example of a deciduous woodland even though it is rather fragmented. The presence of an upland river and boggy flushes add to the habitat diversity of the site.

23/11/1995

SITE SYNOPSIS

SITE NAME: POWERSCOURT WATERFALL.

SITE CODE: 001767

This site is located at the eastern edge of the Wicklow mountains, about 6 kilometres from Enniskerry. The main feature of the site is a steep waterfall, approximately 100m. high, and down which the Dargle river cascades. At the base of the waterfall there is a small corrie and associated small moraines.

The waterfall is fringed on both sides by steeply sloping ground covered with a heathy vegetation consisting of Bilberry (*Vaccinium myrtillis*), Heather (*Calluna vulgaris*), Wood Sage (*Teucrium scorodonia*) and Bracken (*Pteridium aquilinum*). This develops into scrub in a few areas comprised of the following species; Birch (*Betula pubescens*), Rowan (*Sorbus aucuparia*), Holly (*Ilex aquilinum*) and Hawthorn (*Crataegus monogyna*). Filmy Fern (*Hymenophyllum wilsonii*) occurs in this area. An interesting bryophyte and lichen flora exists on the exposed rocks.

At the base of the waterfall the river Dargle meanders across fairly flat grassland. The banks of the river have a nice belt of Alder trees (*Alnus glutinosa*) and a scarce species of Hawkweed (*Hieracium* sp.) occurs.

Part of the grassland area is maintained as parkland for amenity purposes and includes some fine specimen trees. The barks of some of these large trees notably the oaks (*Quercus petraea*) provide a niche for the rare lichen (*Lobaria pulmonaria*). The rest of the grassland is used for grazing and is dominated by Creeping bent grass (*Agrostis stolonifera*). In the wetter areas Purple Moor-grass (*Molinia caerula*) tussocks are common and where it is drier Bracken becomes abundant.

The slopes on the northwestern side of the site are covered by a mixed woodland with a fairly dense canopy. The main trees are Beech (*Fagus sylvatica*) and Oak (*Quercus petraea*). The shrubs and ground flora are generally sparse.

The rare Killarney Fern (*Trichomanes speciosum*) and a rare species of Myxomycete fungus, *Diderma lucidum*, have been recorded from this site but not in the recent past.

This site provided the first Irish breeding record for Redstart, and Ring Ouzel has also bred. However, neither species has been recorded in the recent past. A good variety of other woodland birds breed, as well as Raven.

This site is important because it has one of the most spectacular waterfalls in Ireland and it shows good exposures of schist and granite. The area is important botanically for its rare and scarce flowering plants, ferns, bryophytes and lichens.

31.3.1998

SITE SYNOPSIS

SITE NAME: POWERSCOURT WOODLAND

SITE CODE: 001768

Powerscourt Woodland is located about 2 km south-west of Enniskerry. It is largely contained within the two large demesnes of Powerscourt and Charleville, and includes a 4 km stretch of the Dargle River. The topography of the area is rolling hillside sloping down to the river. The site includes some parkland with large specimen trees.

Mixed woodland covers most of the site and includes both native and introduced species. Beech (*Fagus sylvatica*), Sycamore (*Acer pseudoplatanus*), Horse Chestnut (*Aesculus hippocastanum*) and many exotic conifers are among the introductions. The native Oak (*Quercus petraea*) and Ash (*Fraxinus excelsior*) are locally common. The shrub layers are variable, sometimes sparse where conifers predominate and otherwise with Holly (Ilex *aquifolium*), Elder (*Sambucus nigra*) and Honeysuckle (*Lonicera periclymenum*). Rhododendron (*Rhododendron ponticum*) and Laurel (*Prunus laurocerasus*) are locally abundant.

Typical plants of the ground layer include Bluebells (*Hyacinthoides non-scripta*), Ramsons (*Allium ursinum*), Herb Robert (*Geranium robertianum*), Wood Sanicle (*Sanicula europaea*), Enchanter's-nightshade (*Circaea lutetiana*), Germander Speedwell (*Veronica chamaedrys*), Wood Sorrel (*Oxalis acetosella*) and Dog Violet (*Viola riviniana*). The fern and moss floras are well developed in places; Powerscourt is also the site of a rare species of Myxomycete fungus, *Didymium clavus.*

The Dargle River holds a rich flora on its sandy and rocky banks. Species include Red Campion (*Silene dioica*), Tufted Wheatgrass (*Agropyron caninum*), Wood Fescue (*Festuca gigantea*), Wood Brome (*Bromus ramosus*), Goldilocks (*Ranunculus auricomis*) and Wood Rush (*Luzula pilosa*). Exposed areas in the centre of the river hold Coltsfoot (*Tussilago farfara*), Water Mint (*Mentha aquatica*), Welsh Poppy (*Meconopsis cambrica*), Remote Sedge (*Carex remota*) and Purple Loosestrife (*Lythrum salicaria*). There is some wet woodland associated with low-lying areas of the Dargle - Alder (*Alnus glutinosa*) is the predominant tree species. There are many tributaries to the Dargle at the southern end of the site. They flow through small steep-sided ravines, which are often covered in a Hazel (*Corylus avellana*) dominated scrub/woodland.

Although the site includes many exotic plant species, the habitats are still of interest and support an interesting flora. The mix of semi-natural habitats and estate woodland is particularly conducive to macro-fungi. The well documented record of land management practices held by the demesnes adds to the scientific interest. The area is also of great educational value, being frequently used for teaching.

31.3.1998

SITE SYNOPSIS

SITE NAME: GREAT SUGAR LOAF

SITE CODE: 001769

The Great Sugar Loaf is situated about 5 km southwest of Bray. It is a steep mountain, 501 m above sea level, and has been modified greatly by glacial erosion. It stood as a nunatak which was scoured by the Ivernian, Midland and Mountain ice sheets. Its profile thus contrasts with those of a Bray Head and Howth, both over-ridden by ice sheets and flat on top.

The main habitats of the site are dry mountain heath and upland grassland. The lower slopes are dominated by Gorse (Ulex europaeus and U. gallii), but Heather (Calluna vulgaris), Bilberry (Vaccinium myrtillus) and Cross-leaved Heath (Erica tetralix) also occur and become more frequent on the upper slopes. Bracken (Pteridium aquilinum) is found in dense patches amongst the Gorse.

The heath grades into upland grassland in places; grass species include Nardus stricta, Festuca ovina and Agrostis capillaris. The wetter grassland areas have rushes (Juncus spp.), sedges (Carex spp.) and mosses (Sphagnum spp.). Exposed rocky outcrops or areas of scree occur on the

mountain sides, especially on the eastern slopes. The lichen and moss communities are well developed in these places, with species of Cladonia spp., Dicranum spp. and Polytrichum spp..

An area of woodland, known as the Quill, occurs on the lower eastern slope. This is secondary woodland dominated by Oak (Quercus petraea), Birch (Betula pubescens) and Holly (Ilex aquifolium). Part of the woodland is wet, with Birch as the dominant species and a ground flora more characteristic of wet heath. The wet seepage areas within the wood have Purple Moor Grass (Molinia caerulea), Bog Asphodel (Narthecium ossifragum), Pondweeds (Potamogeton spp.) and mosses (Sphagnum spp.). A rare liverwort, Cryptothallus mirabilis, has been recorded beneath the Sphagnum layer. The stream running from the woodland provides a hydrological link with another Natural Heritage Area, Kilmacanoge Marsh.

The site is of both ecological and geological interest, and is also a prominant feature in the landscape of north County Wicklow. Because of its ease of access and close proximity to large urban areas, the Great Sugar Loaf is a valuable educational and recreational asset.

15th February 1995.□

Ballyman Glen (000713)

SITE NAME: Ballyman Glen

SITE CODE: 000713

Ballyman Glen is situated approximately 3 km north of Enniskerry. It is orientated in an east-west direction with a stream running through the centre. The glen is bounded mostly by steeply sloping pasture with Gorse (Ulex europaeus) and areas of wood and scrub.

This site is a candidate SAC selected for alkaline fen and petrifying springs, both habitats listed on Annex I of the EU Habitats Directive.

The glen contains a small strip of fen, which runs along the county boundary and extends into County Dublin. This fen is very alkaline and is associated with petrifying spring/seepage areas that have given rise to thick deposits of marl. The vegetation of the main part of the fen is dominated by Greater Tussock-sedge (Carex paniculata), Tall Fescue (Festuca arundinacea), Butterworts (Pinguicula vulgaris and P. lusitanica), Black Bog-rush (Schoenus nigricans) and Broad-leaved Cottongrass (Eriophorum latifolium). The site is particularly notable for its orchids, which includes Early Marsh-orchid (Dactylorhiza incarnata), Narrow-leaved Marsh-orchid (D. traunsteineri) and Marsh Helleborine (Epipactis palustris). In addition, twenty species of sedge have been recorded in the area, including the scarce Long-stalked Yellow-sedge (Carex lepidocarpa). The fen area is being invaded by Downy Birch (Betula pubescens). Associated with the fen, and also with the woodland elsewhere in the site, are petrifying springs. These lime-encrusted seepage areas are rich in bryophytes including such diagnostic species as Great Horsetail (Equisetum telmateia), Cratoneuron commutatum and C. filicinum.

Wet woodland and scrub occur along the margins of the stream for most of the length of the glen, extending outwards in areas to create inaccessible and species-rich patches of woodland. The canopy is dominated by Alder (Alnus glutinosa), Willow (Salix spp.) and Ash (Fraxinus excelsior). The woodland has a dense shrub layer which includes Hawthorn (Crataegus monogyna) and Spindle (Euonymus europaeus), and a diverse ground flora with Marsh Hawks-beard (Crepis paludosa), Sanicle (Sanicula europaea), Herb-Robert (Geranium robertianum), Bugle (Ajuga reptans), Horsetails (Equisetum spp.), Meadowsweet (Filipendula ulmaria) and some sedges (Carex spp.). Areas of marsh are found in the wetter areas by the stream, particularly at the western end of the site.

There is an area of broad-leaved woodland on the steeper southern slopes of the glen. Common species occurring here are Ash and Sycamore (Acer pseudoplatanus), with Brambles (Rubus fruticosus agg.) colonizing the more open areas.

An area of land that slopes towards the fen has been used as a landfill site for domestic refuse. The site is also used a clay pigeon shoot and shattered clay pigeons are scattered throughout the area. Fens are rare in Wicklow/Dublin and this is one of only two sites in Wicklow for the Narrow-leaved Marsh-orchid. The fen vegetation is well developed, with an unusually large number of sedge species present. The presence of alkaline fen and of petrifying spring/seepage areas on the site is particularly notable, as these habitats are listed, the latter with priority status, on Annex I of the EU Habitats Directive.

30.10.2002

Bray Head (000714)

SITE NAME: Bray Head

SITE CODE: 000714

This coastal site is situated in the north-east of Co. Wicklow between the towns of Bray and Greystones. Bedrock geology is Cambrian quartzites and shales (with mudstones and greywackes). Bray Head consists of a plateau of high ground, with five prominent quartzite knolls and has a maximum height of 241 m. The more exposed higher ground has a covering of shallow acidic soils, with protruding bedrock and scree. Elsewhere, deeper soils are formed by drift deposits, calcareous in character.

Heath, a habitat listed on Annex I of the EU Habitats Directive, is the principal habitat over much of the Head. The vegetation of the upper plateau area is dominated by dwarf shrubs, mainly Ling (Calluna vulgaris), Bell Heather (Erica cinerea) and Gorse (Ulex europaeus and U. gallii). Broom (Cytisus scoparius) also occurs and associated with the gorse and broom is the Red Data Book species Greater Broomrape (Orobanche rapum-genistae). In the areas where the shrubs are less dense Tormentil (Potentilla erecta), Milkwort (Polygala vulgaris), Heath Bedstraw (Galium saxatile) and a variety of grasses (e.g. Aira praecox, Agrostis tenuis, Deschampsia flexuosa) are present. Where rock outcrops occur species such as English Stonecrop (Sedum anglicum) and Sheep's-bit Scabious (Jasione montana) are found. Bracken (Pteridium aquifolium) is dominant in some areas.

The heath communities which occur on the dry slopes above the sea-cliffs, especially those south-facing, are more open in character and dominated by grasses rather than dwarf shrubs. The annual plant communities which develop here are very typical of those found only on sites in south-eastern Ireland. Common species include Wood Sage (Teucrium scordonia), clovers (Trifolium dubium, T. campestre), Scarlet Pimpernal (Anagallis arvensis) and Field Madder (Sherardia arvensis). An uncommon annual species which can appear abundantly in the heath after a fire event is Yellow Fumitory (Corydalis claviculata). Some rare plants are found in this habitat, notably Bird's-foot (Ornithopus perpusillus) and Spring Vetch (Vicia lathyroides), both Red Data Book species.

Calcareous dry grassland, typically species-rich, occurs on deposits of glacial till. The primary grass species are Quaking Grass (Briza media), Smooth Meadow-grass (Poa pratensis) and Red Fescue (Festuca rubra). Typical calcicole herbs include Pale Flax (Linum bienne), Salad Burnet (Sangusiorba minor), Burnet-saxifrage (Pimpinella saxifrage), Carline Thistle (Carlina vulgaris) and Kidney Vetch (Anthyllis vulneraria). Orchids are a feature of this habitat, with five species known from the area - Pyramidal Orchid (Anacamptis pyramidalis), Common Spotted Orchid (Dactylorhiza fuchsii), Common Twayblade (Listera ovata), Fragrant Orchid (Gymnadenia conopsea) and Bee Orchid (Ophrys apifera). Bloody Crane's-bill (Geranium sanguineum) was refound recently in this community at Bray Head - this is a typical species of the Burren and is very rare in eastern Ireland.

Rocky sea cliffs, another Annex I habitat, form most of the seaward boundary at this site and extend for approximately 2 km. Steep clay cliffs extend southwards for a further 1 km, with a small area of clay cliff also at the northernmost part of site. The rocky cliffs are divided by a railway track built in the 1800s. The lower cliffs are fairly steep in places but above the track they are less steep and often support heath or dry grassland vegetation. In parts the cliffs are up to 60 m in height. Typical species of the more exposed rock areas are Common Scurvy-grass (Cochlearia officinalis), Rock Spurrey (Spergularia rupicola), Thrift (Armeria maritima), Sea Campion (Silene maritima), and Sea Samphire (Crithmum maritimum). On some sections of the cliff face, the locally scarce Tree Mallow (Lavatera arborea) is found. Species of the upper cliff flora include Kidney Vetch (Anthyllis vulneraria) and Red Fescue. A widespread species found from the mid to upper zones of the cliff face is Ivy (Hedera helix). Associated with the Ivy is the scarce Rubia peregrina. The clay cliffs in the southern part of the site are steep and unstable and have little vegetation.

A stand of mostly native woodland occurs in the northern part of the site. This is a fairly pure Sessile Oak (Quercus petraea) dominated woodland, with some Ash (Fraxinus excelsior) and Birch (Betula pubescens). Understorey trees which occur are Holly (Ilex aquifolium) and Hawthorn (Crataegus monogyna). The wood is on shallow drift and the ground flora often has species more associated with heath than woodlands. Other habitats which are found at this site include bedrock shore, a sandy/shingle beach and an area of shallow marine water.

Bray Head has an important seabird colony. A census in 1999 gave the following populations: Fulmar (55 pairs), Shag (8 pairs), Kittiwake (781+ pairs), Guillemots (286 individuals), Razorbills (191 individuals) and Black Guillemots (123 individuals). A few pairs of gulls also breed. Both the Kittiwake and Black Guillemot populations are of national importance.

Peregrine Falcon, an Annex I species of the EU Birds Directive, breeds, as well as Raven and Kestrel. Characteristic bird species of the heath areas are Stonechat, Whitethroat, Linnet and Skylark.

The heath and grassland habitats at this site are threatened by reclamation for agriculture and also by frequent burning. The site is a popular recreational area and is especially used by walkers.

Bray Head is of high conservation importance as it has good examples of two habitats (sea cliffs and dry heath) listed on Annex I of the EU Habitats Directive. It also supports a number of rare plant species and has ornithological importance.

22.10.1999

Carriggower Bog (000716)

SITE NAME: Carriggower Bog

SITE CODE: 000716

Carriggower Bog is situated on Calary plateau at the eastern edge of the Wicklow Mountains,. The site is an area of wet bog and poor fen, flanked by the Vartry River on the south-western side.

This site is a candidate SAC selected for transition mire, a habitat listed on Annex I of the EU Habitats Directive.

The bog was exploited for peat extraction until 100 years ago and the peat cuttings are now flooded. The remaining bog vegetation is characterised by bog moss hummocks. Several species of Sphagnum are found including Sphagnum recurvum. On top of the hummocks Heather (Calluna vulgaris) and Cross-leaved Heath (Erica tetralix) are dominant. Between the hummocks, in the wet areas, Bog Asphodel (Narthecium ossifragum), Bogbean (Menyanthes trifoliata) and Common Cottongrass (Eriophorum angustifolium) are common, while Purple Moor-grass (Molinia caerulea) is locally abundant.

Birch (Betula pubescens) and Willow (Salix spp.) dominate an area of scrub at the centre of the site.

Very wet areas of transition mire occur on the south-western side of the site. The whole area is quaking and is characterised by a mosaic of sedges, grasses and rushes. Bottle Sedge (Carex rostrata) is the most abundant sedge, but others include White Sedge (Carex curta), Star Sedge (Carex echinata) and Carnation Sedge (Carex panicea). Purple Moor-grass and Sharp-flowered Rush (Juncus acutiflorus) are also present.

Towards the northern side of the site there are rock outcrops of quartzite which form low knolls. This area is partly covered by heath vegetation, dominated by Gorse (Ulex europaeus), Bell Heather (Erica cinerea) and Heather, all of which are growing over a grassy sward grazed by sheep. The main grasses are Sweet Vernal-grass (Anthoxanthum odoratum), Yorkshire-fog (Holcus lanatus), Creeping Soft-grass (Holcus mollis) and Bent Grass (Agrostis spp.)

The mosaic of transition bog habitats supports a wide range of poor fen/bogland invertebrates, including a suite of wetland species of international importance (most of the Order Diptera).

Carriggower Bog is a notable site for wintering Snipe (117 - mean winter count 1996/97 to 2000/01) and Jack Snipe (16 - mean winter count 1996/97 to 2000/01). These numbers are probably of national importance and the site has consistently held the highest national count for Jack Snipe in recent years. The very wet bog is prime habitat for both these species.

This site is of conservation importance because it shows a good transition between fen and bog vegetation (with the fen being rapidly colonised by characteristic bog species). The area holds a rich and varied flora and it provides a habitat for some rare invertebrates; Carrigower Bog is the last remaining site in Wicklow from which some of these remaining invertebrates are recorded.

18.06.2003

Glen of the Downs (000719)

SITE NAME: Glen of the Downs

SITE CODE: 000719

This site is a semi-natural Oak wood situated within an impressive glacial overflow channel. It is located on the Dublin-Wexford road about 7 km south of Bray, Co. Wicklow. The underlying rock is mostly quartzite and it outcrops in a few places. The soil is a sandy loam, Brown Earth to Brown Podzolic, and is very dry over much of the site. Most of the site has been a Nature Reserve since 1980.

Much of the site comprises Sessile Oak (Quercus petraea) woodland referable to the Blechno-Quercetum petraeae association. Sessile Oak is especially dominant on the mid to upper slopes. The quality of the Oak-dominated areas is variable - the association is well developed and especially pure on the western side, while in some places it occurs as coppice scrub. The shrub layer is sparse but Holly (Ilex aquilinum) is locally common. On the ground, Great Wood-rush (Luzula sylvatica) forms a dense carpet over much of the area, with other species such as Bilberry (Vaccinium myrtillus), Heather (Calluna vulgaris) and Wood Sage (Teucrium scorodonia) occurring occasionally. Brambles (Rubus fruticosus agg.) and ferns such as Soft Shield-fern (Polystichum setiferum) are abundant in places, especially on the south-western slopes.

The site includes some areas of mixed woodland, in which Beech (Fagus sylvatica), Sycamore (Acer pseudoplatanus), Scot's Pine (Pinus sylvestris) and other exotics occur. Bryophytes are notably scarce within the valley and may reflect the dryness of the site, however, some rare species have been recorded.

A narrow band of alluvium associated with a small stream occurs on the valley floor. There, the woodland is dominated by Ash (Fraxinus excelsior) and Hazel (Corylus avellana), with a species-rich herb layer that includes Ramsons (Allium ursinum), Dog Violet (Viola riviniana) and Bluebells (Hyacinthoides non-scripta).

A breeding bird census carried out in 1990 recorded a total of 21 species holding territory. Wren, Robin, Blue Tit, Chaffinch and Great Tit were the most abundant species. Blackcap and Jay also breed, and the rare Wood Warbler has been recorded. Grey Wagtail breeds along the stream.

The site is notable for the presence of the rare bryophytes, Cephaloziella turneri, Pterigynandrum filiforme and Plagiothecium curvifolium, the last named in its only Irish site, as well as for several rare or scarce Myxomycete fungi, namely Echinostelium colliculosum, Licea marginata, L. perexigua, Perichaena vermicularis, Comatricha ellae (only known Irish site), Diderma chondrioderma and Didymium crustaceum.

Glen of the Downs is also notable for some rare invertebrates, including Mycetobia obscura (Diptera) which is found in only one other locality in Britain and Ireland. The glacial overflow channel is the largest example of such a feature in the country.

Although exploited heavily in the past, this woodland is well developed, rich in species and one of high conservation significance. The site supports Oak woodland of a type that is listed on Annex II of the EU Habitats Directive.

1.2.1999

Knocksink Wood (000725)

SITE NAME: Knocksink Wood

SITE CODE: 000725

Knocksink Wood is situated in the valley of the Glencullen River north-west of Enniskerry. The fast-flowing Glencullen River winds its way over granite boulders along the valley floor. The steep sides of the valley are mostly covered with calcareous drift.

Some of the slopes are dominated by Sessile Oak (Quercus petraea) with a sparse shrub layer of Holly (Ilex aquilinum) and Hazel (Corylus avellana), while on the ground there is a carpet of Great Wood-rush (Luzula sylvatica). Other areas are characterised by mixed woodland, with Oak, Ash (Fraxinus excelsior), Beech (Fagus sylvatica), Sycamore (Acer pseudoplatanus) and the occasional conifer occurring. The ground flora includes Ivy (Hedera helix) and Brambles (Rubus fruticosus agg.), and often luxuriant ferns, such as Hart's Tongue (Phyllitis scolopendrium), Soft Shield-fern (Polystichium setiferum), and mosses. Lichens occur abundantly on some trees.

A notable feature of the slopes are the frequent and extensive springs and seepage areas within the woodland. These petrifying springs are listed as a priority habitat on Annex I of the EU Habitats Directive. Associated with the springs and the river are stands of wet alluvial forest, also a habitat listed with priority status on Annex I of the EU Habitats Directive. The wet woodland is dominated by Ash and Alder (Alnus spp.) and is assigned to the group Carici remotae-Fraxinetum. Other species which occur include Willow (Salix spp.), Birch (Betula pubescens) and Hazel. Islands in the river and open gravelly areas provide further habitat diversity.

A number of scarce or rare plants occur within the site including Blue Fleabane (Erigeron acer), Ivy-leaved Bellflower (Wahlenbergia hederacea) and Yellow Archangel (Lamiastrum galeobdolon).

This site has one of the most diverse woodland invertebrate faunas in Ireland, incorporating wet woodland organisms threatened internationally within the EU. Vertebrates noted in the vicinity, either by tracks, sett or sight, include Red Squirrel, Badger, Rabbit and Deer. The woodland supports large populations of birds, including many common passerines (Robin, Blackbird, Song Thrush, Wren, Chaffinch) and crows, such as Rook, Hooded Crow, Magpie, Jackdaw and Raven. A Buzzard has been noted in the area and Dipper are occasionally seen in the river.

The importance of this site lies in the diversity of woodland habitats which occur. The presence of rare or threatened plants and invertebrates adds to the interest. Much of this site has been designated a Statutory Nature Reserve and there is presently an educational centre within the site.

7.8.2003

Wicklow Mountains (002122)

SITE NAME: Wicklow Mountains

SITE CODE: 002122

This site is a complex of upland areas in Counties Wicklow and Dublin, flanked by Blessington Reservoir to the west and Vartry Reservoir in the east, Cruagh Mt. in the north and Lybagh Mt. in the south. Most of the site is over 300m, with much ground over 600m and the highest peak of Lugnaquilla at 925m.

The Wicklow Uplands comprise a core of granites flanked by Ordovician schists, mudstones and volcanics. The form of the Wicklow Glens is due to glacial erosion.

The Wicklow Mountains are drained by several major rivers including the Dargle, Liffey, Dodder, Slaney and Avonmore. The river water in the mountain areas is often peaty, especially during floods.

The topography is typical of a mountain chain, showing the effects of more than one cycle of erosion. The massive granite has weathered characteristically into broad domes. Most of the western part of the site consists of an elevated moorland, covered by peat. The surrounding schists have assumed more diverse outlines, forming prominent peaks and rocky foothills with deep glens. The dominant topographical features are the products of glaciation. High corrie lakes, deep valleys and moraines are common features of this area.

The substrate over much of the area is peat, usually less than 2m deep. Poor mineral soil covers the slopes and rock outcrops are frequent

The vegetation over most of the site is a mosaic of heath, blanket bog and upland grassland (mostly on peaty soil, though some on mineral soil), with stands of dense Bracken (Pteridium aquilinum) and small woodlands mainly along the rivers. Mountain loughs and corrie lakes are scattered throughout the site. The site supports many habitats that are listed on Annex I of the E.U. Habitats Directive.

The two dominant vegetation communities in the area are heath and blanket bog. Heath vegetation, with both wet and dry heath well represented, occurs in association with blanket bog, upland acid grassland and rocky habitats. The wet heath is characterised by species such as Ling (Calluna vulgaris), Cross-leaved Heath (Erica tetralix), Cottongrasses (Eriophorum spp.), Tormentil (Potentilla erecta), Mat-grass (Nardus stricta), Bent grasses (Agrostis spp.) and bog mosses (Sphagnum spp.). In places the wet heath occurs in conjunction with flush communities and streamside vegetation, and here species such as Heath Rush (Juncus squarrosus) and Carex spp. are found. Dry heath at this site is confined to shallow peaty soils on steep slopes where drainage is better and particularly in sheltered conditions. It is characterised by species such as Ling, Gorse (Ulex spp.), Bell Heather (Erica cinerea), Bilberry (Vaccinium myrtillus), Purple Moor-grass (Molinia caerulea) and lichens (Cladonia spp.). In places the heath grades into upland grassland on mineral soil, some examples of which correspond to the E.U. Habitats Directive Annex I priority habitat species-rich Nardus grassland.

Blanket bog is usually dominated by Cottongrasses, Ling and bog mosses (Sphagnum spp.). On steeper slopes there is some flushing and here Purple Moor-grass, Heath Rush, and certain Sphagnum species become more common. The Liffey Head blanket bog is among the best of its kind in eastern Ireland, with deep peat formations and an extensive system of dystrophic pools developed among the hummocks and hollows on the bog surface. The vegetation is largely dominated by Ling and Cross-leaved Heath, with Cottongrasses (Eriophorum vaginatum and E. angustifolium), Deergrass (Scirpus cespitosus) and Bog Asphodel (Narthecium ossifragum). In drier areas, Bilberry and Cowberry (Vaccinium vitis-idaea) are common, while the scarce Bog Rosemary (Andromeda polifolia) is also found. Blanket bog occurs over extensive areas of deeper peat on the plateau and also on gentle slopes at high altitudes. Peat erosion is frequent on the peaks - this may be a natural process, but is likely to be accelerated by activities such as grazing.

Due to the underlying rock strata, the water of the rivers and streams tends towards acidity. The water is generally oligotrophic and free from enrichment. The lakes within the area range from the high altitude lakes of Lough Firrib and Three Lakes, to the lower pater-noster lakes of Glendalough, Lough Tay and Lough Dan. Spectacular corrie lakes (such as Loughs Bray (Upper and Lower), Ouler, Cleevaun, Arts, Kellys and Nahanagan) exhibit fine sequences of moraine stages. The deep lakes are characteristically species poor, but hold some interesting plants including an unusual form of Quillwort (Isoetes lacustris var. morei), a Stonewort (Nitella sp.) and Floating Bur-reed (Sparganium angustifolium). The Red Data Book fish species Arctic Char has been recorded from Lough Dan, but this population may now have died out.

Alpine vegetation occurs on some of the mountain tops, notably in the Lugnaquilla area, and also on

exposed cliffs and scree slopes elsewhere in the site. Here alpine heath vegetation is represented with species such as Crowberry (Empetrum nigrum), Cowberry, Dwarf Willow (Salix herbacea), the grey-green moss Racomitrium lanuginosum and scarce species such as Mountain Clubmoss (Diphasiastrum alpinum), Firmoss (Huperzia selago), and Starry Saxifrage (Saxifraga stellaris). Some rare arctic-alpine species have been recorded, including Alpine Lady's-mantle (Alchemilla alpina) and Alpine Saw-wort (Saussurea alpina).

Small areas of old oakwood (Blechno-Quercetum petraeae type) occur on the slopes of Glendalough and Glenmalure, near L. Tay and L. Dan, with native Sessile Oak (Quercus petraea) 100-120 years old. On wetter areas, wet broadleaved semi-natural woodlands occur, which are dominated by Downy Birch (Betula pubescens). Mixed woodland with non-native tree species also occurs.

The site supports a range of rare plant species, which are listed in the Irish Red Data Book: Parsley Fern (Cryptogramma crispa), Marsh Clubmoss (Lycopodiella inundata), Greater Broom-rape (Orobanche rapum-genistae), Alpine Lady's-mantle, Alpine Saw-wort, Lanceolate Spleenwort (Asplenium billotii), Small White Orchid (Pseudorchis albida) and Bog Orchid (Hammarbya paludosa). The latter three species are legally protected under the Flora (Protection) Order, 1999. The rare Myxomycete fungus, Echinostelium colliculosum, has been recorded from the Military Road.

Mammals and birds which occur are typical of the uplands. Deer are abundant, mainly hybrids between Red and Sika Deer. Other mammals include Hare, Badger and Otter, the latter being a species listed on Annex II of the E.U. Habitats Directive. Pine Marten has recently been confirmed as occurring within the site. Among the birds, Meadow Pipit, Skylark, Raven and Red Grouse are resident throughout the site. Wheatear, Whinchat and the scarce Ring Ouzel are summer visitors. Wood Warbler and Redstarts are rare breeding species of the woodlands. Dipper and Grey Wagtail are typical riparian species. Merlin and Peregrine Falcon, both Annex I species of the EU Birds Directive, breed within the site. Recently, Goosander has become established as a breeding species.

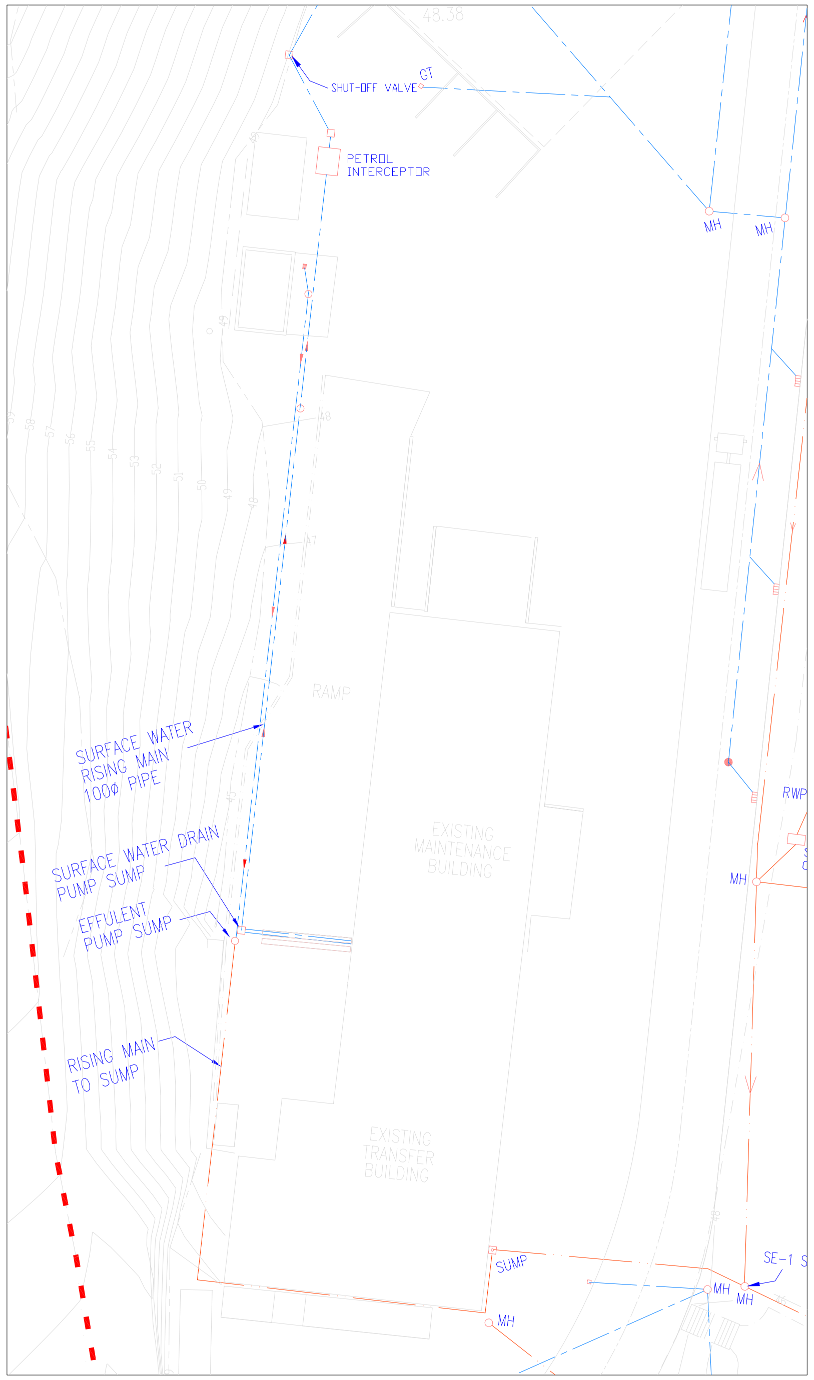
Large areas of the site are owned by NPWS, and managed for nature conservation based on traditional landuses for the uplands. The most common landuse is traditional sheep grazing. Other land uses include turf-cutting, mostly hand-cutting but some machine-cutting occurs. These activities are largely confined to the Military Road, where there is easy access. Large areas which had been previously hand-cut and are now abandoned, are regenerating. In the last 40 years, forestry has become an important landuse in the uplands, and has affected both the wildlife and the hydrology of the area. Amenity use is very high, with Dublin city close to the site.

Wicklow Mountains is important as a complex, extensive upland site. It shows great diversity from a geomorphological and a topographical point of view. The vegetation provides examples of the typical upland habitats with heath, blanket bog and upland grassland covering large, relatively undisturbed areas. In all ten habitats listed on Annex I of the EU Habitats Directive are found within the site. Several rare, protected plant and animal species occur.

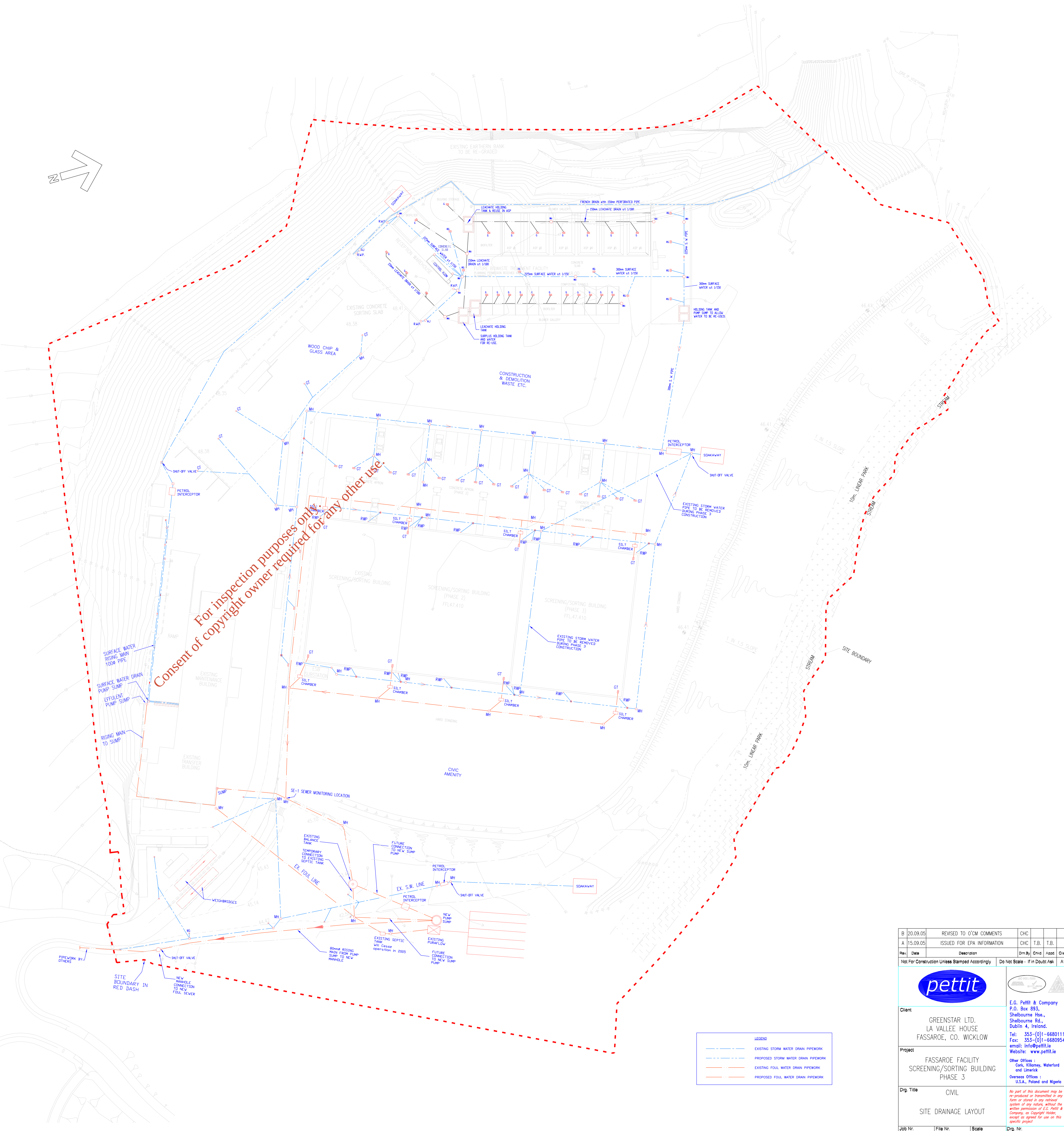
12.10.2001

APPENDIX 3

Drawing No. B9338-C002-B



EXISTING DRAINAGE AT QUARANTINE AREA/TRUCK WASH AREA/COMPACTOR AREA
SCALE 1:250



LEGEND

EXISTING STORM WATER DRAIN PIPEWORK
PROPOSED STORM WATER DRAIN PIPEWORK
EXISTING FOUL WATER DRAIN PIPEWORK
PROPOSED FOUL WATER DRAIN PIPEWORK

Rev.	Date	Description	Drn.By	Chkd.	Appd.	Client
B	20.09.05	REVISED TO O'CM COMMENTS	CHC			
A	15.09.05	ISSUED FOR EPA INFORMATION	CHC	T.B.	T.B.	

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PHASE 3

Drg. Title
CIVIL
SITE DRAINAGE LAYOUT

Job Nr.	File Nr.	Scale	Drg. Nr.
B9338	9338C002	1:500	B9338-C002-B

APPENDIX 4

Tables E.3(i) and E.3(ii) of the WLA

TABLE E.3(i): EMISSIONS TO SEWER (One page for each emission)

Emission Point:

Emission Point Ref. Nº:	SE-1
Location of connection to sewer :	At Site Entrance
Grid Ref. (10 digit, 5E,5N):	E324315.40 N218079.10
Name of sewage undertaker:	Wicklow County Council

Emission Details:

(i) Volume to be emitted			
Normal/day	$18m^3$	Maximum/day	$23m^3$
Maximum rate/hour	$0.8m^3$		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	30 min/hr 2 hr/day 365 day/yr

TABLE E.3(ii): EMISSIONS TO SEWER - Characteristics of the emission (1 table per emission point)

Emission point reference number : _____

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
Temperature						42c			
BOD						3,500	130		
COD						7,000	400		
pH						5-10			
Ammoniacal Nitrogen						100	2		
Suspended Solids						2000	30		
Sulphates (as SO_4)						1000	20		
Detergents (as MBAS)						100	2		
Fats, Oils, Grease						100	2		