ABERPORTH AIRFIELD PHASE 2

Ceredigion

Archaeological Assessment Report

Oxford Archaeology North

July 2004

White Young Green Environmental Ltd

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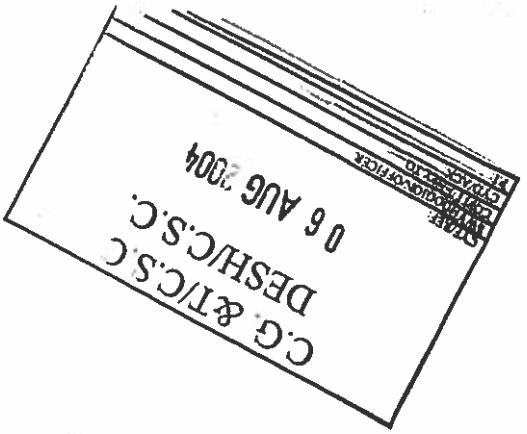

Supplementary Environmental Report

Diversion of the B4333 at Aberporth Airfield

for

Ceredigion County Council

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CEREDIGION COUNTY COUNCIL

DIVERSION OF THE B4333 AT ABERPORTH AIRFIELD

SUPPLEMENTARY ENVIRONMENTAL REPORT

AUGUST 2004

CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 Background

The Defence Estates and Research Establishment (Dera) is proposing to develop Aberporth airfield (Figure E4734/01 in Appendix B) in Ceredigion. The development will involve the construction of premises for commercial and industrial use and conversion of the existing military runway into a civilian airfield. Planning applications for Phase I and II of the development have received planning approval from Ceredigion County Council (CCC) the planning authority for Aberporth.

The B4333 road from Blaenannerch to Aberporth (Figure E4734/01 in Appendix B) runs adjacent to the western boundary of the airfield. Incorporated into Phase II of the development is an extension of the main runway by approximately 280m to the west. This extension will enable the airfield to be used by civilian aeroplanes. To provide a sufficient safety zone for these aeroplanes and to improve the highway infrastructure a diversion of the B4333 road by the highway authority (CCC) is required.

The diversion of the B4333 road is being taken forward by Ceredigion County Council (CCC) Highways Property and Works Department. CCC commissioned White Young Green Environmental (WYGE) to undertake an informal environmental assessment process for the current alignment of the road diversion. This Supplementary Environmental Report presents the results of the informal environmental assessment process for the following planning application:

Project Title: Diversion of the B4333 at Aberporth Airfield
Applicant: Ceredigion County Council Highways Property and Works Department

This Supplementary Environmental Report is a non-statutory document provided to CCC as supporting information for the planning application. It supplements and should be read in conjunction with the original Environmental Statement (ES) (WYGE, 2000) which accompanied the planning application for Phase II of the development including the original diversion route of the B4333 road.

The conditions which apply to this Supplementary Environmental Report are contained in Appendix A.

1.2 Site Location and Context

The development site at Aberporth airfield in Ceredigion is located approximately 6km north east of the town of Cardigan and immediately to the north of the village of Blaenannerch at National Grid Reference (NGR) SN 246 492. The location of the site is shown on Figure E4734/01 in Appendix B. It is surrounded by agricultural land except for the western boundary which runs adjacent to the existing B4333 road.

The current alignment of the B4333 road runs from the A487 trunk road in Blaenannerch village northwards to Aberporth. Blaenannerch village comprises three clusters of development with over 65 dwellings along a half mile stretch of the A487 trunk road. The existing junction of the B4333 road and the A487 trunk road currently forms a left-handed staggered junction with a minor road serving a small residential area to the south of the A487 trunk road. This junction does not conform to current highway design standards.

The single carriageway B4333 road is about 5.5m wide and is subject to the national speed limit of 60mph. The A487 trunk road is about 7.5m in width with intermittent lengths of footway and numerous residential accesses off it. The B4333 road is maintained by CCC Highways Property and Works Department whilst the A487 trunk road is maintained by the Transportation Directorate of the Welsh Assembly Government.

The development site application boundary is shown on Drawing A017904/PA/05 in Appendix E.

1.3 Environmental Assessment Process

The Environmental Impact Assessment (Town and County Planning) Regulations 1999 (SI 293) implement the EC Directive 85/337/EEC on the Assessment of the Effects of Certain Public and Private Projects on the Environment as amended by the EC Directive 97/11/EC. Under SI 293 an Environmental Statement (ES) must be prepared for works that are likely to give rise to significant environmental effects.

CCC has determined that a statutory Environmental Impact Assessment (EIA) resulting in the production of an ES does not need to accompany the planning application for the road diversion. However the design/alignment of the road diversion had developed since submission of the planning application for Phase II of the development in November 2000 and for this reason they requested that an informal environmental assessment process be undertaken to take account of the design/alignment changes.

The informal environmental assessment process undertaken for the road diversion involved the following steps:

- Identifying features of the existing environment likely to be affected by development.
- Identifying the environmental impacts of the development.
- Identifying mitigation and enhancement measures.
- Identifying residual (after implementation of mitigation) significant environmental effects.

No consultation has been undertaken for the purposes of this assessment.

The significance of environmental effects is determined according to the magnitude of impact and the sensitivity of the receptor upon which the impact occurs. The magnitude (scale of change) of an impact is determined by considering the predicted deviation from baseline conditions and the extent of the impact. Sensitivity or the importance of a receptor is determined in terms of geographical extent and/or the importance of a receptor based on statutory designations. The interaction of magnitude and sensitivity as shown in Table 1.1 allows significance to be determined.

Table 1.1 Significance Matrix

Importance of Receptor	Magnitude of Impact			
	Substantial	Moderate	Slight	Negligible
International or National	Major	Major - Moderate	Moderate-Minor	Negligible
Regional or County	Major - Moderate	Moderate - Minor	Minor	Negligible
Local or Borough	Moderate - Minor	Minor	Minor – Negligible	Negligible

1.4 Report Format

Impacts in relation to the following topics have been reviewed within this Supplementary Environmental Report as requested by CCC:

- Ecology and nature conservation.
- Landscape and visual effects.
- Water environment.
- Noise.
- Air quality.
- Archaeology and cultural heritage.

Impacts arising from the road diversion in relation to other topics were considered by CCC to remain as in the original ES (WYGE, 2000) which accompanied the planning application for Phase II of the development including the original diversion route of the B4333 road.

The format of the report is as follows: -

Section 1: Introduction.
Section 2: Development Description.
Section 3: Environmental Assessment.
Section 4: Conclusion.

Each environmental topic is reported in the same format for ease of comparison:

- Introduction.
- Baseline environment.
- Construction impacts.
- Operational impacts.
- Mitigation measures.
- Summary of residual environmental effects.

2.0 DEVELOPMENT DESCRIPTION

2.1 Phase I and II Development Proposals

The Aberporth airfield is owned by the Ministry of Defence (MoD) and operated by Dera. It dates back to 1940 and the Second World War when it was opened as an anti aircraft co-operation base. Following the war the airfield was retained and in 1956 the main runway was constructed. The site currently comprises MoD apprentice training and accommodation facilities plus hangars and ancillary offices.

Planning applications for Phase I and II (Figure E3484/01 in Appendix B) of the development were submitted to CCC in 2000/2002 and have received planning approval. The ES (WYGE, 2000) which was produced for Phase II of the development was updated in the form of an addendum (WYGE, 2002) for the Phase I development. The main features of each phase are as follows:

Phase I, 7.3ha

- Demolition of existing Dera buildings.
- Construction of new Dera buildings.
- Construction of an apprentice training centre.
- Construction of a roundabout at the main site entrance on the B4333 road.
- Construction of new Welsh Development Agency office venture buildings.
- Construction of tennis courts to the east of the B4333 road.

Phase 2, 18.3ha

- Construction of manufacturing and office facilities.
- Creation of a new Combined Heat & Power (CHP) facility.
- Creation of a science park.
- Construction of an aircraft park and hangar buildings.
- Construction of individual office units.
- Construction of a control tower and associated masts/aerials.

2.2 Requirement for Diversion

Phase II of the development also incorporates an extension of the 52.5m wide main runway by approximately 280m to the west. The runway will be extended from a length of 915m to a length of 1199m. In addition to this a 60m stop way distance and a 30m safety zone are required. To provide a sufficient safety zone for the runway and space for approach lighting and landscaping works a diversion of the B4333 road is required. Funding for the road will be sourced from European Objective 1 Structure Funds which provides funding for economic regeneration in areas of economic downturn.

2.3 Diversion of the B4333 Road

The current diversion route for the B4333 road runs from the new roundabout being constructed at NGR SN 245 494 (as part of Phase I of the development) to the A487 trunk road at NGR SN 240 490 where a new three-armed roundabout will be constructed. The diversion route runs up to 400m to the west of the existing road alignment. However this current alignment in only 75m west of the alignment approved within the original Phase II planning application. The development site application boundary is shown on Drawing A017904/PA/05 in Appendix E.

The new road will be a 7.3m wide single carriageway with a 2.7m wide segregated cyclepath/footpath running down the western side. On either side of the road dry swale (drainage) ditches will be constructed separated from the road by a verge. The route will be bounded by highway specification wooden post and rail fence. Lighting will be provided on the roundabout with the A347 trunk road and this will be designed to minimize light pollution. The road itself will not be illuminated. The existing B4333 road will remain in-situ (to provide access to the airfield) but will no longer form a through route.

The following accesses will be provided along the route:

- Gated field access at NGR SN 244 494.
- Gated farm access linking with the existing B4333 road at NGR SN 244 494.
- Gated access to the sewage treatment works at NGR SN 243 493 linking to the existing access route. The existing section of access road to the east of the new B4333 road will become disused.
- Cyttir-mawr gated single track road with passing place at NGR SN 240 491. This will link into the existing access road off the A487 trunk road. The southern half of the existing road will become disused and footpath 73/50 which runs along it will be diverted along the new access road. Stonewalls will be constructed at the entrance way to the Cyttir-mawr access road.

The layout of the road diversion is shown in Drawing A007978/740 in Appendix E.

In order to construct the road a working corridor of up to 25m within the development site application boundary shown on Drawing A017904/PA/05 in Appendix E will be required.

2.4 Construction Programme

Construction of the road diversion is anticipated to commence early 2005 and will last for a period of approximately 28 weeks.

2.5 Alternative Options and Alignments

The Ceredigion Unitary Development Plan (UDP) identifies Aberporth airfield as a Key Strategic Employment Site and allocates it for a range of B1, B2 and B8 uses and as a rural airport. The UDP notes that improvements to the highways infrastructure will be expected as part of airfield development including amendments to the existing access off the A487 trunk road to accommodate proposals for an upgraded runway and new entrances. The do nothing option would not permit the extension of the main runway and thus restrict use of the airfield by civilian aeroplanes. The majority of the diversion route is fixed by the need to comply with highway design standards. In addition to the proposed alignment two other alignments were considered. These alignments ran to the north and south of the preferred route by approximately 75m. The preferred route has been selected to provide a sufficient safety zone for the runway and space for approach lighting and landscaping works.

3.0 ECOLOGY AND NATURE CONSERVATION

3.1 Introduction

3.1.1 Ecological Impact Assessment

This section addresses the ecological impacts of the diversion of the B4333 road. Evaluation of the importance of ecological receptors and the assessment of significance have been undertaken in accordance with draft Institute of Ecology & Environmental Management (IEEM) guidelines (2002).

The IEEM guidelines use a different scale for magnitude and sensitivity to that presented in Table 1.1. The IEEM scale is utilised in this assessment, but to allow ecological impacts to be compared with the other impacts presented in this report, the equivalent level of magnitude or sensitivity on the scale presented in Table 1.1 is provided in brackets.

3.1.2 Ecological Desk Study

Preparation of the Phase II Environmental Statement (WYGE, 2000) involved an ecological desk study during which existing biological data for the site was collated. The desk study was re-examined as part of the addendum to the original ES (covering Phase I of the development) and was considered to still be applicable at that time.

The desk study included the full extent of the current diversion route. Due to the relatively short space of time between preparation of the 2002 addendum and this report and because previously there was a general lack of ecological data for the site it was not considered necessary to repeat the desk study for this assessment. The original desk study results are therefore presented in this report.

3.1.3 Ecological Field Survey

The ecological field survey was carried out on the 24 June 2004.

The diversion route plus a corridor of at least 250m either side of the route (where access was possible) was surveyed. The full extent of the survey area was in practice somewhat greater than this being determined using easily defined features on the ground using an OS 1:25000 plan. The northern and southern boundaries of the survey area were the footpath leading from Maes-y-coed to Rhosygadair Fawr and the A487 trunk road. The eastern boundary was the existing B4333 road and the western boundary followed the stream west of Rhosygadair Fawr leading down to Cyttir Mawr and then the access track from Cyttir Mawr to the A487 trunk road. The extent of the survey area is shown in Figure E4734/02 in Appendix B.

Phase 1 Habitat Survey

Habitats observed within the survey area were identified and mapped using the standard Phase I methodology (JNCC, 2003) with target notes made to describe any valuable or interesting features identified. A plan has been produced to illustrate the results (Figure E4734/02 in Appendix B) and this shows the various habitats present and the location of the target notes.

Hedgerow Surveys

Species rich hedgerow is defined in the Handbook for Phase 1 Habitat Survey (JNCC, 2003) as a hedge that has "a diversity of native woody species." However the number of species representing *a diversity* is not given and is therefore subjective. During the survey hedges with a total of four or more woody species throughout the whole length were considered as species rich. This number is the lowest number of species a hedge must support in order to be considered for classification as *important* under the Hedgerow Regulations 1997 (the 1997 Regulations). Several supporting features listed under Paragraph 4 of the 1997 Regulations would also need to be present for the hedge to be considered important with just four woody species.

Hedgerows within the survey area were surveyed and if four or more woody species (as listed in Schedule 3 of the 1997 Regulations) were observed alongside two or more of the features listed in Paragraph 4 of the Regulations the hedge was surveyed in more detail according to the methodology outlined in the Regulations.

The two hedges surveyed in detail were both over 200m in length and as such were divided into three sections. Both the woody species and herb layer of the central 30m of each section were surveyed. Features listed in Paragraph 4 of the 1997 Regulations applicable to the hedges in question were noted.

Controlled Species

The entire survey area was surveyed for controlled botanical species. These are listed in the Wildlife and Countryside Act 1981 (as amended) Schedule 9 Part 2 as giant hogweed *Heracleum mantegazzianum* and Japanese knotweed *Fallopia japonica*.

Protected Fauna

During the Phase 1 Habitat Survey the potential for the diversion route to support a range of legally protected faunal species was assessed. Surveys for many of the species/species groups listed below may only be carried out at certain times of year or may require repeated survey visits or may only be undertaken by licensed specialists. Therefore surveys for all of these groups were not undertaken at this time. However, where surveys could not be undertaken at this time the potential for the diversion route to support each species/species group was assessed based on the known range of each species/group and the suitability of the habitats in the survey area for that species/group.

Badger *Meles meles*: the entire survey area was comprehensively surveyed for badgers using the methodology outlined in Harris *et al.* (1989). Field signs such as setts, grubbed up grassland (caused by the animals digging for food), latrines, hairs and paw prints were searched for and recorded if found.

Water vole *Arvicola terrestris*: the survey aimed to identify the existence of any suitable habitat for water voles. This includes rivers, canals, ditches, lakes and large ponds with suitable habitat (earth banks with multi layered bankside vegetation of grasses and herbs). Such features were surveyed according the methodology outlined in Strachan (1998).

3.2 Baseline Environment

3.2.1 Designated Sites

The findings of the desk study carried out previously are as follows:

- There are no Sites of Special Scientific Interest (SSSI) within the survey area.
- The Aberporth Cliffs SSSI is located approximately 5km north of the survey area to the northwest of Aberporth.
- The marine habitat north of Aberporth is within the Cardigan Bay candidate Special Area of Conservation (cSAC).

3.2.2 Phase 1 Habitat Survey

The results of the Phase 1 Habitat Survey are illustrated in Figure E4734/02 in Appendix B. The vast majority of the survey area consists of improved, perennial rye grass *Lolium perenne*[1] dominated cattle and sheep pastures divided by hedgerows. Three large fields in the south east corner of the survey area have been combined and are currently in use as arable fields as is the field directly south of Rhosygadair Fawr.

[1] Nomenclature is taken from Dines, TD. Pearman, DA. Preston, CD. (2002).

There is a small area of ephemeral vegetation situated adjacent to the existing B4333 road (opposite Pen-y-Bryn) apparently as a result of some recent demolition work. This small fenced area contains a high percentage of bare ground with patches of bramble *Rubus fruticosus* agg, false oat-grass *Arrhenatherum elatius*, cock's foot *Dactylis glomerata*, creeping thistle *Cirsium arvense*, sow thistles *Sonchus* sp., selfheal *Prunella vulgaris* and fat-hen *Chenopodium album* agg. with some young silver birch *Betula pendula* and sycamore *Acer pseudoplatanus* growing along the fence.

Running across the survey area east-west from the existing B4333 road (north of the airfield) is a shallow drainage ditch. This ditch contains no water with the sides being poached by cattle and hence supports no associated aquatic, emergent or marginal vegetation.

A small stream runs from the north of Cyttir Mawr and borders the western edge of the arable field south of Rhosygadair Fawr. North of Cyttir Mawr the stream (Watercourse 1, Figure E4734/02) is bordered by a belt of trees consisting of pedunculate oak *Quercus robur*, sycamore and goat willow *Salix caprea* with an understorey of bramble, hazel *Corylus avellana*, blackthorn *Prunus spinosa* and occasional laburnum *Laburnum anagyroides*. The herb layer here is dominated by cock's foot and hedge bindweed *Calystegia sepium*. A mature thicket of Japanese knotweed *Fallopia japonica* was also observed in this area. The western bank of this stream as it flows alongside the arable field associated with Rhosygadir Fawr (Watercourse 2, Figure E4734/02) is lined by a more mature tree belt of sycamore, pedunculate oak and ash *Fraxinus excelsior* with an understorey of dog rose *Rosa canina*, brambles and hawthorn *Crataegus monogyna*. The herb layer is dominated by false oat-grass, cleavers *Galium aparine* and foxglove *Digitalis purpurea*.

3.2.3 Hedgerow Surveys

The majority of the hedgerows dividing the fields were not considered to be species rich as they contained less than four woody species. However two species rich hedgerows (Hedges 1 & 2, Figure E4734/02) supporting four or more woody species form the boundaries of the large arable field in the south east corner of the survey area. Both these hedges contain hawthorn, blackthorn, gorse *Ulex europaeus*, bramble and in the case of the hedge forming the north eastern boundary of this field (Hedge 2) laburnum. However none of the features listed in Paragraph 4 of the 1997 Regulations were associated with these hedges and they are therefore not likely to be considered *important*. The hedgerow dividing the field containing the sewage treatment works and the field directly east of Cyttir Mawr (Hedge 3) contained five woody species listed in Schedule 3 of the 1997 Regulations. However it did not contain the required four features listed in Paragraph 4 of the 1997 Regulations and is therefore also unlikely to be considered *important*.

The hedges that border the track leading from the A487 trunk road to Cyttir Mawr (Hedges 4 & 5) both contained five woody species listed in Schedule 3 of the 1997 Regulations along their entire length and as such both hedges were surveyed in detail to determine whether they should be classed as *important* under the 1997 Regulations. None of the surveyed sections of the western hedge (Hedge 4) contained more than three woody species and are therefore not considered likely to be protected under the 1997 Regulations. One section of the eastern hedge (Hedge 5) is adjacent to a Public Right of Way and four woody species listed on Schedule 3 of the 1997 Regulations were observed in the surveyed section. These are blackthorn, hawthorn, ash, and gooseberry *Ribes uva-crispa*. The features listed in Paragraph 4 of the 1997 Regulation applicable to this hedge are that the hedge has a bank along more than half its length and does not contain gaps which add up to more than 10%. Due to the hedge being adjacent to a footpath the parallel hedge (Hedge 4) within 15m is not taken into account. This hedge therefore meets the minimum requirement to be considered as *important* under the 1997 Regulations. This assessment should be taken as an indication that this hedge may be *important*. However, it is the responsibility of CCC to formally designate hedgerows as such.

Although not necessarily considered *important* under the 1997 Regulations many of the field boundaries within the survey area comprised mature hedgerows and mature tree belts likely to be of some nature conservation value. Several of these would be severed by the route of the B4333 road diversion.

3.2.4 Controlled species

One mature thicket of Japanese knotweed was observed within the survey area. This is situated to the north of Cyttir Mawr (NGR SN 23914 49206). The location of the stand of Japanese knotweed is shown in Figure E4734/02 in Appendix B.

3.2.5 Fauna

Invertebrates

A survey specifically aimed at identifying which invertebrates may be present was not carried out. However, it is not thought that the habitats present would support specialist groups of invertebrates or those limited to certain types of habitat (such as dead wood or ancient woodland).

Amphibians and Reptiles

No ponds or other water bodies suitable for amphibians were observed within 250m of the diversion route during the field survey in June 2004. The survey area is therefore not considered likely to be of value to amphibians. The habitats present within the survey area, predominantly intensively managed fields, are considered very unlikely to support reptiles.

Birds

The hedgerows provide ideal nesting/foraging habitat for a variety of common passerine species and song thrush *Turdus philomelos*, wren *Troglodytes troglodytes*, chaffinch *Fringilla coelebs* and house sparrow *Passer domesticus* were all observed during the survey work. The site is not considered likely to support any species afforded special protection through inclusion on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended). Barn owl *Tyto alba* may occur in the area and is known to be highly susceptible to collisions with vehicles. However the habitats within the survey area, particularly the closely grazed improved grassland, are considered unlikely to support a high density of small mammals (the main prey for barn owls) and are therefore considered unlikely to be used by foraging barn owls.

Mammals

Badger: A single badger sett consisting of one hole was observed within the survey area. The sett appears to be on (or very close to) the diversion route, although it appears to have been disused by badgers for some considerable time, and is currently incorporated into an active rabbit warren. It does however suggest that there are badgers within the vicinity that may use the area to forage, although discussions with the landowners at both Cyttir Mawr and Rhosygadair Fawr did not reveal any anecdotal evidence of badgers with the survey area and no other signs of badger use or habitation were observed during the field survey.

Water vole: Although the ditch north of Cyttir Mawr (Watercourse 1) was considered to be unsuitable for water vole, due to the dense scrub along the banks, the small stream west of the arable field associated with Rhosygadair Fawr (Watercourse 2) was considered to offer some potential to support water vole and was therefore surveyed. No evidence of water vole presence was observed.

Bats: Most of the hedgerows and tree belts within the survey area are considered to provide good foraging habitat and commuting routes for bats. A number of mature trees along the stream that forms the western boundary of the survey area (Watercourse 2) and along the stream north of Cyttir Mawr (Watercourse 1) may have some potential to provide roost sites. The results of the bat survey carried out in August 2002 (WYGE, 2002) confirmed that bats are present within the adjacent Phase I development site. In addition, anecdotal evidence from the landowner at Cyttir Mawr suggests that, bats are regularly seen foraging over the survey area.

3.3 Construction Impacts

3.3.1 General

The main construction impacts resulting from the diversion of the B4333 road will be land take, habitat fragmentation and possible pollution incidents. Habitat loss and fragmentation are considered as construction impacts as opposed to operational impacts as the impacts actually take place during the construction period (although obviously their effect will continue to be felt throughout the life time of the road). The habitats and species/species groups likely to be affected are discussed separately.

3.3.2 Habitats/Vegetation

Hedgerows/Tree Belts

The most important habitat feature to be impacted upon during the construction of the road diversion will be the hedgerows. Hedgerows are possibly the most important habitat feature still extant across large areas of the UK providing vital habitat and commuting route for a wide variety of animals across the countryside. They are the primary habitat for 47 species of conservation concern within the UK (including 13 species of globally threatened or declining species) more than most other habitats in the UK (JNCC, 2004).

Due to the serious decline of hedgerows (a net loss of 25% in Wales alone between 1984 and 1990) ancient and species rich hedgerows are protected by law under the Hedgerow Regulations 1997 and are listed as a priority habitat in the UK Biodiversity Action Plan. However, even hedgerows that are not considered as ancient or important are considered to be essential for the "migration, dispersal and genetic exchange of wild species" under the Conservation (Natural Habitats, &c) Regulations 1994. Reflecting this Planning Policy Guidance Note 9 (PPG9) (DoE, 1994) encourages the development of suitable planning conditions to encourage the sympathetic management of "features of the landscape which are of major importance for wild flora and fauna" (including hedgerows).

The hedgerows and tree belts immediately adjacent to the diversion route will be impacted upon by construction of the road. The footprint of the road itself (including the associated footpath/cycleway and drainage ditches) will occupy approximately 13m with an additional working width during construction assumed to be in the region of 6m either side. Hence during construction, approximately 25m of each hedgerow that will be severed by the route will be lost. This constitutes a loss of approximately 410m of hedgerow including approximately 125m that will be lost if the gated access road requires the loss of hedgerow here. Included within this is approximately 155m of hedgerow considered as species rich (Hedgerows 2, 3 & 4) including approximately 80m of the hedgerow considered as potentially *important* under the 1997 Regulations. Note that these are approximate estimates and are intended to indicate the order of magnitude of the loss and should not be taken as exact measurements.

The extent of species rich hedgerow to be lost is considered to be of **parish/neighbourhood (local) importance** and the loss of 155m of such hedgerows plus a further 255m of other hedgerows is considered to represent a **negative (slight to moderate adverse)** impact.

Improved Pasture

In addition to the hedgerow approximately 2ha of improved pasture will be lost during the construction (note that this is an approximate estimate). This type of habitat is very common and widespread and is considered to be of **negligible importance**. The magnitude of impact given the large quantity of similar habitat in the wider area is considered to be **negative (slight to moderate adverse)**.

Controlled Species

The stand of Japanese knotweed observed north of Cyttir Mawr should not be affected by the development and therefore the magnitude of impact will be **neutral (negligible)**.

Watercourses

Although the watercourses will not be impacted on directly during construction, indirect impacts such as chemical spillage and soil runoff may impact upon the ecosystem. Potential construction impacts in relation to the watercourses are discussed more fully in Section 5.

3.3.3 Fauna

Birds

Although the hedgerows are likely to support a variety of birds they are unlikely to support any species afforded special protection through inclusion on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) and the populations affected by the loss of approximately 410m of hedgerows are considered unlikely to warrant even parish/neighbourhood importance. Similarly the improved pastures are heavily grazed and hence not thought to be suitable for ground nesting birds (e.g. skylark *Alauda arvensis* or lapwing *Vanellus vanellus)*. The impact on birds during construction given the relatively small numbers affected is considered to be **negative (slight to moderate adverse)**. It should be noted that is a legal requirements to avoid damage or destruction of birds' nests during construction (Section 3.6).

Badgers

The disused badger sett is situated along the diversion route and hence will almost certainly be destroyed during construction. The sett consists of a single hole only (probably an old outlier sett) and is not considered to have been used by badgers for some considerable time, indeed at the time of survey it was incorporated into a rabbit warren. Outlier setts such as this may be used only once or at most sporadically as a temporary refuge by a single badger and are commonly over taken by foxes and rabbits. They may however be reused and extended after a considerable period of disuse. Provided this sett is not re-occupied its importance is considered to be negligible and the impact of its loss is considered likely to be **neutral (negligible)**. A re-survey to establish whether the sett has been reoccupied is recommended prior to construction work commencing (Section 3.6).

Due to the lack of other signs of badger activity and the assumption that the existing volume of traffic on the diverted road is not anticipated to increase appreciably compared with the existing B4333 road (to be closed) the impact on foraging badgers is considered to be **neutral (negligible)**.

Bats

The woodland belts along the watercourses within the survey area (Watercourses 1 & 2 - Figure E4734/02) support mature trees and although these may have some potential to support bat roosts they will not be affected by the development and the magnitude of impact will be **neutral (negligible)**.

The hedgerows that will be affected were not considered to have a high potential to support bat roosts but are likely to act as important feeding areas and commuting routes to, from and around the survey area. However, although anecdotal evidence suggests that bats do use the survey area to forage, the level of use has not been confirmed or quantified through detailed bat surveys. The total length of hedgerow to be lost during construction is 410m, which given the wide availability of similar habitat, both within the survey area and surroundings, is considered likely to have a **neutral (negligible)** effect with respect to the availability of foraging habitat for bats in the area.

If it is assumed that bats are entering the survey area from the Aberporth airfield site (the nearest confirmed roost) the width of the current B4333 road (approximately 5.5m) does not appear to present a significant barrier. However, the construction of the diverted road will create gaps of up to 25m in the short term. The extent to which this will affect bats commuting to and from the site along these affected hedgerows is not known at this stage. However, given the nature of the landscape within and around the survey area it is anticipated that bats are likely to use a number of different commuting routes thus reducing the magnitude of impact associated with the loss of a number of 25m sections of hedgerow. The magnitude of the fragmentation of a small number of potential commuting routes is

therefore considered likely to be **negative (slight to moderate adverse)**, although as noted previously in the absence of survey information the level of confidence in this assessment is low.

3.4 Operational Impacts

3.4.1 General

The operational impacts of the road diversion are likely to occur in relation to lighting, traffic flow, highway runoff and noise and vibration (habitat loss/land take having been discussed previously under construction impacts). The species/species groups likely to be affected by the impacts are discussed separately.

3.4.2 Habitats/Vegetation

Hedgerows / Tree Belts

Without adequate pollution control in place, traffic on the diverted road may generate polluted run off (principally oils) and dust that may impede the growth of the hedgerows (due to decreased photosynthesis) and similarly have a negative affect on more sensitive species within the herb layer. However as the traffic volume is anticipated to be relatively low the magnitude of this impact is considered to be **neutral (negligible)**.

Improved Pastures

As above, without adequate pollution control in place, traffic using the diverted road may generate polluted run off and dust that could affect the improved pastures. However, as the traffic volume is anticipated to be relatively low the magnitude of this impact is considered to be **neutral (negligible)**.

Watercourses

The impermeable road surface coupled with traffic spray will increase the volume and speed of runoff from the route of the road diversion. Impacts on the watercourses during the operation of the road are discussed more fully in Section 5.

3.4.3 Fauna

Birds

The road diversion may reduce the attractiveness of the hedgerows for both nesting and foraging birds due to increases in noise level, dust, vibration and traffic spray although the magnitude of such impacts is considered to be small. Although the hedgerows are considered to support a variety of common and widespread bird species such populations are considered to be too small to warrant even parish/neighbourhood importance. The operational impacts are therefore considered to be **neutral (negligible)**.

Badgers

Although the diverted road may provide a barrier to foraging and or commuting badgers it is not expected to present a more difficult or dangerous obstacle than the current B4333 road. No active setts or other signs of badger activity were observed in the vicinity of the diversion route and the magnitude of impact is therefore considered to be **neutral (negligible)**.

Bats

Lighting can discourage bats from using an area or from crossing a road. The diverted road will not be lit along the majority of its length with the only lighting installed adjacent to the southern roundabout, which will be lit in a manner designed to reduce light pollution as far as possible (Section 4). The magnitude of impacts on bats resulting from lighting is therefore anticipated to be **neutral (negligible)**.

The impact of the fragmentation of potential commuting routes and loss of foraging habitat for bats was addressed under construction impacts.

3.5 Mitigation Measures

Implementation of the following mitigation measures will further reduce the magnitude of impacts on ecology and nature conservation interests.

Construction

- In order to reduce the quantity of hedgerow to be lost consideration is to be give to amending the road layout slightly to avoid the loss of the hedgerow situated alongside the proposed gated access road route.
- New hedgerows are to be planted as soon as possible following construction to compensate for the hedgerows lost during construction. This includes the hedgerow likely to be *important* under the Hedgerow Regulations 1997. Species rich hedgerows will be planted along the entire length of the diverted road, on both sides, using native species such as hawthorn, blackthorn, gorse and elder *Sambucus nigra* preferably of local provenance. Up to 1km of new hedgerow could be planted. Standard trees should be planted along the hedges on both sides of the road and include pedunculate oak, ash and aspen (not sycamore) but should not impede visibility at the roundabouts. In addition sections of hedgerow removed from within the 6m wide area adjacent to the road during construction works will be replaced.
- The minimum amount of habitat that is practicable to enable construction of the road is to be removed during construction. Areas of hedgerow and trees close to the construction site that need not be removed should be fenced off using a highly visible barrier to minimise the chances of accidental damage. Materials, chemicals and plant should be stored or parked within the designated working width and away from natural features.
- Watercourses are to be protected at all times from accidental spillage or leaks (Section 5).
- All work that will affect habitat with the potential to be used by nesting birds (i.e. hedgerows) must be undertaken outside the breeding season (April – September). No hedgerows are to be removed between these months. Under Section 1(1) (b) of the Wildlife and Countryside Act 1981 (as amended) it is an offence for "any person to intentionally, or recklessly take, damage or destroy the nest of any wild bird while the nest is in use or being built."
- The disused badger sett observed during the field survey is to be re-surveyed prior to construction to ensure badgers have not reoccupied the sett. If the sett were to have been reoccupied mitigation will be required. This could potentially involve more detailed survey and a subsequent application for a licence from Countryside Council for Wales. Badgers are protected under the Protection of Badgers Act 1992 and hence it is an offence to wilfully kill, injure, take or attempt to kill, injure or take a badger or interfere with a badger sett by damaging destroying, obstructing access to a sett or disturbing a badger while occupying a sett.

Operation

- A long term management strategy for the new hedgerows is to be implemented in order to maintain and enhance their nature conservation value.
- Drainage designs are to ensure that run off from the road surface does not directly enter pastures or drainage ditches on adjacent land (Section 5).

Assuming the mitigation in relation to hedgerow planting takes place this should result in a net gain (up to 1km in length) of species-rich hedgerows within the study area. This gain, once the new hedgerows are established is considered to represent a **positive (beneficial)** impact of **minor** significance. The

length of the gaps created in a number of hedgerows during construction will also be reduced to around 13m (from 25m) through mitigative planting. Once established these hedgerows should result in a net gain (up to 1km) in bird habitat and potential bat foraging habitat.

3.6 Summary of Residual Environmental Effects

The overall significance of effects on ecology and nature conservation will be **minor adverse** but could be reduced with the implementation of mitigation hedgerow planting along either side of the road.

Environmental Effect	Sensitivity of Receptor	Magnitude	Nature	Duration	Mitigation	Residual Significance
Loss of 410m of hedgerow including 155m of species rich hedgerow (80m of may be considered *important* under the Hedgerow Regulations 1997)	Local	Slight to moderate	Adverse, Direct, Irreversible	Short term, Permanent	Y	Minor Adverse (mitigation hedgerow planting will result in a net gain in the length of species rich hedgerow resulting in a minor benefit)
Loss of 2ha of improved pasture	Local	Slight to Moderate	Adverse, Direct, Irreversible	Short term, Permanent	N	Negligible
Risk of pollution of watercourses	Local	Slight	Adverse, Direct, Reversible	Long term, Permanent	Y	Minor Adverse - Negligible
Impact on birds due to loss of 410m of hedgerow	Local	Slight to Moderate	Adverse, Indirect, Irreversible	Short term, Permanent	Y	Negligible
Impact on bats due to loss of 410m of hedgerow	Local	Slight to Moderate	Adverse, Indirect, Irreveraible	Short term, Permanent	Y	Minor Adverse reducing to Negligible

4.0 LANDSCAPE AND VISUAL EFFECTS

4.1 Introduction

This section addresses the landscape and visual implications of the B4333 road diversion. The assessment makes reference to a previous landscape and visual studies carried out for ES and addendum (WYGE, 2002 & 2000) prepared for Phase I and Phase II of the development.

The impact assessment methodology used in the preparation of this section has been developed from the guidance given in *Guidelines for Landscape and Visual Impact Assessment (Second Edition)* and in summary comprises:

- Establishment of the existing or baseline conditions. This includes identification of landscape character types, planning designations relating to the landscape, identification of visual receptors and the recording of landscape features in the vicinity of the road diversion.
- Impact assessment of the road diversion undertaken in relation to the baseline conditions.
- Identification of mitigation measures to offset or reduce identified impacts.
- Reassessment of impacts on the assumption that mitigation measures are put in place to determine residual impacts.

In the context of this report landscape and visual impact assessment seeks to identify the magnitude and significance of changes to the character of the existing landscape and visual resources which will arise from construction of the B4333 road diversion. Two broad categories of impact are considered:

- **Landscape impacts** are changes in the fabric, character and quality of the landscape. These could include direct impacts upon specific landscape elements (such as loss of woodland or hedgerows) or effects on landscape character and designated areas of landscape.

- **Visual impacts** relate to specific changes in the character of views and the effects of those changes on visual receptors. Receptors include road users, footpath users or residents but visual impact to the setting of cultural heritage features including those listed on the Sites and Monuments Record (SMR) is also considered as these interests are protected by planning policies.

In making the assessment magnitude of impact is considered alongside the sensitivity of individual receptors to determine the overall significance. Magnitude of impact predicts the degree to which the landscape character or view will change as a result of the B4333 road diversion. Sensitivity predicts the degree to which individual receptors will be affected by the change. Sensitivity varies between receptor types. For example a small-scale rural landscape may be more sensitive to change than an urban fringe landscape which has been modified by development whilst views from Public Rights of Way will normally be more sensitive to change than views from roads given the relative speed at which the observer moves.

In relation to the assessment of impacts on property it should be noted that the assessment is based on a best assumption from publicly accessible locations close to the properties. If it has not been possible to assess the effects on properties from public viewpoints or where confidence in predictions are low this is stated within the text.

4.2 Baseline Environment

4.2.1 Landscape and Planning Designations

The site lies within the jurisdiction of CCC and a review of local planning policy has identified that in the surrounding area the only notable landscape planning designations are:

ENV01: Special Landscape Areas

The Ceredigion Coastline is designated as a Special Landscape Area and the boundary stretches to within 0.75km of the diversion route. Policy ENV01 acknowledges the need to give special consideration to the location, scale and design of new developments within these areas. The site itself does not fall within the Special Landscape Area.

ENV03: Heritage Coast

This policy refers to developments within the Heritage Coast which at its closest point is approximately 2.6km north of the diversion route and therefore is not relevant to this development. The Heritage Coast cannot be seen from the diversion route.

4.2.2 Landscape Character

In the Coast and Countryside Strategy 2000 – 2005 produced by CCC the Aberporth area falls into the description of Undulating Countryside:

"...a landscape characterized by small farms and features moulded by agricultural practices over many generations - a dense field pattern with hedgerows and woodlands."

The landscape surrounding the diversion route is generally undulating agricultural and grazing farmland interspersed with hedgerows and woodland planting areas. Small farms and settlements are dotted throughout the landscape connected by a network of relatively busy roads.

The landscape and visual resources of Aberporth airfield and its surrounding area are described further in the Phase II (WYGE, 2000) Environmental Statement.

4.2.3 Existing Landscape and Visual Resources

The main landscape features along and around the route of the road diversion were identified. An area 1km either side of the diversion route but taking into account the undulating topography was considered. These can be summarized as follows:

- Agricultural and grazing farmland with a dense pattern of hedgerows and mature hedgerows creating field boundaries.
- Aberporth airfield to the east of the diversion route which includes an asphalt runway surrounded by mown grass and airport buildings.
- Isolated houses and farms dotted through the landscape.
- The settlement of Blaenannerch to the south east of the diversion route.
- A small sewage treatment works to the west of the diversion route.

4.2.4 Visual Receptors

The visual receptors along and around the route of the road diversion include the setting of designated landscapes and features protected under planning policy (see above) and the views experienced by the following groups of people. These groups of people are considered to be those most likely to be affected by any change in visual character caused by the road diversion:

- People resident at properties.
- Travellers on roads and lanes.

- Those using recreational facilities such as footpaths where user enjoyment is partly a function of views into the surrounding landscape.

4.2.5 Existing Views

Views of the road diversion route are limited to specific locations. The diversion route is generally screened from the surrounding areas by hedgerow boundaries and by hedges adjacent to the roads. There are no Scheduled Ancient Monuments, protected landscapes or notable features within 1km of the diversion route.

Numerous residential properties affording views of the diversion route are dotted around the surrounding area. To the south of the diversion route is the settlement of Blaenannerch from which views of the site are available from the properties on the northwest corner of the settlement.

Immediately surrounding the diversion route are four sites listed in the SMR which will afford views of the diverted B4333 road. There are also six listed buildings within 1km of the diversion route.

Lying immediately south of the diversion route is the A487 trunk road which has glimpsed views towards the diversion route through the adjacent hedgerows. Roads north of the diversion route include the road to Maes Glas, the B4333 road and the road to Pencnwc. Hedgerows line the road to Pencnwc preventing views towards the road diversion and generally hedgerows run along the length the other roads screening the view although glimpsed views are available.

Numerous footpaths are situated to the west of the road diversion and generally views towards the diversion route from these are screened by hedgerows and other vegetation.

4.3 Construction Impacts

During construction there will be temporary impacts on the local landscape associated with the presence of construction plant, heavy goods vehicles, personnel and stored materials plus the earthworks themselves. The diversion of the access route to Cyttir Mawr and associated Public Right of Way will cause some disruption to access during construction. The farm buildings and sewage treatment works adjacent to the diversion route may also receive some disruption to access during construction. Landscape and visual impacts associated with construction activities are likely to be **slight adverse** in magnitude owing to the **temporary** nature of these impacts and if the mitigation measures described below are implemented the impacts are likely to be further minimised.

4.4 Operational Impacts

4.4.1 General

This section summarises the landscape and visual impacts that will result from the construction of the B4333 road diversion. The potential landscape and visual impacts are summarised in the tables included in Appendix D the location of the receptors and the key views are shown on Figure E4734/03 included in Appendix B.

4.4.2 Landscape Character

Overall it is considered that the magnitude of impact on landscape features will be **moderate adverse** with the removal of sections of hedgerows being the most significant impact. The severance of the fields may also result in some areas of land being unusable to farmers and disrupt the traditional field pattern. The diversion of the access route to Cyttir Mawr and the diversion of the associated Public Right of Way when completed will result in little interruption to these features. The farm buildings and sewage treatment works adjacent to the diversion route will on the whole be unaffected by the development. No protected or designated landscapes will be affected by the road diversion and there will be little change to the landscape character of the area.

4.4.3 Visual Receptors

It is considered that the impact of the development on the residential areas and properties within the surrounding area will generally be **slight adverse** in magnitude with glimpsed views of the site being available from various locations but with hedgerows and other vegetation helping to screen the views. The settlement of Blaenannerch will be affected. Being situated close to the existing road junction there will be a change in the existing views and views of the road diversion and roundabout will be available from the settlement. Cyttir Mawr is located within a close distance of the diversion route and the view from this property will also receive a **moderate adverse** impact. This impact could be reduced by the implementation of off-site planting to screen the view of the road from the property. Other properties where the road will create a **moderate adverse** impact include Pen-y-bryn and Maes-y-coed.

The impact on the SMR sites and listed buildings within the immediate vicinity of the road diversion will be **slight adverse** in magnitude, due to clear views available from the SMR sites and glimpsed views from some listed buildings.

The footpaths in the vicinity of the road diversion are generally lined with hedges along their length and therefore views from these are limited due to the screening vegetation. The Public Right of Way to Cyttir Mawr will receive a **moderate adverse** impact due to the fact that a section of this is to be diverted. However the magnitude of impact on the majority of the footpaths within the study area is **slight adverse**.

The views from the surrounding road network are generally screened by the associated hedgerows. The magnitude of impact on the B4333 road and the A487 trunk road will be **moderate adverse** at the locations where these roads will be affected by the diversion. For the majority of the B4333 road and A487 trunk road the views of the road diversion are screened by vegetation.

The lighting at the roundabout with the A487 trunk road will be visible from the receptors identified in Appendix D and at night-time the roundabout will be more prominent than the unlit sections of the rest of the road. The roundabout to the north of the scheme has already been approved as part of the Phase I development and therefore lighting at this roundabout has not been assessed as part of this assessment.

4.5 Mitigation Measures

The following have been identified as mitigation and enhancement measures, these could be implemented through the preparation of a Landscape Mitigation Strategy for the road diversion:

Design

- Retain hedgerows and trees where possible and when removing sections of hedgerow be careful to remove only what is necessary for construction to take place.
- Off site planting to be considered to screen the views of the of the road diversion from properties with clear views of the diverted road in particular Cyttir Mawr to the west.
- Existing site vegetation, in good condition, to be retained wherever possible.
- Implement hedge and tree planting along the length of the road diversion to help to integrate the road into the surroundings. Use native species similar to existing species.
- Lighting to be implemented at the roundabout to be full cut off lighting to direct the light downwards and minimise pollution. Consideration is also be made to the style of the lighting to ensure it fits with the local character of the area.

- For the location where the existing road is to become disused at the junction near Blaenannerch adequate landscaping to be implemented to integrate the disused land into the surrounding area. Such landscaping could include hedge planning at the former junction along the A487 trunk road.
- For the location where the footpath/cycleway is to be constructed along the length of the road suitable materials to be used and consideration to be given to linking the route to existing cycle/footpath routes. Signage to be implemented showing the route of the diverted footpath to Cyttir Mawr to the west.
- Proposed planting species to be in accordance with the National Plant Specification.

Construction

- The vegetation that is to be retained to be protected as far as possible from the effects of the construction works. Safety fencing to be erected around trees and shrub planting areas.
- Night time working to be limited to reduce the impact of lighting on adjacent visual receptors.
- Suitable alternative footpath and diversion signs to be provided during construction to minimise disruption to pedestrians.

Operation

- Provision for the long-term maintenance and management of all planted areas, this management plan is to include management of the new hedgerows to maintain and enhance their nature conservation value.
- Provision for the long-term maintenance of all hard landscaped areas.

4.6 Summary of Residual Environmental Effects

The overall landscape and visual impact of the development will be **slight to moderate adverse** in magnitude. The mitigation measures proposed will slightly reduce the overall impacts identified above. Further reductions to the impact of the scheme will occur if detailed mitigation plans were included with the proposals. Mitigation measures should aim to minimise the removal of hedgerows, the severance of fields and the visual impact to Cyttir Mawr. The overall significance of effects on landscape character and visual quality will be **moderate to minor adverse.**

Environmental Effect	Sensitivity of Receptor	Magnitude	Nature	Duration	Mitigation	Residual Significance
Visual impact of construction works	Local	Slight	Adverse, Direct, Reversible	Short term, Temporary	Y	Minor Adverse
Change in landscape character following construction	Local	Slight - Moderate	Adverse, Direct, Irreversible	Long term, Permanent	Y	Moderate - Minor Adverse
Change in visual quality following construction	Local	Slight - Moderate	Adverse, Direct, Irreversible	Long term, Permanent	Y	Moderate - Minor Adverse

5.0 WATER ENVIRONMENT

5.1 Introduction

This section addresses the impacts of the diversion of the B4333 road in relation to the water environment including surface water and groundwater features. Impacts on the water environment from the overall Phase II development have already been assessed in the Phase II Environmental Statement (WYGE, 2000) which should be read in conjunction with this section.

5.2 Baseline Environment

5.2.1 Surface Water Drainage

Surface water from the Aberporth airfield enters a culvert to the east of the B4333 road. This culvert runs beneath the B4333 road and discharges to the west of it into what is effectively the head water of the Nant Arberth (Figure E4734/04 in Appendix B) just south of Maes-y-coed. The stream flows approximately 50m to the east of the northern part of the road diversion route.

Four tributaries join the Nant Arberth upstream of the A487 trunk road one of which originates from a spring (Figure E4734/04 in Appendix B) at approximately NGR SN 241 493 to the south of the Nant Arberth. The Nant Arberth then flows in a southerly direction before joining the Afon Teifi at Llechryd. The Afon Teifi discharges to Cardigan Bay at Poppit Sands near Cardigan.

Other surface water features include an overgrown ditch running along the eastern side of the existing B4333 road. The Nant Arberth and other surface water features are classified as being of **local importance** given their size and local nature.

To the west of the B4333 is a private sewage treatment works which treats foul drainage from the airfield. Treated effluent is discharged via a 100mm diameter pipe into the head stream of the Nant Arbeth at NGR 2243 2495. This continuous treated discharge was granted consent by the Environment Agency in 1964 and must comply with the discharge standard of 30 mg/l suspended solids and 20 mg/l BOD. There are no main public sewers located in close proximity to the site.

5.2.2 Surface Water Flooding

Neither the existing B4333 road nor the route of the road diversion is situated within the fluvial floodplain. However, there are reports of the B4333 road flooding in the vicinity of the airfield drainage culvert outfall. The storm water management design for Phase I of the development will address this issue of flooding around the B4333 road.

5.2.3 Surface Water Quality

Chemical and biological water samples were taken on 17 October 2000 from the Nant Arberth upstream and downstream of the sewage treatment works. The results of water quality sampling are detailed in Table 5.1. On the day of sampling effluent was not being released from the sewage treatment works.

Table 5.1 Summary of Water Quality within the Nant Arberth

	Upstream of sewage treatment works		Adjacent to sewage treatment works	Downstream of sewage treatment works
Physico-chemical				
Depth (mm)	50-400	-	50	200-300
Temperature (°C)	7	-	9	8
Flow (m/s)	5	-	2.5	3.5
pH	6.4	-	6.6	6.6
BOD (mg/l)	<1	-	<1	<1
Ammonical Nitrogen (mg/l)	<0.100	-	0.183	0.149
Suspended Solids (mg/l)	4	-	4	7
Biological				
BMWP	49	59	37	29
Total taxa (biological families)	11	13	10	9
ASPT	4.5	4.5	3.7	3.2

Based on the available data, the chemical water quality of the Nant Arberth in the vicinity of the airfield is considered to be of good quality with low BOD (biological oxygen demand) at all sampling points. A slight increase in ammonical nitrogen below the sewage treatment works indicates that water quality is influenced by the discharge of treated sewage effluent. The impact of the sewage treatment discharge will diminish downstream as organic pollution is progressively broken down by natural processes. Concentrations of ammonical nitrogen may also be influenced by runoff from the surrounding agricultural land.

Biological water quality sampling (to family level) shows that the BMWP and ASPT scores fall to a small degree downstream of the sewage treatment works indicating that more pollutant tolerant taxa are present. During the water quality survey in 2000 the ditch running adjacent to the B4333 road was stagnant and had a low BMWP and ASPT (Table 5.2) (although these may not be valid as the system is for running water) probably due to low oxygen levels which are typical for this type of watercourse.

Table 5.2 Summary of Biological Water Quality in the Ditch Adjacent to the B4333

	Ditch Adjacent to B4333
Total BMWP	5
Total taxa (biological families)	3
ASPT	1.7

Only one minor pollution incident has affected the Nant Arberth according to Environment Agency records (WYGE, 2000). This was a release of silage liquor from a silage effluent tank at Rhosygadair Fawr (NGR SN 237496) on 31 October 1995. The only other existing risk to water quality is from potential spillages in the bulk fuel installation area of the airfield.

5.2.4 Groundwater

Ceredigion is underlain by impermeable rocks generally without groundwater except at shallow depth. The Environment Agency Groundwater Vulnerability Map for Pembroke shows that the airfield and a large proportion of the surrounding area are classified as a non-aquifer which means that the strata is negligibly permeable but that groundwater is of importance for local domestic supplies and maintaining river base flows. No Groundwater Source Protection Zones are allocated in the vicinity of the airfield. The nearest area with an aquifer classified as vulnerable is located approximately 800m to the south of the airfield and is classified as a minor aquifer.

The Environment Agency does not have any records of any abstraction licences within a 250m radius of the airfield and CCC only have records of approximately five private water supplies within the wider Aberporth area. However, it is possible that there are abstractions in the local area that are exempt from licensing for which information is unavailable.

5.3 Construction Impacts

The Environment Agency is responsible for protecting "controlled waters" from pollution. Controlled waters are defined as all watercourses, lakes and water contained in underground strata. Under Section 85 of the Water Resources Act 1991 is an offence to pollute such waters, either deliberately or by accident, and the formal consent of the Environment Agency is required for any planned discharge to controlled waters, either direct or via discharge to soakaways.

During construction there is a risk of a pollution incident occurring as a result of an accidental spillage of oil or chemicals due to the operation of construction plant and storage of materials. The excavation of soils could result in a sediment laden runoff being discharged into the Nant Arberth and thus increasing its suspended sediment load. The risk is increased where the route of the road diversion runs in proximity to the stream upstream of the sewage treatment works.

Downstream impacts on water quality and aquatic ecology could arise as a result of a change in temperature, decreased light penetration, deposition of fines or a drop in dissolved oxygen content. Construction impacts will be a **temporary** in nature lasting only for the duration of the construction works. The magnitude of this impact is **slight adverse**. However, to prevent or minimise the possibility and to deal with events should they occur Environment Agency Pollution Prevention Guidelines (PPGs) are to be followed during construction.

Pollution prevention equipment will be kept in the construction area and procedures for use put in place. If works take place upstream of the sewage treatment works within 25m of the Nant Arberth the stream should be visually inspected during the works to detect any changes in colour or turbidity which may indicate a temporary water quality decline. If on a visual inspection the stream appears to be excessively turbid the Environmental Agency should be contacted regarding the appropriate action.

5.4 Operational Impacts

The construction of the carriageway surface along the route of the road diversion will result in an increase in impermeable surface. Reduced infiltration will lead to an increase in surface water runoff rates. Management of this surface water runoff through the highway drainage system is important as increased runoff rates could lead to localised flood events.

Highway drainage will be accommodated by the construction of two swale ditches running parallel with

either side of the new road. Highway drainage will be retarded and filtered by the other vegetation in the ditch into the ground. The grassed depression of the swale ditch will normally be dry during dry weather conditions. This will allow the ditch to provide temporary storage for storm waters during heavy rainfall events preventing an increase in downstream water levels in the Nant Aberth during peak flows. No foul water drainage needs to be accommodated. There will be a **negligible impact** on the flooding regime of the Nant Arberth.

Routine highway runoff could cause pollution of surface waters. Silt, hydrocarbons, heavy metals and organic chemicals originating from general road degradation, incomplete fuel combustion, small oil or fuel leaks and windscreen washing could enter the surface water system. On roads with an Average Annual Daily Traffic Flow of less than 15000 vehicles there are virtually no noticeable effects from routine highway runoff on the receiving water quality (Stationary Office, 1993) and so the magnitude of this impact is considered to be **slight adverse**. Such impacts will be intermittent (with the greatest impact occurring after rainfall events) over the **long term**.

There is also a risk on any road that vehicle collisions could result in the pollution of surface waters, particularly if tankers are involved, due to spillage of oil or chemicals from vehicles. In comparison to routine highway runoff the runoff resulting from a vehicular collision could be seriously polluted. The magnitude of this impact is **slight adverse**. Such impacts will be **short term** in nature.

The construction of swale ditches will facilitate the removal of suspended sediment and pollutants in highway runoff. Residues and organic matter within the runoff will be retained in the top layer of soil and vegetation to eventually be broken down by bacteria. Swale ditches are considered to be 60-90% effective at removing suspended solids and 70-90% effective at removing hydrocarbons (Stationary Office, 1993) but in order to further prevent pollution from hydrocarbons oil interceptors will need to be installed prior to the discharge of highway runoff into the swale ditches. These help to separate highway pollutants such as oils and petrol.

5.5 Mitigation Measures

The provision of the mitigation measures outlined below will reduce the risk of a pollution incident during construction works and enable highway runoff to be conveyed to the Nant Arberth without detrimental effect on water quality and associated ecosystems.

Construction

- The construction site will be established with a buffer zone of 25m around any watercourse including the Nant Arberth. Machinery that needs to work within this buffer zone will be checked daily for fuel and oil leaks.
- The contractor will be made aware of and comply with the requirements of PPG21 *Pollution Incident Response Planning* and prepare a Pollution Incident Response Plan.
- The contractor will be required to keep sufficient spill kits on site at all times so that one can be deployed to any part of the construction site within 15 minutes. Spill kits to contain absorbent materials, booms for containing spills on water and the means of attaching them to the banks, empty containers for catching leaking fluids and appropriate personal protective equipment.
- Construction vehicles will only be active when required and regularly maintained to reduce the risk of leakage or spillage. Maintenance work will be carried out on impervious drip trays to prevent spillage of fuel and oil.
- Immobile plant and fuels, oils and chemicals will be stood on impervious drip trays or be secured/locked in appropriately bunded areas. Refuelling operations will be carried out within a designated construction site compound sited away from a watercourse but if this is unavoidable carried out on impervious drip trays.

- Leaking or empty drums will be removed from site at once.

Operation

- Highway drainage system will incorporate oil interceptors prior to discharging into the swale ditches to prevent pollution of surface waters.
- Swale ditches to be designed in accordance with the principles of Sustainable Urban Drainage.

5.6 Summary of Residual Environmental Effects

There is a risk of a pollution incident potentially having an adverse affect on the water quality of the Nant Arberth during construction or operation. However the implementation of pollution control measures to mitigate the effects of highway runoff or an accidental spillage will result in an overall environmental effect of **negligible/minor significance.**

Environmental Effect	Sensitivity of Receptor	Magnitude	Nature	Duration	Mitigation	Residual Significance
Pollution risk during construction	Local	Slight	Adverse, Direct, Reversible	Temporary, Short Term	Y	Minor Adverse - Negligible
Pollution risk from routine highway runoff	Local	Slight	Adverse, Direct, Reversible	Permanent, Long Term	Y	Minor Adverse - Negligible
Pollution risk from a road traffic accident resulting in chemical or fuel spill	Local	Slight	Adverse, Direct, Reversible	Permanent, Short Term	Y	Minor Adverse - Negligible

6.0 NOISE

6.1 Introduction

This section addresses the impacts of the diversion of the B4333 road in relation to noise impacts. Impacts on the noise climate from the overall Phase II development have already been assessed in the original Environmental Statement (WYGE, 2000) with further information being provided in the Phase I addendum (WYGE, 2002). The current noise assessment is based upon the findings of the previous assessments. This section should be read in conjunction with the original Phase II ES.

6.2 Baseline Environment

Noise in the vicinity of Aberporth airfield is predominantly dominated by road traffic along the A487 trunk road and current alignment of the B4333 road. Baseline noise monitoring was undertaken for input into both the Phase I and Phase II Environmental Statements in October 2002 and October 2000. The data collated in both years compared well indicating that the noise climate had not noticeably changed over the two year period. The results of the ambient noise surveys undertaken for the Phase I and Phase II assessments are considered to still accurately reflect the current noise climate in the area and therefore no additional baseline noise monitoring has been undertaken. The noise levels recorded were typical of road traffic noise and light industrial use.

6.3 Construction Impacts

Noise from construction activities, plant and traffic could arise during the construction period. Construction noise impacts were addressed in the original Phase II Environmental Statement and Phase I addendum. Despite alterations in the alignment of the B4333 diversion route it is not anticipated that that the construction impacts will vary from the findings of the previous assessments.

6.4 Operational Impacts

The original Environmental Statement and addendum identified that the diversion of the B4333 road whilst carrying a higher volume of traffic will (due to the increasing distance away from noise sensitive receptors) reduce noise impacts at the majority of properties within Bleanannerch. The magnitude of noise impact was demonstrated by undertaking calculations of noise levels for the property known as Pen-y-bryn. This property will experience a noise level increase of 0.6 dB due to road traffic noise based on worst case traffic flows. This will constitute a **slight adverse** impact. This assessment still applies to the current alignment of the B4333 road diversion.

6.5 Mitigation Measures

The following mitigation was recommended for implementation during the construction phase:

Construction

- Restrictions on working hours to avoid unnecessary disturbance.
- Restrictions on the types of noise levels of plant and equipment to be used on the construction site.
- Sensible routing of construction traffic to avoid sensitive areas.
- Regular monitoring of site activities with rapid response to problems and complaints.

No additional mitigation measures are proposed for the diversion of the B4333 road due to the conclusion that the diversion will reduce noise impacts from road traffic noise at the majority of properties in Blaenannerch by taking vehicles further away from the village periphery therefore having a beneficial effect of reducing noise impacts.

6.6 Summary of Residual Environmental Effects

The new alignment of the B4333 road diversion does not change the original findings of the previous Phase II Environmental Statement and Phase I addendum.

Environmental Effect	Sensitivity of Receptor	Magnitude	Nature	Duration	Mitigation	Residual Significance
Construction noise	Local	Slight - Moderate	Adverse, Direct, Reversible	Temporary, Short Term	Y	Minor - Moderate Adverse
Operational noise at Pen-y-bryn	Local	Slight	Adverse, Direct, Reversible	Permanent, Long Term	N	Minor Adverse
Operational noise at Blaenannerch	Local	Slight	Beneficial, Direct, Reversible	Permanent, Long Term	N	Minor Beneficial

7.0 AIR QUALITY

7.1 Introduction

This chapter addresses the diversion of the B4333 road in relation to air quality impacts. Impacts on air quality from the overall Phase II development have already been assessed in the Phase II Environmental Statement (WYGE, 2000) and an air quality addendum (WYGE, 2001) which should be read in conjunction with this section. The current air quality assessment is based upon the findings of these reports and considers the potential impact of the diversion of the B4333 road on the conclusions of the previous assessments.

7.2 Baseline Environment

7.2.1 Background Air Quality

Baseline air quality data is presented in the Phase II Environmental Statement and the air quality addendum report and has not been reproduced here. Baseline data shows that pollutant levels in the vicinity of the site are well below UK National Air Quality Standards (UKNAQS) objectives to be achieved by 2005.

Road traffic using the A487 trunk road and B4333 road are considered to form the primary source of emissions to air in the vicinity of the site. The primary pollutants of concern with regard to road traffic are widely acknowledged as being nitrogen dioxide (NO_2) and particulate matter (PM_{10}). Future air quality predictions undertaken as part of the air quality addendum (calculated using the Design Manual for Roads and Bridges (DMRB) assessment method) concluded that pollutant concentrations were likely to remain well below the current UK National Air Quality Strategy objective levels. However the diversion of the B4333 road was not assessed in the Phase II Environmental Statement or the air quality addendum report. In these assessments road traffic was assumed to continue to use the existing alignment of the B4333 road.

For the purpose of this assessment the impacts of the diversion of the B4333 road have been assessed against the UKNAQS objectives for NO_2 and PM_{10} details of which are summarized in Table 7.1. The UKNAQS is discussed in more detail in the Phase II Environmental Statement and air quality addendum report.

Table 7.1 - UK National Air Quality Strategy Objectives

Pollutant	Objective	Measured as	To be achieved by
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31/12/05* 1/1/2010**
	40 µg/m^3	Annual Mean	31/12/05* 1/1/2010**
Particulates (PM_{10})	50µg/m3 not to be exceeded more than 35 timers per year	24-hour mean	31/12/05* 01/01/10**
	40µg/m3	Annual Mean	31/12/05* 01/01/10**

* = objective given in the Air Quality Regulations 2000
** = limit value given in the Air Quality Limit Values Regulations 2001

7.3 Construction Impacts

7.3.1 Sources of Emissions

During construction emissions to air are likely to be very similar to those discussed in the addendum report and are likely to include:

- Generation of airborne particle emissions (dusts) on site during earthworks and as a result of windblown construction materials.
- Generation of exhaust fumes by earthmoving and construction plant throughout the construction programme.
- Release of Volatile Organic Compounds (VOC) from stored fuel or chemicals.

The magnitude of impact related to potential construction impacts is predicted on a qualitative basis.

NB. The magnitude of impact for the different construction activities has been estimated based on a worst-case scenario (i.e. assessment does not take into account mitigation measures to reduce dust emissions - appropriate mitigation measures are presented later in this section).

7.3.2 Dust

During the construction of the diversion the potential for dust to be emitted will be heavily influenced by the nature of activities taking place. Earthworks in particular are likely to result in significant dust generation. It is anticipated that works will comprise standard highway construction resulting in the generation of HGV movements during the import and export of materials and that the stockpiling of materials on site will be required in the short-term.

The magnitude of impacts resulting from elevated dust emissions depends on the potential for dust to firstly become, and secondly remain, airborne prior to returning to the surface as a deposit. Unlike other atmospheric pollutants the presence of dust and its deposition is particularly dependant on prevailing weather conditions with areas most consistently affected being located downwind of emission sources. Although temporary elevation in dust levels is inevitable as part of the construction works, particularly where construction takes place during dry conditions, it is considered that the implementation of suitable mitigation measures will effectively minimise potential dust impacts.

Construction impacts are anticipated to occur over the short term being temporary in nature. The magnitude of dust impact is predicted to be **slight adverse** in nature in view of the risk of dust nuisance complaints rather than risk of exceeding the UKNAQS objectives.

7.3.3 Construction Traffic

Exhaust emissions from plant and other equipment will be an additional source of emissions to air during each construction phase. The import and export of material will potentially result in a large number of Heavy Goods Vehicle (HGV) movements. It is considered that the HGV trips generated during construction are likely to be significant although short-term in nature primarily affecting only those receptors in the immediate vicinity of the development. The potential impact of construction traffic emissions is therefore assessed as being **slight to moderate adverse** and short-term in nature. As assessment of impacts resulting from construction traffic has been undertaken in the absence of relevant traffic data confidence in this prediction is currently low.

7.3.4 Fuel and Chemical Storage

In relation to the potential release of VOCs from on site fuel storage containers taking into account the scale of the development the magnitude of impact is assessed as being **negligible**.

7.4 Operational Impacts

The development of the airfield will generate an influx of road traffic into the area and on the local road network. A DMRB Stage 2 Local Impact Assessment was undertaken by WYGE in 2001 to assess the impact on air quality (WYGE, 2001). Following the DMRB assessment it was concluded that the increase in traffic flow generated by the development was unlikely to have an adverse impact on local sensitive receptors due good air quality in the vicinity of the development site.

Following review of available plans and previous DMRB calculation sheets it is considered that the diversion of the B4333 road will have no impact on the conclusions of the previous assessments as

only the route of access is to change not the anticipated volume of traffic. It is acknowledged that the potential impact on specific receptors may alter marginally due to the altered B4333 road alignment but no exceedences of the UKNAQS objectives are anticipated as a result of the diversion. It is therefore considered that the conclusions of the Phase II Environmental Statement and air quality addendum report still stand although it is likely that the results of the DMRB calculations would be different should they be repeated.

7.5 Mitigation Measures

There is currently no formal Code of Practice on the control of emissions from construction sites although several local authorities and large construction companies have independently introduced best practice methods to reduce construction impacts on the environment. A New Code of Practice for controlling such emissions from construction sites is being developed by the Building Research Establishment (BRE) and it is envisaged that this will consider individual construction processes, activities that generate particles, methods of controlling emissions and management and monitoring measures. Through pre-project planning and management, pollution emission from the construction phase will be controlled in an effective manner. All contractors on site will have a duty to adopt Best Practicable Means to minimise dust and odour nuisance arising from site remediation and construction activity. Provided below is a guide to Best Practicable Means to minimise dust. The guide is not an exhaustive list, but presents the minimum considered necessary to reduce impacts:

Construction Phase

- In order to prevent dust nuisance to adjoining occupiers particularly during dry weather there will be adequate screening and damping down during all excavation, clearance works and other site preparations including the storage of construction materials.
- Major haul roads are to be watered as necessary to minimise dust nuisance. Where practicable haul roads are to be stabilised (compacted) to reduce off site transfer of soil and other materials.
- Paved roads near to exits are to be kept clean and vehicles transporting dusty materials onto and off site will be suitably covered.
- Suitable wheel washing equipment will be provided at site entrances and exits.
- Storage locations for all materials that create dust, including soil, must be aggregated where possible to avoid the creation of many stockpiles, adequately screened to prevent wind loss and damped down where practical when being handled.
- Drop heights are to be minimised and chutes will be used where possible.
- Lorries and plant with diesel engines on or off site will be well maintained in order to reduce emissions of visible smoke. Engines will not be left running unnecessarily, and plant and vehicles must not be parked in a position which could give rise to nuisance from exhaust fumes.
- All site vehicles will have vertical exhausts to limit surface dust resuspension.
- Contractors must take all precautions to prevent the emissions of fumes from stored fuel oils, for safety and potential nuisance reasons.
- Regular checks of the surrounding highways will be undertaken to monitor the levels of dust migrating off-site and to ensure effective implementation of mitigation measures.
- Exposed soils will be seeded as soon as possible following construction and will be damped down until the vegetation prevents wind erosion.
- Dusty works will be programmed outside dry windy weather.

Prior to commencing remediation and construction works, the contractor should discuss the need for dust and any other monitoring with CCC Environmental Health Department and should continue to liaise with the council throughout the construction stage.

No mitigation measures are deemed relevant to the operation phase of the diversion.

7.6 Summary of Residual Environmental Effects

Construction impacts will be temporary in nature lasting only for the duration of the construction phase. Residual significance is therefore considered to be **negligible.** Operational impacts will be long term in nature but are not considered to pose any risk of exceeding the UKNAQS objectives for the traffic related pollutants NO_2 and PM_{10}. Therefore residual significance is considered to be **negligible to minor adverse.**

Environmental Effect	Sensitivity of Receptor	Magnitude	Nature	Duration	Mitigation	Residual Significance
Dust emission during construction	Local	Slight - Moderate	Adverse, Direct, Reversible	Short Term, Temporary	Y	Negligible
Road traffic emissions during operation	Local	Slight	Adverse, Direct, Reversible	Long Term, Permanent	Y	Minor Adverse - Negligible

8.0 ARCHAEOLOGY AND CULTURAL HERITAGE

8.1 Introduction

This section addresses the impacts of the diversion of the B4333 road in relation to archaeology and cultural heritage. A separate archaeological assessment report (OAN, 2004) has been produced by Oxford Archaeology North on behalf of WYGE. This report contains an assessment of the current road diversion alignment and is included as Appendix C. The findings of this assessment in relation to the road diversion are summarised here.

8.2 Baseline Environment

In additional to the twenty three sites archaeological importance identified during previous archaeological assessments an extra eleven sites have been identified within a 1km corridor along the diversion route. Of these three are listed in the SMR/National Monuments Record (NMR) and eight were identified from cartographic sources. The three sites from the SMR/NMR are a Bronze Age round cairn to the east of the diversion route at Cgru-gwyn, a cremation burial to the southwest at Tremaen and the standing buildings of Pen-y-bryn farm which has recently been added to the SMR. Other sites are post-Medieval structures including houses and farms at Crug-gwyn, Cyttir Mawr and Pen-llas along with an unnamed structure shown on the tithe map, several quarries, a spring and the sewage treatment works. No Scheduled Ancient Monuments or Listed Buildings are found along the diversion route. The possible cairn and cremation burial are considered to be of **regional importance** and the other sites of **local importance**.

8.3 Construction Impacts

Construction of the B4333 road diversion will directly impact upon two sites of archaeological importance. These are the spring located at the junction of field boundaries to the south of the sewage treatment works and an un-named rectangular structure between the sewage treatment works and Pen-y-bryn farm. A rapid identification walkover survey is required to inform on any above-ground remains. The footprint of the field access road to the west of Pen-y-bryn may also encroach onto the area of a rectangular airfield structure although the present state of preservation of this site has not been ascertained. Likewise construction of southern roundabout may impact on the site of Pen-llas house. The separate archaeological assessment report (OAN, 2004) in Appendix C provides a detailed assessment of the construction impacts.

8.4 Operational Impacts

No impacts on archaeology are anticipated once the road is operational.

8.5 Mitigation Measures

It is recommended (in the absence of a rapid identification walkover survey) that an archaeological evaluation be undertaken at selected sites. The precise nature of the evaluation programme will be subject to the rapid identification walkover survey yet to be undertaken. However the evaluation is envisaged to involve:

Archaeological Evaluation

- Targeted exploratory archaeological evaluation trial trenching of the un-named rectangular structure.
- Targeted exploratory archaeological evaluation trial trenching of the site of Pen-llas house if the footprint of the road diversion affects it.
- General area around the cremation burial and round barrow to be targeted with evaluation trenches as they may yield sub-surface remains.

8.6 Summary of Residual Environmental Effects

Subject to undertaking of a walkover survey the significance of effects on archaeological interests is assessed as follows.

Environmental Effect	Sensitivity of Receptor	Magnitude	Nature	Duration	Mitigation	Residual Significance
Un-named rectangular structure	Local	Slight - Moderate	Adverse, Direct, Reversible	Short Term, Permanent	Y	Minor Adverse - Negligible
Spring	Local	Slight - Moderate	Adverse, Direct, Reversible	Short Term, Permanent	Y	Negligible
Cremation burial and round barrow	Regional	Slight - Moderate	Adverse, Direct, Reversible	Short Term, Permanent	Y	Minor Adverse - Negligible
Rectangular ancillary airfield structure	Local	Moderate	Adverse, Direct, Reversible	Short Term, Permanent	Y	Minor Adverse - Negligible
Pen-llas house	Local	Slight - Moderate	Adverse, Direct, Reversible	Short Term, Permanent	Y	Minor Adverse - Negligible

9.0 CONCLUSIONS

9.1 Introduction

A diversion of the B4333 road is required to provide a sufficient safety zone for the Aberporth airfield runway extension and to improve the highway infrastructure. To provide a sufficient safety zone for the 280m runway extension and space for approach lighting and landscaping a diversion of the B4333 road is required. The diversion route will run from a new roundabout to be constructed at NGR SN 245 494 to the A487 trunk road at NGR SN 240 490 where a second roundabout will be constructed.

9.2 Ecology and Nature Conservation

During construction up to 410m of hedgerow including 155m of species-rich hedgerow will be lost. This will also result in the loss of habitat for small numbers of common bird species and foraging habitat and commuting routes for bats. The overall significance of effects on ecology and nature conservation will be **minor adverse** but could be reduced with the implementation of mitigation hedgerow planting along either side of the road. Net gain in the length of species-rich hedgerows (by up to 1km) as a result of mitigation planning with a corresponding increase in habitat for common bird species will offset the adverse impacts associated with the operation of the road.

9.3 Landscape Character and Visual Impact

The diversion route is generally screened from the surrounding areas by hedgerow boundaries and by hedges adjacent to the roads. However numerous residential properties affording views of the diversion route are dotted around the surrounding area. The overall significance of effects on landscape character and visual quality will be **moderate to minor adverse.** Further reductions to the impact of the scheme will occur if detailed mitigation plans were included with the proposals.

9.4 Water Environment

The main watercourse in the study area is the Nant Arberth. There is a risk of a pollution incident potentially having an adverse affect on the water quality of the Nant Arberth during construction or operation. However the implementation of pollution control measures including swale ditches and pollution traps will result in an overall environmental effect of **negligible/minor significance.**

9.5 Noise

The new alignment of the B4333 road diversion does not change the original findings of the previous Phase II Environmental Statement.

9.6 Air Quality

Currently air quality in the vicinity of the development site is good. It is considered that the new alignment of the B4333 road will not change the conclusions of the previous assessments as only the route of access is to change not the anticipated volume of traffic. It is acknowledged that the potential impact on specific receptors may alter marginally due to the altered B4333 road alignment but no exceedences of the UKNAQS objectives are anticipated. It is therefore considered that the conclusions of the Phase II Environmental Statement and air quality addendum report still stand

9.7 Archaeology and Cultural Heritage

Subject to undertaking of a walkover survey the significance of effects on archaeological interests will be of **negligible/minor adverse** significance provided that an archaeological evaluation be undertaken at selected sites prior to construction of the road diversion in order to record those features that will be lost due to construction.

9.8 Overall Conclusion

Mitigation measures have been identified to reduce the magnitude of environmental impacts associated with the road diversion. If these mitigation measures are implemented this will result in the diversion of the B4333 road at Aberporth airfield having minimal environmental impact.

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Other data sources:

Aerial photographs – http://multimap.com
Explorer Map 198 - Cardigan and New Quay
http://www.ccw.gov.uk

APPENDIX A

Report Conditons

WHITE YOUNG GREEN ENVIRONMENTAL

REPORT CONDITIONS

SUPPLEMENTARY ENVIRONMENTAL REPORT

DIVERSION OF THE B4333 AT ABERPORTH AIRFIELD

CEREDIGION COUNTY COUNCIL

This Supplementary Environmental Report is produced solely for the benefit of Ceredigion County Council and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

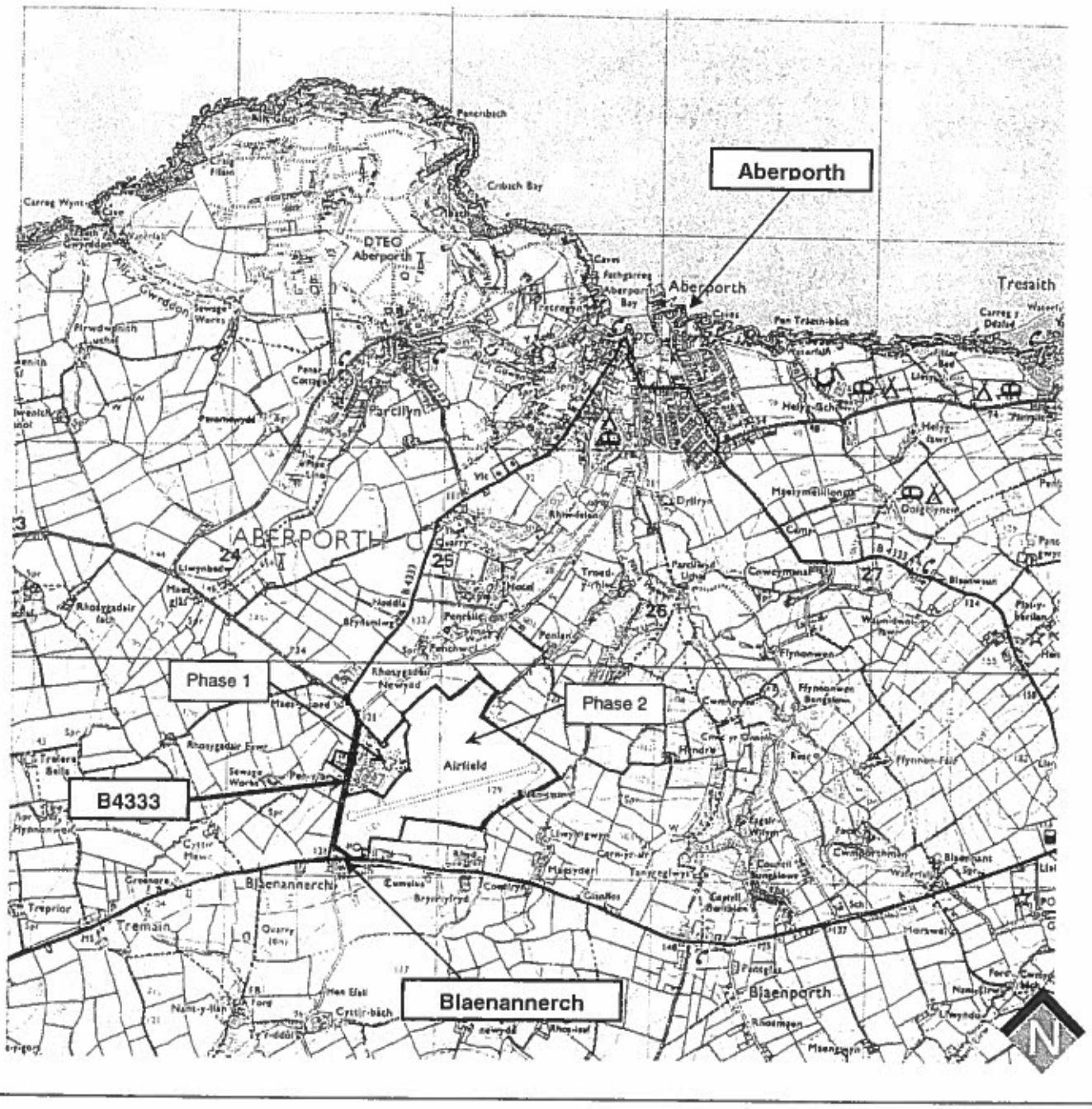
This Supplementary Environmental Report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site.

This Supplementary Environmental Report is based on a visual site inspection, reference to accessible referenced historical records, information supplied by those parties referenced in the text and discussions with local, statutory and non-statutory authorities. Some of the opinions are based on unconfirmed data and information and are presented as the best that can be obtained without further extensive research.

Whilst confident in the findings detailed within this report because there are no exact UK definitions of these matters, being subject to risk analysis, we are unable to give categorical assurances that they will be accepted by authorities or funds etc. without question as such bodies often have unpublished, more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYGE. In time improved practices or amended legislation may necessitate a re-assessment.

APPENDIX B

Figures



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CLIENT: Ceredigion County Council

PROJECT: Diversion of the B4333 at Aberporth Airfield

TITLE: Site Location

DATE: July 2004

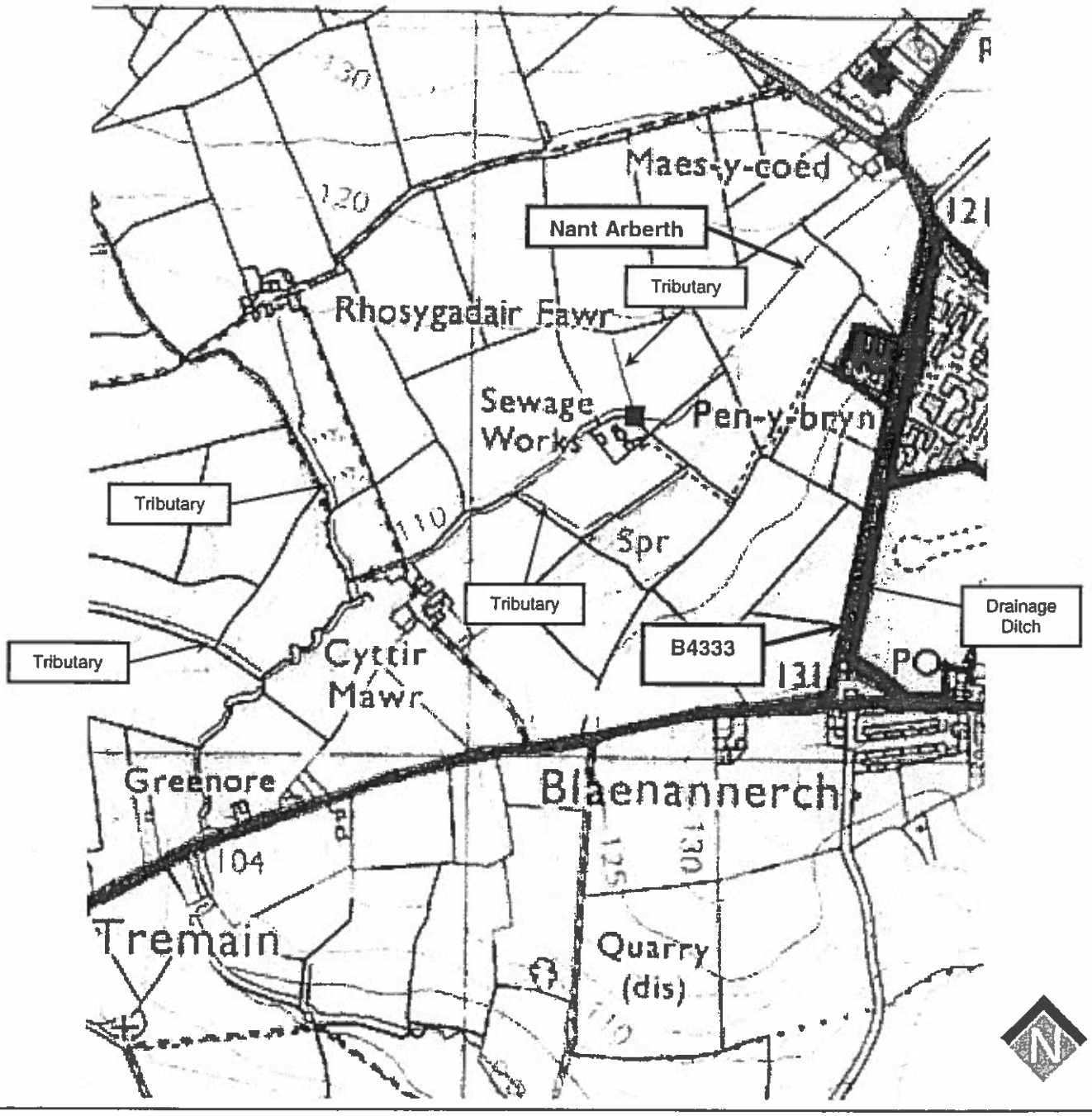
PROJECT NO: E4734

DRAWN: EL

CHECKED: PFS 29.07.04

APPROVED: M.C. 29.07.04

FIG NO: 01



KEY:

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CLIENT: Ceredigion County Council

PROJECT: Diversion of the B4333 at Aberporth Airfield

TITLE: Water Environment

DATE: July 2004

PROJECT NO: E4734

DRAWN: EL | CHECKED: 29.07.04 | APPROVED: 29.07.04

FIG NO: 04

APPENDIX C

Archaeological Assessment

CONTENTS

SUMMARY

Oxford Archaeology North (OA North) were invited by White Young Green Environmental Ltd to undertake an archaeological assessment of the second phase of development at Aberporth airfield (SN 255 495) as part of an Environmental Impact Assessment. The development is proposed to include a westward diversion to the B4333 in conjunction with the redevelopment of the main airfield site. The assessment involved a desk-based study of the location of archaeological sites to the west of the main airfield site; however a rapid walk-over survey of the site has yet to be completed.

The desk-based study involved an enhancement of the previous Phase One assessment report in light of further work (Cambria Archaeology 2004) and an investigation of pertinent documents held by the Dyfed Sites and Monuments Record, the National Library of Wales, and the National Monuments Record in Aberystwyth for the area included in Phase Two of the proposed redevelopment work.

The NMR and Dyfed SMR recorded a further three sites of archaeological interest, including the existence of a Bronze Age round cairn at the eastern edge of the study area, at Crug-gwyn, a cremation burial on the south-west edge of the assessment area at Tremaen and the standing buildings of Pen-y-bryn farm which has recently been added to the SMR.

The rest of the sites identified by the desk-based study consisted of post-medieval structures which included houses and farms at Crug-gwyn (Site 22), Cyttir Mawr (Site 31) and Pen-llas (Site 32), along with an un-named structure shown on the tithe map (Site 34), several quarries, a spring and the sewage works associated with the construction of the airfield.

The sites have been graded in terms of archaeological significance. The possible cairn (Site 25) and cremation burial have been graded as of regional importance, reflecting the potential prehistoric date and degraded condition. Similarly, the airfield perimeter defensive system (Sites 2-10), formed by pillboxes, is considered to be of regional importance, reflecting the integrated nature of the system and its relatively good survival.

It is recommended that an archaeological evaluation be undertaken at selected sites; however, the precise programme of evaluation will be subject to a walk-over survey yet to be undertaken. At the very least targeted evaluation trenching is recommended on the un-named rectangular structure (Site 34) and Penn-llas (Site 32); also evaluation trenching may be needed in the general vicinity of the grid references supplied for the round barrow (Site 25) and Cremation burial (Site 24), should the proposed development encroach into their areas.

ACKNOWLEDGEMENTS

Oxford Archaeology North would like to thank Emma Leacroft of White Young Green Environmental Consultancy for commissioning this phase of work. Thanks are also due to Lucy Bourne, Planning Archaeologist at Cambria Archaeology, and the staff at reader services of the Royal Commission on Ancient and Historical Monuments in Aberystwyth for additional information.

The desk-based assessment was undertaken and written by Peter Schofield using information provided in the previous assessment by Richard Newman; the drawings were produced by Peter Schofield and Jamie Quartermaine. The report was edited by Jamie Quartermaine and Alan Lupton, and the project was managed by Jamie Quartermaine.

1. INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Oxford Archaeology North (OA North) were invited by White Young Green Environmental Consultancy to undertake a second phase of archaeological assessment at Aberporth airfield, Ceredigion (centre SN 242 493) (Fig 1) in advance of a proposed re-routing of the B4333 to the west of the previous assessment area (LUAU 2000), as part of an Environmental Impact Assessment. It is proposed to develop the airfield for the Defence Evaluation and Research Agency (DERA).

1.1.2 Prior to the current phase of work, OA North under its' former guise as the Lancaster University Archaeology Unit (LUAU 2000) conducted an archaeological assessment within the boundary of the airfield itself (Fig 1), this consisted of a desk-based assessment and rapid walkover survey which informed an Environmental Impact Assessment for the specific site. The report identified the partially extant remains of a core complex of military buildings associated with the life of the airfield from the 1940's onwards, as well as the potential for prehistoric remains associated with putative Bronze Age barrow sites in the immediate vicinity.

1.1.3 In addition at the beginning of 2004, Cambria Archaeology were commissioned by the Welsh Development Agency (WDA) to conduct a desk-top survey and the recording of surviving buildings upon Aberporth Airfield in advance of site demolition and redevelopment.

1.1.4 The current archaeological assessment consists of an enhancement of the first phase of desk-based assessment of the airfield in response to the work conducted in the intervening period, and also focuses on a 1km wide corridor following the route of the proposed B4333 diversion to the west of the airfield. (Fig 4) where the proposed runway extension will take place. The proposed road development route will run from the roundabout that has been constructed to the north of Pen-y-bryn farm in a south-westerly direction, running within the fields to the south and east of the sewage works and down to a new roundabout to be constructed on the main A487 trunk road, to the south of Cyttir Mawr. The assessment consisted of an investigation of all cartographic and primary documentation pertinent to the immediate area surrounding the proposed development route held by the Dyfed Sites and Monuments Record at Cambria Archaeology, Carmarthern, and the Royal Commission on the Ancient and Historical Monument of Wales (RCAHMW) in Aberystwyth.

2. METHODOLOGY

2.1 DESK-BASED ASSESSMENT

2.1.1 Several sources of information were consulted, in accordance with the original project design. The study area consisted of a 1km wide corridor centred upon the line of the proposed diversion of the B4333 (Figs 3 and 4). The principle sources for the second phase of survey were the Dyfed Sites and Monuments Record (SMR), maps, and secondary sources; however, a number of other sources were also consulted as part of the original phase of work; all are presented here.

2.1.2 ***Royal Commission on the Ancient and Historic Monuments of Wales (RCAHMW)***: details of known and recorded archaeological resources in the immediate vicinity of the proposed development route were requested from RCAHMW Reader Services. Further consultation with RCAHMW revealed that they do hold the 1946 air photo coverage of the area; however, there was insufficient time to consult this source.

2.1.3 ***Sites and Monuments Record:*** details of the known and recorded archaeological resource in the immediate vicinity were requested from the Dyfed Sites and Monuments Record (SMR) in Carmarthen. Copies of the relevant section of the Aberporth tithe map and the Ordnance Survey (OS) 1st edition 6 inch to 1 mile map of the area, along with a copy of the Cambria Archaeology desk-based survey of the airfield, were forwarded by the SMR.

2.1.4 ***Oxford Archaeology North:*** OA North has an extensive archive of secondary sources relevant to the study area, specifically collected for the previous phase of development work. These were consulted where appropriate.

2.1.5 ***Public Record Office and Welsh National Assembly:*** internet-based searches revealed that the Public Record Office in Kew did not contain any records relevant to the Ministry of Defence's ownership of the site, though one set of documents, in the process of being transferred from the Welsh National Assembly to the Public Record Office (BD 54) and entitled '*Plans of airfields in Wales*', may contain some information. The present location of this document bundle could not be established by employees at the Welsh National Assembly and, consequently, the documents were not available for consultation. The Air Photographic Registry of the Welsh National Assembly was consulted by telephone and they informed OA North that no air photographic coverage of the area was held by them.

2.1.6 ***National Library of Wales and Ceredigion Archives:*** visits were made to the National Library of Wales and the Ceredigion Archives, both in Aberystwyth, to examine any relevant documents or maps. In the National Library of Wales the tithe apportionment was checked and an estate map dated 1810 for Plas Aberporth was examined (NLW Morgan Richardson Deposit No. 2), but the area lay to the north of that later used for the airfield. In the Ceredigion Archives no useful information was found other than that contained on OS maps. Air photographic coverage of Ceredigion, dated 1956, deliberately excluded Cardigan and Aberporth, presumably because of the military sensitivity of the area.

2.1.7 ***DERA:*** a meeting was held with representatives of DERA and access was granted to their maps and plans archive, allowing an assessment of the development of the site from 1940 to the present day.

2.1.8 ***Defence Estates:*** a subsequent visit was made to the offices of the Defence Estates at Brecon Barracks to examine the archives held there relating to the Defence Estates holdings at Aberporth. Little of relevance was found other than a 1:2500 map of the airfield area dated 1940.

2.1.9 ***Expert and local consultation*:** following the initial data-gathering exercise, telephone inquiries were made of the Aberporth History Society and of the Royal Commission for Ancient and Historical Monuments in Wales (RCAHMW), to gain further details about the history and development of the airfield.

2.2 FIELD SURVEY

2.2.1 ***Phase 1 Survey:*** a site visit was made and the entire airfield was walked. Notes were made on the location of a number of features and photographs were taken of features from outside the airfield. Access was not available for the area to the west of the B4333 road which will be impacted upoon by the runway extension and, consequently, this area was not examined at this stage. All features identified by the present survey were adjacent to modern field boundaries and were located with respect to these topographic features. No photography was allowed within the site itself for security reasons, though DERA agreed to supply photographs of extant buildings which were found to date in their origins to *c*1940.

2.2.2 ***Phase 2 Survey:*** at the present time (July 2004) a site visit to conduct a rapid walkover survey of the proposed development route on the west side of the current B4333 road was not possible due to ongoing access negotiations. It is envisaged that when access has been granted a site visit will at a later stage inform a revision of this present report.

2.3 GAZETTEER

2.3.1 The noted features of archaeological interest from the desk-based assessment are interpreted, graded for significance and the impact upon them by the proposed development proposals considered. Mitigation measures are recommended where appropriate. All features noted within the study area are given a site number and are summarily described within a site gazetteer (*Appendix 2*).

2.4 ARCHIVE

2.4.1 A full archive of the work has been produced to a professional standard in accordance with current English Heritage guidelines (1991) and the *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990).

3. PLANNING AND HISTORICAL BACKGROUND

3.1 PLANNING BACKGROUND

3.1.1 The study area does not contain any scheduled monuments or listed buildings. It does not form part of a conservation area, nor is it part of a Registered Park and Garden. Close by the study area is one grade II listed structure: a milestone at Blaenannerch, to the south of the airfield and 400m to the east of the B4333 (Cadw nd) (outside the study area).

3.1.2 Eight items of archaeological interest are noted on the Dyfed Sites and Monuments Record within the vicinity of the study area. In particular, the curatorial archaeological organisation, Cambria Archaeology, consider the airfield itself and a Polish resettlement camp, which occupied some of the Air Ministry buildings after the Second World War, to be of historic importance (White Young Green 2000).

3.2 HISTORICAL BACKGROUND

3.2.1 As with much of Ceredigion, the Aberporth area has good potential for the survival of prehistoric remains. Limited arable farming and low intensity land-use throughout much of the historical period has ensured a better than average chance for the survival of early remains. As well as cairns, there are numerous defended hilltop sites within the region, the nearest to the study area being about a kilometre away at Rhyd-y-gaer. However, there is little documented evidence for surviving prehistoric remains in the Aberporth vicinity. Evans' turn of the nineteenth century survey of the antiquities of Ceredigion does not mention Aberporth in connection with any known antiquities (Evans 1903).

3.2.2 No Roman remains are known of in the immediate vicinity of the study area. After the ending of Roman Britain, Ceredigion developed as a distinct sub-kingdom in the border region between the powerful kingdoms of Deheubarth and Gwynedd. Aberporth lay in the medieval commote of Iscoed, which was centred on Cardigan (Lloyd 1937).

3.2.3 By the early post-medieval period Aberporth was the principal herring port of Wales (Jenkins 1982, 112). By the eighteenth century it was developing wider commercial interests on the back of herring industry-associated imports, in particular salt which was brought from Ireland, France and the ports of Chester and Lancaster (*op cit*, 113). By the end of the eighteenth century the maritime trade of the south Cardiganshire ports was considerable, with Cardigan the largest port and much larger by volume of trade than Cardiff for example (*Op cit*, 114).

3.2.4 During the nineteenth century Aberporth continued to export salted fish, along with other primary products, including oak bark for tanning. Its imports included salt, timber, lime and in particular culm – anthracite dust used for fuel – which was unloaded on the beach (*op cit*, 118). Trade declined in the later nineteenth century as the south Cardiganshire ports were out-competed by those of south Wales. Nevertheless, Aberporth families played a role in the development of the

new trade with several figuring prominently in Cardiff-based shipping (*op cit*, 125-6).

3.2.5 The airfield was planned at the start of the Second World War. Vacant possession of the site was given to the Air Ministry on 29th September 1939 and the airfield opened in December 1940, although negotiations for the freehold were still ongoing in 1941. Following the Second World War much of the land to the south of Aberporth, requisitioned during the War, remained in government hands as military installations.

3.3 GEOLOGICAL BACKGROUND

3.3.1 The solid geology of the study area is formed of Llandeilo to Ashgill rocks, comprising Argillaceous rocks with subequal interbedded strata of sandstones (Institute of Geological Sciences 1970).

4. ASSESSMENT RESULTS

4.1 INTRODUCTION

4.1.1 These assessment results present the results of both the Phase 1 study which examined the area of the airfield, and the Phase 2 study which examine the extent the proposed route of the diverted B4333. The results for the two areas are here presented separately but are combined in the site gazetteer (*Appendix 2*) and the site mapping (Figs 3 and 4).

4.2 PHASE 1 ASSESSMENT – AIRFIELD DEVELOPMENT

4.2.1 ***Bronze Age Burials:*** PRN 5834 is the putative site of a cairn thought to have existed in the vicinity as the result of the house named Crug-gwyn, SN 2454 4942. The house is situated on the opposite side of the road to the airfield and was present and so named in 1887-8 (OS 1st edn 6 inch to 1 mile). The house was still present in 1948 (OS revised edn 6 inch to 1 mile) but had gone by 1976 (OS 1:2500, 1977). The place-name element 'crug' means a mound or cairn, with the element 'gwyn' possibly meaning white (Davies nd). The 'gwyn' element is very common in the area, however, and is used as a suffix at Gwndwn-gwyn, SN 2455 4980, to the south of Rhosygadair Newydd and known as Maes-y-coed by 1976, and at Llwyn-gwyn, SN 2550 4924 (Air Ministry 1: 2500, 1940; OS 1:2500, 1977).

4.2.2 A further property called Crug-gwyn was depicted on both the OS 1st and 2nd edition maps within Blaenannerch, to the south of the present A 487(T) at SN 2484 4905 (OS 1st edn 6 inch to 1 mile 1887-8; OS 2nd edn 1:2500, 1905); it was no longer in existence by 1976 (OS 1:2500, 1977). This property appears to have derived its name from the tumulus (Site 22) situated in the adjacent field at SN 2484 4905 (OS 1:2500, 1977). This association lends further credence to the other Crug-gwyn being associated with a cairn.

4.2.3 The cairns are likely to be of Bronze Age date and may be associated with the activity represented by a likely Bronze Age cremation urn found in the neighbouring parish of Tremain and now lost (PRN 5216). This urn is recorded on the OS record cards held by Cambria Archaeology as possibly being found at SN 235 487, within the settlement of Tremain (Eleanor Breen pers comm). Whilst urns are often associated with others in cemeteries, there is no reason to assume that a cremation burial at Tremain has any significance for the study area other than as a further signifier of the seeming density of later prehistoric burial activity in the vicinity.

4.2.4 There are other place-names within the area that might be taken to denote prehistoric burial activity. Two buildings are shown on the tithe map of 1839 close to and within that part of the airfield which extends to and abutts the A487 trunk road, at SN 2465 4909 and SN 2461 4910 (NLW Aberporth tithe map). The former appears to have occupied the property that later became Blaenannerch post office, and the latter had been removed by 1887 (OS 1st edn 6 inch to 1 mile 1887-8). These properties are recorded in the tithe apportionment as Pen-y-cnwc. The suffix is derived from 'cnwch' meaning a small mound and thus the place-

name is the hill of the small mound (Davies nd). A Pen-cnwc farm still existed in 1887 at SN 2494 5010, to the north of the airfield. It is unclear whether or not these two cottages derived their name from being part of the Pen-cnwc estate or whether their name was independent of it. There is no obvious immediately local topographical reason for these cottages to be so named in 1839, but the occurrence of the 'cnwc' place-name element within the study area is further possible evidence for the local occurrence of burial mounds.

4.2.5 ***The Pre-Airfield Landscape:*** the settlement pattern of Ceredigion which developed in the Middle Ages was one of dispersed farms surrounded by enclosed fields set within a landscape containing much open land used for common grazing (Parkinson 1985, 118). By the 1790s in south Cardiganshire most of the open fields had been enclosed (Davies 1979, 101), and a landscape created which was similar to that depicted on the Aberporth tithe map of 1839: highly enclosed with dispersed small settlements consisting of isolated farms and hamlets.

4.2.6 The hamlet of Blaenannerch, strung along what is now the modern A487 trunk road, may in the form depicted in 1839 have been of relatively recent origin, developing as part of the post-medieval rationalisation of the landscape. The missing cottage referred to as Pen-y-cnwc on the tithe map, and whose former location is within the airfield (Site 15), may have been of relatively recent origin in 1839 even though it had been abandoned by 1887. Labourer's cottages in eighteenth and early nineteenth century west Wales were often poorly-built and lacked durability, thus they tended to exist for perhaps a century at best (William 1995). Walter Davies, writing in 1810, refers to houses of the rural poor as having no more than one smoky hearth for a kitchen and a damp little cell for a bedroom (Parkinson 1985, 111). This may well have been the type of house shown on the 1839 tithe map and referred to as Pen-y-cnwc in the apportionment.

4.2.7 ***The Airfield:*** Aberporth airfield currently consists of a set of buildings in its north-west corner with similar structures across the B4333 within a small compound. A tarmaced runway runs east/west across the middle of the airfield with an emergency grass strip on a north-east to south-west diagonal on the northern side of the tarmac runway. The grass strip is marked by 'L'-shaped strips of concrete at each of its corners. The airfield occupies land under the ownership of several estates in 1939 and vacant possession was gained in that year by the Air Ministry. The freehold was purchased between 1939 and 1941 and the conveyance deeds are dated 1942 (information from the Defence Estates). The airfield opened for operations in 1940.

4.2.8 An OS map dated 1953, but surveyed in 1948, along with plans held by DERA and the Defence Estates, indicate that the majority of the buildings on the site were built originally in 1940-1. The site was little altered by 1976 (OS 1:2500, 1977) though, subsequently, several original structures have been demolished (LUAU 2000, Figs 3 and 4; Cambria Archaeology 2004, Figs 3 to 6). Amongst the Second World War structures surviving, although altered and adapted, are the southernmost Bellman hangar, Whittle, Newton (B25), Edison (B18) and Marconi (B26) accommodation blocks on the main site, and Hilary (B53), Drake (B52), Scott (B48), Bonnington (B51) and Cook (B50) accommodation blocks in the compound across the B4333, which was formerly used by the Royal Navy (information supplied by Amey Comax; DERA drawing C:\DWGS\2460-86)

4.2.9 In addition to these buildings, there is other Second World War fabric associated with the airfield, consisting of a perimeter defence system of pillboxes (Sites **2-10** and **17-20**). The pillboxes are marked on the OS 1:2500, 1977. Field inspection showed them to consist of two types, a smaller hexagonal concrete structure and a larger structure with five flat faces, three of which contained the gun ports, and a rounded protrusion at the rear. Consultation with Medwyn Parry of the RCAHMW, and a member of the 'Defence of Britain' project team, confirmed that the smaller pillboxes were of Type 27 and the larger, Type 24. The pillboxes were generally located at angular breaks along the perimeter circuit; they provide cover for each other and form an integrated defence system. This system comprises six Type 24 and three Type 27 pillboxes around the edge of the airfield and, in addition, outside the study area but forming part of the airfield defence system, are four Type 24 and one Type 27 pillboxes. All of the pillboxes within the study area are reasonably intact, although most are extensively vegetated. A mound initially believed to be a putative burial mound (LUAU 2000, Site **01**) turned out upon subsequent inspection to be a concrete implacement.

4.2.10 Outside the airfield are a number of pillboxes which form part of the airfield's defence system, including one which might be affected by ancillary works to the development proposals. Situated at SN 2452 4936 is a Type 24 pillbox (Site **21**), to the north of which marked on the 1976 1:2500 OS map is a small rectangular structure (Site **23**), which may be associated with the airfield and its defences. Neither structure was visited as no access had been granted to the fields to the west of the airfield.

4.2.11 Aberporth airfield seems to have been unusually well defended. The reason for this is that it formed part of a defensive stop line against coastal invasion consisting of other fortifications and now filled-in entrenchments (Medwyn Parry pers comm).

4.2.12 ***The Polish Resettlement Camp:*** PRN 30592 and PRN 30595 are listed within the Dyfed SMR as Polish resettlement camps. The camps are shown on an OS map dated 1953 but based on the 2nd edition survey of 1904 with the most recent additions dating to 1948. Little appears to be known about these camps and no documentation, other than the map, was found relating to them. Local inquiries, directed through the Aberporth History Society and the British Legion, unearthed a few details. Two camps existed, one using the Air Ministry structures on the airfield and the other lying to the south of the present A487 trunk road (OS ref SN 244 488). Both were post-Second World War camps set up for Polish refugees. The camps included women and children (John Edwards pers comm) and at least one girl from there attended the local school (pers comm Mary Bott). There is little local knowledge of Poles assimilating into the local community and it is believed that most were repatriated.

4.2.13 The camp on the airfield used the buildings formerly occupied by military personnel during the Second World War. The buildings consist primarily of barracks and were erected in 1940-1. Although present in 1948 it is not known when the camp was closed and the site reoccupied by the military, however, nationally most Poles had been repatriated by the early 1950s.

4.3 PHASE 2 ASSESSMENT - PROPOSED RE-ROUTING OF THE B4333

4.3.1 The second phase of the assessment examined the line of the proposed re-route of the B433, to the east of Aberporth Airfield. This revealed, in addition to the 23 sites of archaeological interest discovered in the first phase of archaeological assessment (LUAU 2000), an extra 11 sites of archaeological interest within the 1km wide assessment corridor for the road. Of these three were identified from the SMR/NMR and eight from cartographic sources. An outline of the results for the proposed road development is presented in Table 1 below and in Figs 3 and 4.

4.3.2 There were no Scheduled Ancient Monuments (SAM's) or Listed Buildings within the assessment area. Three of the sites lie directly in the footprint of the proposed road diversion so will be directly affected by the development (Sites 12, 33 and 34, Fig 4). It is assumed that any of the other sites discovered to the east of the proposed road development may be affected by the construction of any runway extension, although this impact is beyond the scope of this assessment report.

Period	No of Sites	Sites
Bronze Age	2	Cremation Burial (Site 24), Round Barrow (25)
Post-Medieval	5	Quarries (Sites 29 and 30), Farm Buildings/Houses (S 31, 32 and 34)
19th-20th Century	3	Farm Buildings/Houses (Site 26, 27), Sewage Works (S 28)
Unknown	1	Spring (Site 33)

Table 1: Sites within the immediate environs of the proposed development

4.3.3 ***National Monuments Record (NMR) and Sites and Monuments Record (SMR):*** a total of three additional sites of potential archaeological interest were identified within the present assessment area. Since the first phase of assessment (LUAU 2000) all buildings upon the airfield (including boundary pillboxes) have been assigned SMR numbers). The two main complexes of buildings making up the airfield, Sites 11 (SMR 30594) and 12 (SMR 30592) have been assigned additional SMR numbers for each building identified upon field inspection and through desk-top study (Cambria Archaeology 2004, SMR 50863 – 50918).

4.3.4 ***Bronze Age:*** the period was represented by the location of the Crug Gwyn putative round barrow (Site 25), said to have been possibly destroyed by the construction of the airfield. The site was initially thought to have been identified to the south at Site 01 (LUAU 2000), however on subsequent inspection this is now believed to be a concrete emplacement. No remains of the cairn, however, were identified at the site reported by the SMR (Site 25).

4.3.5 A further generalised location of a cremation burial is located to the west at Tremaen (Site 24). The village it has been named after is some distance to the west so caution regarding the exact grid reference of the site being within the present assessment area is required. The location of possible Bronze Age funerary monuments within the assessment area along with sites located to the, for example at Banc (Site 22) imply that further unknown sub-surface remains may survive within the general area.

4.3.6 ***Nineteenth to Twentieth Century:*** the numbering of buildings associated with the airfield by Cambria Archaeology (2004) discussed above has additionally

identified Pen-y-bryn farm (Site 26) as a site entered into the SMR (51109). It is described as a collection of red-bricked farm buildings, pre-dating the construction of Aberporth Airfield, but not by much.

4.3.7 ***Cartographic Sources:*** in addition to the SMR sites a number of sites and landscapes were identified from cartographic sources that date back to the tithe map of 1839.

4.3.8 ***Aberporth Tithe Map (1839):*** the tithe map shows the already rationalised nature of the enclosed landscape around the assessment area at this period, the land had probably not been enclosed for long as the settlement and enclosure process in the region has late origins (*Sections 4.2.5 and 4.2.6*). The hamlet of Blaenannerch has already a limited ribbon development extending along the A487 trunk road. One site of additional interest is shown on the map within the assessment area, which is a small rectangular structure (Site 34), sat within a small enclosure (245 on tithe apportionment), alongside a small trackway and located to the west of the current B4333. This was possibly an ancillary farm building like a barn, or possibly a small farm cottage.

4.3.9 ***Ordnance Survey 1st Edition (1891 - Fig 2):*** the field system noted in the previous map remained relatively static, the main additions to the map include the construction of Pen-y-bryn farm (Site 26) and Crug-gwyn house (Site 27) with small field enclosures on either side of the B4333, along with a small house named as Pen-llas (Site 32) located on the south side of the A487. The farmstead of Cyttir Mawr was named as 'Cydtir Mawr' on this map; it was probably older than this period and should be on the tithe map, however, the copy consulted did not quite reach the farm. On this map, however, the farm of Cyttir Mawr (Site 31) looks relatively well developed with a range of buildings and plantations of trees on the north and west sides. The small building identified on the tithe map (Site 34) was possibly marked as a blob on this map; however, the enclosure and associated trackway are not shown. Additional sites include two quarry sites (Sites 29 and 30), of which the latter is described as 'Old Quarry' and presumably was worked for some time before this map was produced. They seem to be small localised quarries, possibly for construction material for the field boundaries and farm houses.

4.3.10 ***Ordnance Survey 2nd Edition (1904 – Revised 1948):*** the most evident additions to this map are the sites of the airfield complexes, named as a 'Polish Resettlement Camp' (Sites 11 and 12) and a rectangular structure (Site 23). These are schematic in nature and, along with the new sewage works (Site 28), probably form much of the newly revised material for the map in 1948. An additional site, first seen on this map, was a small spring located to the east of Cyttir-Mawr (Site 33). The current assessment area again had a relatively static field distribution by contrast to the airfield site to the east, however, the quarries and small rectangular structure (Sites 19, 20 and 34) were no longer present. The houses at Pen-y-bryn (Site 26) and Crug-gwyn (Site 27) remained unchanged but the ancillary farm buildings at Cyttir Mawr (Site 31) had been altered and two outlying structures had been constructed on the south-east side of the site. The house of Pen-llas to the south of the assessment area had disappeared by this period leaving only its small enclosed fields

4.3.11 ***Air Ministry 1:2500 Map (1940):*** this is an annotated copy of the 2nd Edition OS map (originally 1904), before the construction of the airfield and the revision of 1948. It shows the eastern half the current assessment area, around the edges of the airfield before construction. The small rectangular structure first shown on the tithe map (Site **34**) had been demolished by this period. It is unknown if any of the other sites missing from the revised 2nd Edition (*Section 4.3.3*) were already demolished by this point as the majority of the assessment area was not covered.

4.3.12 ***Air Ministry Plan WA9/287/58 (1958):*** this is a Foul and Stormwater Drainage plan of the main airfield complex (Sites **11** and **12**). An inset plan however shows the site of the sewage works compound ('Sewage Disposal Works') to the west of the airfield (Site **28**) and also that Pen-y-bryn and Crug-gwyn are still in existence (Sites **26** and **27**).

4.3.13 ***Ordnance Survey 1:2500 Map (1977):*** the nature of the field distribution and farm structures has changed little when compared to previous cartographic sources, with only a few field boundaries being 'grubbed out'. The major differences with the previous Ordnance Survey map is that the airfield building complexes are shown in full (Sites **11** and **12**), along with the position of the surviving pillboxes on the airfield boundary. The site of Crug-gwyn house (Site **27**) has been cleared in the period between the Air Ministry Plan (1958) and this map.

5. SIGNIFICANCE AND IMPACT

5.1 SCHEDULE OF SIGNIFICANCE

5.1.1 The sites are graded 1-4. Grade 1 sites are of national importance and include those that would merit being scheduled and or listed grade I or II*; such sites should always be preserved wherever possible. Grade 2 sites are of regional importance and should be preserved for preference, but if this proves difficult within a development scheme they should be fully recorded. Grade 3 sites are of local importance and again preferably should be preserved, but where this would be inconvenient appropriate measures should be taken to ensure they are adequately recorded before removal. Grade 4 sites are of little or no importance and no further investigation beyond that undertaken to complete this report is deemed necessary.

5.1.2 No sites within the study area are considered to merit a grading of 1. The cremation burial (Site **24**) and possible round barrow (Site **25**), would merit this status if they were known to survive; however, their positions and condition are uncertain.

5.1.3 The airfield perimeter defensive system formed by the pillboxes (Sites **01-10** and **21**) also merits a grading of 2, though individually each pillbox can only be considered to be of local significance. Together, however, they form an integrated system which is quite unusual and should be retained in its current form.

5.1.4 The airfield building complex (Site **11**) consists of a series of structures erected *c*1940; though adapted, modernised and altered, many of these structures are recognisably Second World War military buildings. Whilst such buildings are quite commonplace, and built to a standard pattern, their significance is emphasised by their later use as a Polish resettlement camp. The building group is thus of local significance and graded 3. Similarly, the compound of buildings on the other side of the B4333 (Site **12**) is graded 3.

5.1.5 The site of the un-named building (Site **34**) within enclosure 245 marked on the tithe map, along with Pen-llas house (Site **32**) and Crug-gwyn house from the 1st Edition map, for which there are no surviving surface evidence, are also considered to be of local significance and thus graded as 3.

5.1.6 The sewage works (Site **28**) and other rectangular ancillary airfield structure (Site **23**), along with the spring (Site **33**) and quarries (Sites **29** and **30**) which are of post-medieval or modern origin, are all graded 4.

5.2 IMPACT OF THE AIRFIELD DEVELOPMENT

5.2.1 The development was to be undertaken in two phases (1 and 2); the first phase involved the redevelopment of the airfield buildings in the north-west part of the site, and Phase will 2 encompasses the rest of the airfield, but will affect mostly the northern part of the airfield. The first phase of development work has had a direct adverse impacts on the archaeological resource, removing all the buildings associated with the 1940s airfield and the Polish resettlement camp (Sites **11** and

12), but this has been mitigated by the building survey (Cambria Archaeology 2004) and no further work on theis site is envisaged.

5.2.2 The removal of the structures at Site 12 (Phase 1) could be avoided since it is only proposed to turn this area into tennis courts. However, the structures at Site 12 are already derelict and unsafe and without reuse will in any case collapse.

5.2.3 An additional impact would include an effect on the site named as Pen-y-cnwc in 1839 (Phase 2), if the proposal to develop the area of its site for residential land was carried out.

5.2.4 The pillboxes forming the perimeter defence system to the airfield are unlikely to be affected by the development proposals. It should be possible to avoid any impact on them other than the visual masking which will be caused by the development.

5.3 IMPACT OF THE RE-ROUTING OF THE B4333 ROAD

5.3.1 The re-routing of the B4333 will directly affect two sites identified by the archaeological assessment that lie within the footprint of the proposed road corridor. The impacted sites are the spring (Site 33), located at the junction of field boundaries to the south of the sewage works, and the un-named rectangular structure (Site 34), located an equal distance between the sewage works and Pen-y-bryn farm. The roundabout constructed to the north of the development has encroached onto the now demolished remains of the airfield complex, with the western complex (Site 12) being crossed by the footprint of the road.

5.3.2 The footprint of an ancillary farm track on the west side of Pen-y-bryn farm may encroach onto the area around the rectangular airfield structure (Site 23), although the present state of preservation of this site has not been ascertained. Likewise the construction of the roundabout on the southern extent of the development route may impact upon the site of Pen-llas house (Site 32)

5.3.4 The construction of the road and any other ancillary structures and compounds not already shown as part of the proposed development route may have additional direct impacts upon any of the sites within the current assessment area (Fig 4). It is expected that these impacts and suggestions for additional mitigative measures would be recorded in a further version of this report.

5.3.5 Any extension to the western end of the runway will have a direct impact upon at least a possible further six sites (Sites 01, 13, 21, 25, 27, and 29) and a revised version of this report and mitigative measures will be necessary.

6. MITIGATION

6.1 INTRODUCTION

6.1.1 The present report is an interim statement awaiting the availability of access to undertake a walk-over survey in the area of the proposed re-route of the B4333. The results of this survey may have a significant impact, both on the desk-based results and correspondingly, the recommendations put forward. Until then presented below are provisional recommendations for further investigation and mitigation of the archaeological resource.

6.2 AIRFIELD RECOMMENDATIONS

6.2.1 ***Sites 11, 12 and 23:*** the buildings of Sites 11 and 12 have been subject to mitigative recording (Cambria Archaeology 2004). No further work need be conducted upon the remains of these two main airfield complexes (Sites **11** and **12**) even though the footprint of the proposed road development crosses the latter. Additionally, the rectangular airfield structure (Site **23**) needs to be assessed within the rapid walkover survey of the site which is to be completed at a later date.

6.2.2 Those pillboxes and concrete emplacements (eg Site **01**), which will be masked by the development or destroyed by the runway extension, should be photographed in their current setting to provide a record of their original context. Attention should also be given to identifying properly the nature of the probable concrete emplacement (Site **01**) which was initially thought to be the site of the round barrow (Site **25**)

6.3 ROAD RE-ROUTING RECOMMENDATIONS

6.3.1 ***Sites 32, 33, and 34:*** the site of the un-named rectangular structure (Site **34**) and the spring (Site **33**) lie within the footprint of the proposed development. The rapid identification survey will inform on any above-ground remains on these sites, and it is envisaged that the rectangular structure may need targeted exploratory archaeological evaluation trenching. Targeted evaluation trenching may also be required on the site of Pen-llas house (Site **32**) if it comes within the footprint of the southern roundabout on the A487 trunk road.

6.3.2 ***Sites 24 and 25:*** the general areas around the grid references provided for the cremation burial (Site **24**) and the round barrow (Site **25**) should be targeted with evaluation trenches within the areas of the proposed development route and any runway extension as these sites may yield sub-surface remains.

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DERA C:\DWGS\2460-86

White Young Green Environmental Phase 2 Development of Aberporth Airfield EIA Scoping Study Issue 1 September 00

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http://www.zem.co.uk/polinuk/fed

APPENDIX 1
PROJECT DESIGN

OCTOBER 2000

ABERPORTH AIRFIELD

CARDIGAN

CEREDIGION

ARCHAEOLOGICAL ASSESSMENT

Proposals

The following project design is offered in response to a request from White Young Green Environment, for an archaeological assessment of Aberporth Airfield, near Cardigan in advance of the development of the airfield for commercial, industrial and office premises.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF PROJECT

1.1.1 Lancaster University Archaeological Unit (LUAU) have been requested by White Young Green Environment to submit a project proposal for an archaeological assessment of Aberporth Airfield to be undertaken in advance of the development of the site for commercial, light industrial and office premises. There are two proposed phases of development, the first involves the redevelopment of the existing airfield buildings in the north-western part of the site, and will entail the demolition of some of the present buildings. The second phase incorporates the airfield itself and in addition to the construction of further light industrial premises will involve the construction of a combined heat and power scheme; it may also entail the extension of the runway to the west. The requirement for the assessment is for a basic level of survey to identify the extant and documented archaeological resource.

1.2 BACKGROUND

1.2.1 The airfield was built at the outset of the Second World War, and became operational in December 1940 as an Anti-Aircraft support base for gunnery ranges in Cardigan Bay; in the later stages of the war it was used for training. Following the war the airfield buildings (Phase 1) were used as a Polish Resettlement Camp and in 1956 the present runway was constructed. The site is currently operated by the Defence Evaluation and Research Agency (DERA) which tests aircraft and surface weapons.

1.2.2 The Sites and Monuments Record (SMR) has identified four sites either within or in the environs of the study area, comprising the Polish Resettlement Camp (PRN 30592), the airfield itself (PRN 30594), a Bronze Age round barrow (PRN 5834) which is at the western end of the main runway, and a Bronze Age cremation cemetery (PRN 05216), its precise location being unknown. The presence of the round barrow and the cremation cemetery demonstrate significant activity during the Bronze Age and could be an indication that there are other contemporary sites in the environs. As a consequence there is a need to undertake the proposed archaeological programme to provide a reliable indication of the extant resource.

1.3 LANCASTER UNIVERSITY ARCHAEOLOGICAL UNIT (LUAU)

1.3.1 LUAU has considerable experience of the assessment of sites of all periods, having undertaken a great number of small and large scale projects during the past 18 years. Assessments and evaluations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables. LUAU has considerable experience of this type of study and has undertaken detailed assessment surveys of similar sites throughout Britain including an assessment and landscape impact study at Montgomery in Powys to inform a public enquiry.

1.3.2 Projects have been undertaken to fulfil the different requirements of various clients and planning authorities, and to very rigorous timetables. LUAU has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. LUAU is a registered organisation (No 27) with the Institute of Field Archaeologists' (IFA).

2. OBJECTIVES

2.1 The following programme has been designed in accordance with a verbal brief from Cambria Archaeology to provide an archaeological assessment of the designated area. The principal purpose of the assessment is to collate existing information about the archaeology of the site, to determine the significance of the identified archaeological resource, and to provide recommendations for any further archaeological investigation. The required stages to achieve these ends are as follows:

2.2 ***Desk Top Survey:*** to accrue an organised body of data to inform the identification survey.

2.3 ***Identification Survey:*** to record the character of the surface archaeology within the study area and provide an assessment of the archaeological significance of any remains.

2.4 ***Assessment Report:*** a written assessment report will be generated for the site, which will assess the significance of the data generated by this programme within a local and regional context. This will advise on the requirements for further recording measures as necessary.

3. METHODS STATEMENT

3.1 The following work programme is submitted in line with the stages and objectives of the archaeological work summarised above.

3.2 HISTORIC AND ARCHAEOLOGICAL DESK-TOP STUDY

3.2.1 This will entail the preparation of an assessment report to place the study area in its historical, archaeological and topographical context, and to assess the historic and archaeological significance of the site.

3.2.2 ***Documentary and Cartographic Material:*** The documentary research will involve the examination of written, cartographic, and pictorial sources; it will primarily examine records held by the Record Office: Cardiganshire Archives, Marine Terrace, Aberystwyth, SY23 2DE (01970 633697), but will also investigate sources such as the Dyfed Sites and Monuments Record at Cambria Archaeology, Llandeilo, the National Library of Wales, Aberystwyth and the RCAHM(Wales) Aberystwyth. This work will address the full range of potential sources of information and will examine early histories, early maps, and such primary documentation (tithe and estate plans etc.) as may be reasonably available. Any photographic material lodged in either the County Sites and Monuments Record or the County Record Offices will also be studied. Published documentary sources will also be examined and assessed. The study will undertake a search for Second World War records held by the Ministry of Defence and the Welsh Office, Cardiff. A series of documents (BD54) presently held by the Welsh Office, but shortly to be transferred to the Public Record Office, comprise plans of the airfield compiled during the Second World War. If copies of these or similar plans can not be obtained via the client then there will be a requirement to visit the Welsh Office, assuming that access to these documents will be allowed.

3.2.3 A scan of published sources is also proposed, to provide a context and chronology for the development of the site. Local societies, local libraries and local museums will also be consulted.

3.2.4 ***Aerial Photography:*** a survey of the extant air photographic cover will be undertaken; this may indicate the range and survival of archaeological and structural features in the designated area. Identified features will be accurately plotted at 1:10,000. This will examine sources of information held by the client, the local planning authority, and Dyfed County Council. Aerial photographic work will entail liaison with the Royal Commission on the Historical Monuments (Wales), Aberystwyth.

3.3 IDENTIFICATION SURVEY

3.3.1 *Access:* liaison for basic site access will be undertaken through White Young Green Environmental.

3.3.2 It is proposed to undertake an LUAU 'level 1' survey (*Appendix 1*) of the airfield (Phase 1 and Phase 2 areas). This is a rapid survey undertaken alongside a desk-top study as part of a site assessment. It is an initial site inspection intended to identify the extant archaeological resource. It represents the minimum standard of record and is appropriate to exploratory survey aimed at the discovery of previously unrecorded sites. Its aim is to record the existence, location and extent of any such site. The emphasis for the recording is on the written description which will record type and period and would not normally exceed *c*50 words. The extent of a site is defined for sites or features greater than 50m in size and smaller sites are shown with a cross.

3.3.3 The reconnaissance will be undertaken in a systematic fashion, walking on approximately 30m wide transects, within the extent of the defined study area. It is proposed to use a combination of Global Positioning System (GPS) techniques and manual survey techniques to locate and record the features. GPS instrumentation uses electronic distance measurement along radio frequencies to satellites to enable a positional fix in latitude and longitude which can be converted mathematically to Ordnance Survey National Grid. The use of GPS techniques has proved to be an essential and extremely cost effective means of locating monuments, and can achieve accuracies of better than +- 1m.

3.3.4 A photographic record will be undertaken simultaneously. An early surface inspection such as this is highly recommended, as such work can frequently double the amount of archaeological information for an area. This fieldwork will result in the production of plans at a scale of 1: 2500 or any other appropriate scale required, recording the location of each of the sites listed in the gazetteer. All archaeological information collected in the course of field inspection will be recorded in standardised form, and will include accurate national grid references. This will form the basis of a gazetteer, to be submitted as part of the report.

3.3.5 LUAU provides a Health and Safety Statement for all projects and maintains a Unit Safety policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (1997) and risk assessments are now being implemented for all projects.

3.4 ASSESSMENT REPORT

3.4.1 *Archive:* the results of Stages 3.2-3.3 will form the basis of a full archive to professional standards, in accordance with current English Heritage guidelines (*The Management of Archaeological Projects, 2nd edition, 1991*). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. It will include summary processing and analysis of any features and finds recovered during fieldwork. The deposition of a properly ordered and indexed project archive in an appropriate repository is considered an essential and integral element of all archaeological projects by the IFA in that organisation's code of conduct.

3.4.2 This archive can be provided in the English Heritage Central Archaeology Service format, both as a printed document and on computer disks as ASCii files (as appropriate), and a synthesis (in the form of the index to the archive and the report) will be deposited with the Dyfed Sites and Monuments Record, as appropriate. LUAU practice is to deposit the original record archive of projects (paper, magnetic, and plastic media) with the appropriate County Record Office, and a full copy of the record archive, should any material be recovered, with the material archive (artefacts, ecofacts, and samples, at this stage from surface collections) with an appropriate museum.

3.4.3 ***Collation of data:*** the data generated by 3.2 and 3.3 (above) will be collated and analysed in order to provide an assessment of the nature and significance of the known surface and subsurface remains within the designated area. It will also serve as a guide to the archaeological potential of the area to be investigated, and the basis for the formulation of any detailed field programme and associated sampling strategy, should these be required in the future.

3.4.4 ***Assessment Report:*** one bound and one unbound copy of the report will be submitted to the Client, and a further copy submitted to the Dyfed Sites and Monuments Record Office. The report will include a copy of this project design, and indications of any agreed departure from that design. It will present, summarise, and interpret the results of the programme detailed above and will include a full index of archaeological features identified in the course of the project, together with appropriate illustrations, including maps and gazetteers of known or suspected sites identified within or immediately adjacent to the study area. It will also include a complete bibliography of sources from which the data has been derived, and a list of further sources identified during the programme of work, but not examined in detail. The report will also include a complete bibliography of sources from which data has been derived, and a list of further sources identified during the programme of work, but not examined in detail.

3.4.5 The report will identify areas of defined archaeology, an assessment and statement of the actual and potential archaeological significance of any features within the broader context of regional and national archaeological priorities will be made. Illustrative material will include a location map, which can be tailored to the specific requests of the client (eg particular scales etc.), subject to discussion. The report will be in the same basic format as this project design; a copy of the report can be provided on 3.5" disk (IBM compatible format).

3.4.6 ***Confidentiality:*** the assessment report is designed as a document for the specific use of the client, for the particular purpose as defined in the project brief and this project design, and should be treated as such; they are not suitable for publication as an academic report, or otherwise, without amendment or revision. Any requirement to revise or reorder the material for submission or presentation to third parties beyond the project brief and project design, or for any other explicit purpose, can be fulfilled, but will require separate discussion and funding.

4. WORK TIMETABLE

The phases of work will comprise:

4.1 ***Desk Top Study***

A four day period is required to collate all the available data.

4.2 ***Identification Survey***

A one day period is required for the identification survey.

4.3 ***Prepare Assessment Report***

A three day period would be required to complete this element.

4.4 LUAU can execute projects at very short notice once an agreement has been signed with the client. The project is programmed to start on the 9th of October 2000 subject to being provided with four working days notice.

4.5 ***Staffing:*** the project will be under the management of **Jamie Quartermaine, BA, Surv Dip, MIFA** (Unit Project Manager) to whom all correspondence should be addressed. The assessment will be undertaken by **Richard Newman, PhD, BA, FSA. MIFA** (Unit Director) who is a landscape historian of considerable experience, and was formerly project officer at Glamorgan and Gwent Archaeological Trust; he has considerable familiarity with the archaeology of South Wales.

APPENDIX 2
GAZETTEER

Site Number	1
Site Name	Crug-gwyn, concrete emplacement
PRN	-
NGR	SN 2452 4923
Designation	-
Site Type	Concrete emplacement
Period	1940s
Source	Field Visit LUAU, Field Visit OAN
Description	Initially proposed to be the location of the site of the putative Crug-gwyn Round Barrow (LUAU 2000), on later inspection discovered to be the foundation base of a concrete emplacement, measuring approximately 6m in diameter, by 0.75m high. It is not shown on any OS maps of the area or the Air ministry plan (WA9/288/58), although the latter does not show any of the pillboxes in the area.

Site Number	2
Site Name	Aberporth airfield
PRN	50919
NPRN	270390
NGR	SN 2459 4918
Designation	-
Site Type	Pillbox
Period	1940s
Source	OS
Description	Type 27 pillbox. (SMR), Type FW3/22 Pillbox (NMR). Not visited in the field as behind hedgeline, mainly outside of the airfield.

Site Number	3
PRN	Aberporth airfield
Site Name	50920
NGR	SN 2521 4922
Designation	-
Site Type	Pillbox
Period	1940s
Source	OS/Field visit LUAU
Description	Type 24 pillbox.

Site Number	4
Site Name	Aberporth airfield
PRN	50921
NGR	SN 2528 4932
Designation	-
Site Type	Pillbox
Period	1940s
Source	OS/Field visit LUAU
Description	Type 27 pillbox.

Site Number	5
Site Name	Aberporth airfield
PRN	50922

NGR	SN 2537 4937
Designation	-
Site Type	Pillbox
Period	1940s
Source	OS/Field visit LUAU
Description	Type 24 pillbox.

Site Number	6
Site Name	Aberporth airfield
PRN	50923
NGR	SN 2538 4963
Designation	-
Site Type	Pillbox
Period	1940s
Source	OS/Field visit LUAU
Description	Type 24 pillbox. More ruinous than the others.

Site Number	7
Site Name	Aberporth airfield
PRN	50924
NGR	SN 2519 4976
Designation	-
Site Type	Pillbox
Period	1940s
Source	OS/Field visit LUAU
Description	Type 27 pillbox.

Site Number	8
Site Name	Aberporth airfield
PRN	50925
NGR	SN 2527 4987
Designation	-
Site Type	Pillbox
Period	1940s
Source	OS/Field visit LUAU
Description	Type 24 pillbox.

Site Number	9
Site Name	Aberporth airfield
PRN	50926
NGR	SN 2497 4991
Designation	-
Site Type	Pillbox
Period	1940s
Source	OS/Field visit LUAU
Description	Type 24 pillbox.

Site Number	10
Site Name	Aberporth airfield
PRN	50927
NGR	SN 2483 4977
Designation	-
Site Type	Pillbox

Period	1940s
Source	OS/Field visit LUAU
Description	Type 24 pillbox.

Site Number	11
Site Name	Aberporth airfield
PRN	Part of 30594 and 30592
NPRN	270846
NGR	SN 2470 4950 centred
Designation	-
Site Type	Military airfield buildings
Period	1940
Source	SMR/OS/Defence Estates, Field Visit Cambria Archaeology 2004
Description	Consists of barracks, guardroom, bellman hanger and other structures originating in 1940. The complex was used as a Polish resettlement camp immediately after World War II. Still in use. Group number of buildings surveyed in detail by Cambria Archaeology, 2004

Site Number	12
Site Name	Former Naval compound
PRN	30592
NGR	SN 2456 4955
Designation	-
Site Type	Military buildings
Period	1940s
Source	OS, Field visit LUAU, 2000, Field Visit Cambria Archaeology 2004
Description	A series of barracks. Now derelict having formerly been occupied by the Royal Navy and thus distinct from the main site which was RAF. It is not known whether this compound formed part of the Polish resettlement camp but it probably did. Group number of buildings surveyed in detail by Cambria Archaeology, 2004

Site Number	13
Site Name	Aberporth airfield
PRN	50928
NGR	SN 2455 4915
Designation	-
Site Type	Former building
Period	1940s
Source	OS/Field visit LUAU
Description	Concrete base to building standing in 1948.

Site Number	14
Site Name	Aberporth airfield
PRN	50929
NGR	SN 2465 4915
Designation	-
Site Type	Former building
Period	1940s
Source	OS/Field visit LUAU
Description	Concrete base to building standing in 1948.

Site Number	**15**
Site Name	Pen y cnwc
PRN	-
NGR	SN 2463 4910
Designation	-
Site Type	Site of building
Period	Pre-1839
Source	Tithe map
Description	House site. Building present in 1839 gone by 1887. No evidence on the ground.

Site Number	**16**
Site Name	Aberporth airfield
PRN	Part of 30594
NGR	50930
Designation	-
Site Type	unidentified
Period	post-1939?
Source	Field visit LUAU
Description	A low mound, about 3m diameter, with mortared bricks showing through the turf. Its location on the airfield perimeter suggests that it is derived from a structure associated with the airfield.

Site Number	**17**
Site Name	Aberporth airfield
PRN	50931
NGR	SN 2499 4916
Designation	-
Site Type	Pillbox
Period	1940s
Source	OS
Description	Type 24 pillbox.

Site Number	**18**
Site Name	Aberporth airfield
PRN	50932
NGR	SN 2560 4959
Designation	-
Site Type	Pillbox
Period	1940s
Source	OS
Description	Type 24 pillbox.

Site Number	**19**
Site Name	Aberporth airfield
PRN	50933
NGR	SN 2462 4978
Designation	-
Site Type	Pillbox
Period	1940s
Source	OS
Description	Type 24 pillbox.

Site Number	20
Site Name	Aberporth airfield
PRN	50934
NGR	SN 2444 4973
Designation	-
Site Type	Pillbox
Period	1940s
Source	OS
Description	Type 24 pillbox.

Site Number	21
Site Name	Aberporth airfield
PRN	50935
NGR	SN 2451 4935
Designation	-
Site Type	Pillbox
Period	1940s
Source	OS
Description	Type 24 pillbox.

Site Number	22
Site Name	Banc
PRN	8065
NPRN	304126
NGR	SN 2484 4905
Designation	-
Site Type	House
Period	Post-medieval
Source	SMR, NMR, OS
Description	A property called Crug-gwyn is depicted on the OS 1st and 2nd edition maps, which was located to the north-west of a tumulus shown on the modern OS 1:2500 map just to the south of Penybanc. The cairn is outside the study area and was not visited during the present survey.

Site Number	23
Site Name	Aberporth airfield
PRN	50936
NGR	SN 2450 4940
Designation	-
Site Type	Rectangular Structure
Period	1940s
Source	OS
Description	OS map is a small rectangular structure. It is outside the study area and was not visited during the present survey.

Site Number	24
Site Name	Tremaen
PRN	5216
NGR	SN 24 49
Designation	-
Site Type	Cremation Burial
Period	Bronze Age
Source	SMR

Description	Entry in SMR, no text given, probably general location of burial, possibly dug out of Crug-Gwyn Barrow (Site 25) or Banc Barrow (Site 22)?

Site Number	25
Site Name	Crug-gwyn
PRN	5834
NGR	SN 2456 4934
Designation	-
Site Type	Round Barrow
Period	Bronze Age
Source	SMR, LUAU 2000 - Site 01, Field Visit OAN 2004
Description	The possible location of a round barrow, which was said to have been demolished during the construction of the airfield. The previous archaeological assessment (LUAU 2000) placed the cairn further to the south (Site 01), however field survey revealed this to be a concrete emplacement.

Site Number	26
Site Name	Pen-y-bryn
PRN	51109
NGR	SN 24701 49579
Designation	-
Site Type	Farm Buildings
Period	Nineteenth to Twentieth Century
Source	SMR, OS 1st and 2nd Edn, Current OS, Air Ministry 1940 and 1958 Field Visit Cambria Archaeology 2004
Description	A collection of mostly red brick farm buildings, pre-dating the construction of Aberporth Airfield, but possibly not by much. Despite being largely surrounded by airfield buildings, the farmstead does not appear to have been incorporated into the airfield complex (Cambria 2004). The site is shown named from the 1st Edition OS onwards, but not shown on the tithe map.

Site Number	27
Site Name	Crug-gwyn
PRN	-
NGR	SN 24534 49340
Designation	-
Site Type	Building
Period	19th-20th Century
Source	OS 1st and 2nd Edn, Air Ministry 1940 and 1958
Description	A Single rectangular roofed building named as 'Crug-gwyn', from the 1st Edition OS onwards, it is not shown earlier on the tithe map or later than the Air Ministry map of 1958.

Site Number	28
Site Name	Aberporth airfield
PRN	-
NGR	SN
Designation	-
Site Type	Sewage Works
Period	1940's
Source	OS 2nd Edition and Current OS, Air Ministry 1958
Description	An extant sewage works to the west of the airfield and which was probably built specifically for airfield. It is shown on the revised 2nd Edition OS. The pre-airport Air Ministry Plan (1940) just misses this out, the other Air Ministry plan (1958) of Foul and

Stormwater Drainage, shows the works within an inset as a 'Sewage Disposal Works' linked directly to the airport.

Site Number	29
Site Name	Cyttir Mawr, Quarry
PRN	-
NGR	SN 24320 49165
Designation	-
Site Type	Quarry
Period	Post-Medieval
Source	OS 1st Edition
Description	A 'Quarry' shown on the 1st Edition OS in fields to the east of Cyttir Mawr, but it is not shown any later than that.

Site Number	30
Site Name	Cyttir Mawr, Old Quarry
PRN	-
NGR	SN 22398 49411
Designation	-
Site Type	Quarry
Period	Post-Medieval
Source	OS 1st Edition
Description	An 'Old Quarry' shown on the 1st Edition OS in fields to the north of Cyttir Mawr, but was not shown any later than that.

Site Number	31
Site Name	Cyttir Mawr
PRN	-
NGR	SN 23952 49215
Designation	-
Site Type	Farm Buildings
Period	Post-Medieval
Source	OS 1st Edition, 2nd Edition and Current OS
Description	Multiple farm buildings are shown on the mapping for this site, shown as 'Cydtir Mawr from 1st Edition OS, then as 'Cyttir Mawr'.

Site Number	32
Site Name	Pen-lean
PRONE	-
NGK	SN 24071 48995
Designation	-
Site Type	Building
Period	Post-Medieval
Source	OS 1st Edition
Description	A single rectangular roofed building named 'Pen-lean' and shown on the 1st Edition OS to the south of the trackway running south from Cyttir Mawr. It was demolished before the 2nd Edition OS.

Site Number	33
Site Name	Cyttir Mawr, Spring
PRN	-
NGR	SN 24167 49296
Designation	-

Site Type	Spring
Period	Unknown
Source	OS 2nd Edition, Current OS
Description	A 'spring' located to the east of Cyttir Mawr; it was first shown on the 2nd Edtion OS map

Site Number	34
Site Name	Cyttir Mawr
PRN	-
NGR	SN 24401 49428
Designation	-
Site Type	Building
Period	Post-Medieval?
Source	Tithe Map
Description	A small rectangular building within an enclosure, shown on the tithe map and located to the east of Cyttir Mawr. The enclosure is numbered 245 on the apportionment. The building had been demolished by the time of the 1st Edition OS map.

APPENDIX D

Landscape Assessment Tables

Table 1: Effects on Landscape Features

Description	Comment	Magnitude of Impact	Significance of Impact
Hedgerows	In order to accommodate the diverted road at least 6 hedgerows will have sections removed.	Moderate	Moderate adverse (-2)
Fields	The diverted road cuts across approximately 7 individual fields, creating spaces that may be un-usable to farmers.	Moderate	Moderate adverse (-2)
Cyttir Mawr	Proposed new access road to property from diverted road. Property will remain unaffected, except for disruption to access during construction.	Moderate	Minor adverse (-1)
Footpath F6 between Cyttir Mawr and Rhosygadair Fawr	Southern section of the footpath to be diverted to accommodate new access route into Cyttir Mawr.	Moderate	Minor adverse (-1)
Farm buildings	New access route into farm. Farm buildings will remain unaffected except for disruption to access during construction.	Slight	Minor adverse (-1)
Sewage treatment works	New access route to be constructed. Sewage treatment works will remain unaffected except for disruption to access during construction.	Slight	Minor adverse (-1)

Table 2: Effects on Landscape Character

Landscape Character	Comment	Magnitude of Impact	Significance of Impact
Agricultural and grazing farmland with a dense field pattern divided by hedgerows and woodlands. Small farms and isolated buildings throughout the landscape.	The diversion of the road will only affect the character of the immediate area during construction but after construction the character of the landscape will be similar to the existing.	Slight	Minor adverse (-1)

Table3: Views from Residential Areas

Ref	Location	Approx. Distance	Existing View and Comment	Magnitude of Impact	Significance of Impact
R1	Farm at Pen-y-bryn	80m SE	Situated to the south east of the current route of the B4333 close to the diversion route - views are available.	Moderate	Minor adverse (-1)
R2	Maes-y-coed (properties to south of road)	300m N	Views towards the diversion route available from the properties. Vegetation provides some screening for the more distant properties.	Moderate	Minor adverse (-1)
R3	Maes-y-coed (properties to north of road)	400m N	Generally views are screened by vegetation and the properties to the south of the road but glimpsed views may be available.	Slight	Minor adverse (-1)
R4	Brynamlwg and Noddfa	700m N	Vegetation screens views.	None	0
R5	Pencnwc	600m NE	Vegetation screens views.	None	0
R6	Llwynbedw	1km NW	House screened by tall trees preventing views towards the site.	None	0

Ref	Location	Approx. Distance	Existing View and Comment	Magnitude of Impact	Significance of Impact
R7	Properties on road to Aberporth	900m NE	Vegetation screens views.	None	0
R8	Settlement of Blaenannerch	400m SE	Situated adjacent to the existing junction, houses on the edge of the settlement overlook the existing road layout. The properties at the northern edge of the settlement have clear views over the surrounding area and towards the diversion route.	Moderate	Minor adverse (-1)
R9	Rhyd	900m E	Possible views available from the upper windows of properties.	Slight	Minor adverse (-1)
R10	Properties on A487(T)	240m E	Hedgerow runs along the A487trunk road screening some views of the diversion route but views are available in places and from upper windows.	Moderate	Minor adverse (-1)
R11	Hen Efail, Cyttir-bach and Ty'rddol	800m S	Views screened by landform and vegetation.	None	0
R12	Nant-y-llan	700m S	Views screened by landform and vegetation.	None	0
R13	Cyttir Mawr	<10m W	New access road to Cyttir Mawr proposed so views of this will be available. Mature vegetation screens the diversion route.	Moderate	Minor adverse (-1)
R14	Rhosygadair Fawr	500m NW	Views available towards diversion route across fields.	Slight	Minor adverse (-1)
R15	Greenore	250m SW	The hedge along the A487trunk road hedge screens the majority of the views.	Negligible	Neutral
R16	Tremain	500m	Distant view available towards the diversion route.	Negligible	Neutral
R17	Treprior	1km W	View screened by vegetation.	None	0
R18	Ffynnonwen	800m W	Vegetation screens the views surrounding the diversion route but views may be available from the upstairs windows of the property.	Slight	Minor adverse (-1)
R19	Trefere Bella	1.1km W	Long distant views available over the diversion route and the surrounding area.	Slight	Minor adverse (-1)
R20	Maes glas	900m NW	Distant views available over the surrounding landscape although views of the diversion route are screened by vegetation.	None	0

Table 4: Views from Sites listed on the Sites and Monuments Record

Ref	Location	Approx. Distance	Existing View and Comment	Magnitude of Impact	Significance of Impact
S1	Aberporth Airfield	<10m E	Airfield still in use. Views available.	Moderate	Minor adverse (-1)
S2	Former Naval Compound	<10m N	Military buildings which have now been removed. Clear views will be available from this area.	Moderate	Minor adverse (-1)
S3	Round Barrow at Crug-gwyn	100m SE	Possible location of a round barrow possibly demolished during the construction of the airfield.	Moderate	Minor adverse (-1)
S4	Farm Buildings at Pen-y-bryn	80m SE	Red brick farm buildings surrounded by airfield. Situated to the east of the current route of the B4333 close to the diversion route - views are available.	Moderate	Minor adverse (-1)

Table 5: Views from Commercial Properties

Ref	Location	Approx. Distance	Existing View and Comment	Magnitude of Impact	Significance of Impact
C1	Hotel Complex	900m NE	View screened by surrounding vegetation.	None	0
C2	Airport buildings	0m E	Views available.	Moderate	Moderate adverse (-2)

Table 6: Views from Public Rights of Way

Ref	Location	Approx. Distance	Existing View and Comment	Magnitude of Impact	Significance of Impact
F1	Maes-y-coed to Rhosygadair Fawr	400m NW	Hedge along length of footpath generally screen the view although views available through gaps.	Slight	Minor adverse (-1)
F2	Maes glas to Parcllyn	950m NW	View not assessed. Possible long distant views.	Slight	Minor adverse (-1)
F3	Penlan to Westfield House	1km NE	Vegetation screens the majority of the view.	None	0
F4	Blaenannerch to Nant-y-llan	100m E	Views available from north end of footpath.	Slight	Minor adverse (-1)
F5	Tremain to Ffynnonwen	750m W	View generally screened by vegetation.	Negligible	Neutral
F6	Cyttir Mawr to Rhosygadair Fawr	0m S	Views of diversion route available especially to the southern end where the diversion affects the route of the footpath.	Moderate	Minor adverse (-1)
F7	Tremain to Nant-y-llan	600m SW	Long distant views available towards the diversion route.	Slight	Minor adverse (-1)
F8	Tremain to Trefwtial	700m SW	Long distant views available towards the diversion.	Slight	Minor adverse (-1)

Table 7: Views from Roads

Location	Approx. Distance	Existing View and Comment	Magnitude of Impact	Significance of Impact
A487(T)	<10m S	Views of diversion route presently screened by a hedgerow along the length of the road. Where new roundabout is to be implemented with the A487trunk road this will affect the view from the road.	Moderate	Moderate adverse (-2)
B4333	<10m N	Views will be available where new roundabout will be implemented but hedgerows screen the view for the majority of the length of the road that is to remain unaltered.	Moderate	Moderate adverse (-2)
Road to Maes glas	350m NW	Hedgerows screen the view for the majority of the road. Views available only from the easterly end of the road.	Slight	Minor adverse (-1)
Road to Pencnwc	250m E	A secluded lane where hedges screen the view for the majority of the road. Views available only from the southerly end of the road.	Slight	Minor adverse (-1)
Road to Hen Efail	400m E	Views available from the northern most end of the road only.	Slight	Minor adverse (-1)

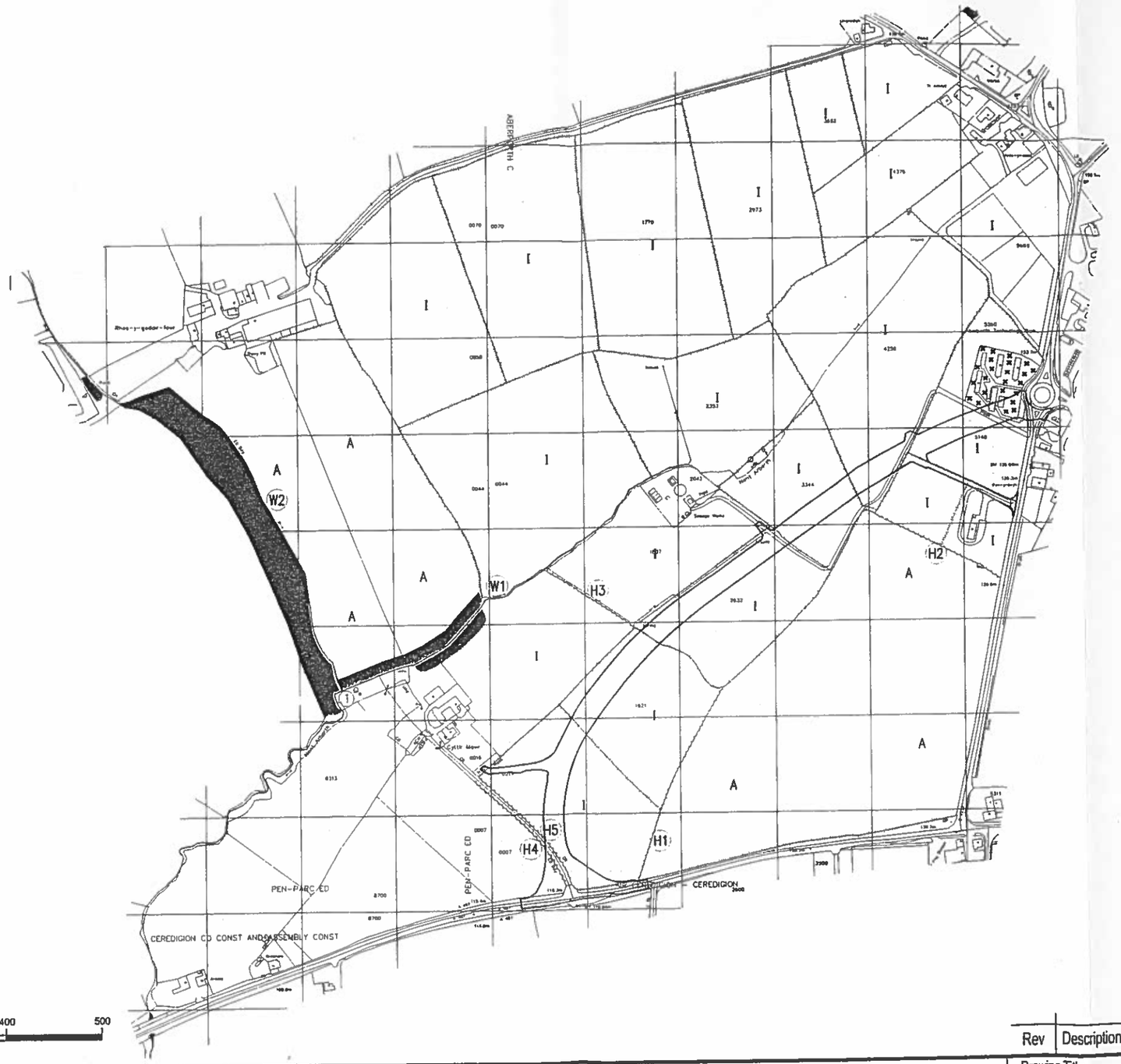
Table 8: Views from Listed Buildings

Ref	Location	Approx. Distance	Existing View and Comment	Magnitude of Impact	Significance of Impact
LB1	Milestone on A487 at Tremain	550m SW	Distant view available towards the diversion route.	Negligible	Neutral
LB2	St Michael's Church, Tremain	500m SW	Distant view available towards the diversion route.	Negligible	Neutral
LB3	Cow Shed at Treprior Farm, Treprior	1km W	View screened by vegetation.	None	0
LB4	Corn Barn at Treprior Farm, Treprior	1km W	View screened by vegetation.	None	0
LB5	Blaenannerch Calvinistic Methodist Chapel and Vestry, Blaenannerch	700m E	Glimpsed views towards the diversion route may be available.	Slight	Minor adverse (-1)
LB6	Milestone on A487 at Blaenannerch, Blaenannerch	750m E	Glimpsed views towards the diversion route may be available.	Slight	Minor adverse (-1)

APPENDIX E

Drawings

DO NOT SCALE: Contractor to check all dimensions and report any omissions or errors



KEY

- PLANNING APPLICATION BOUNDARY
- SPECIES POOR HEDGE
- SPECIES RICH HEDGE
- H1 HEDGEROW NUMBER
- SEMI NATURAL WOODLAND
- OPEN WATER
- W1 WATERCOURSE NUMBER
- A ARABLE
- I IMPROVED PASTURE
- EPHEMERAL VEGETATION
- 1 TARGET NOTE 1: JAPANESE KNOTWEED

Scale (metres)
100 200 300 400 500

Rev	Description	By	Chk	App	Date

ndale Court
adingley
eds
6 2UJ

Tel: 0113 278 7111
Fax: 0113 275 0623
e-mail:
leeds@wyg.com

White Young Green

Project: E4734

DIVERSION OF THE B4333
AT ABERPORTH AIR FIELD

Client:
CEREDIGION COUNTY COUNCIL

Drawing Title:
PHASE 1 HABITAT SURVEY

Scale at A3	Drawn By	Date	Checked By	Date	Approved By	Date
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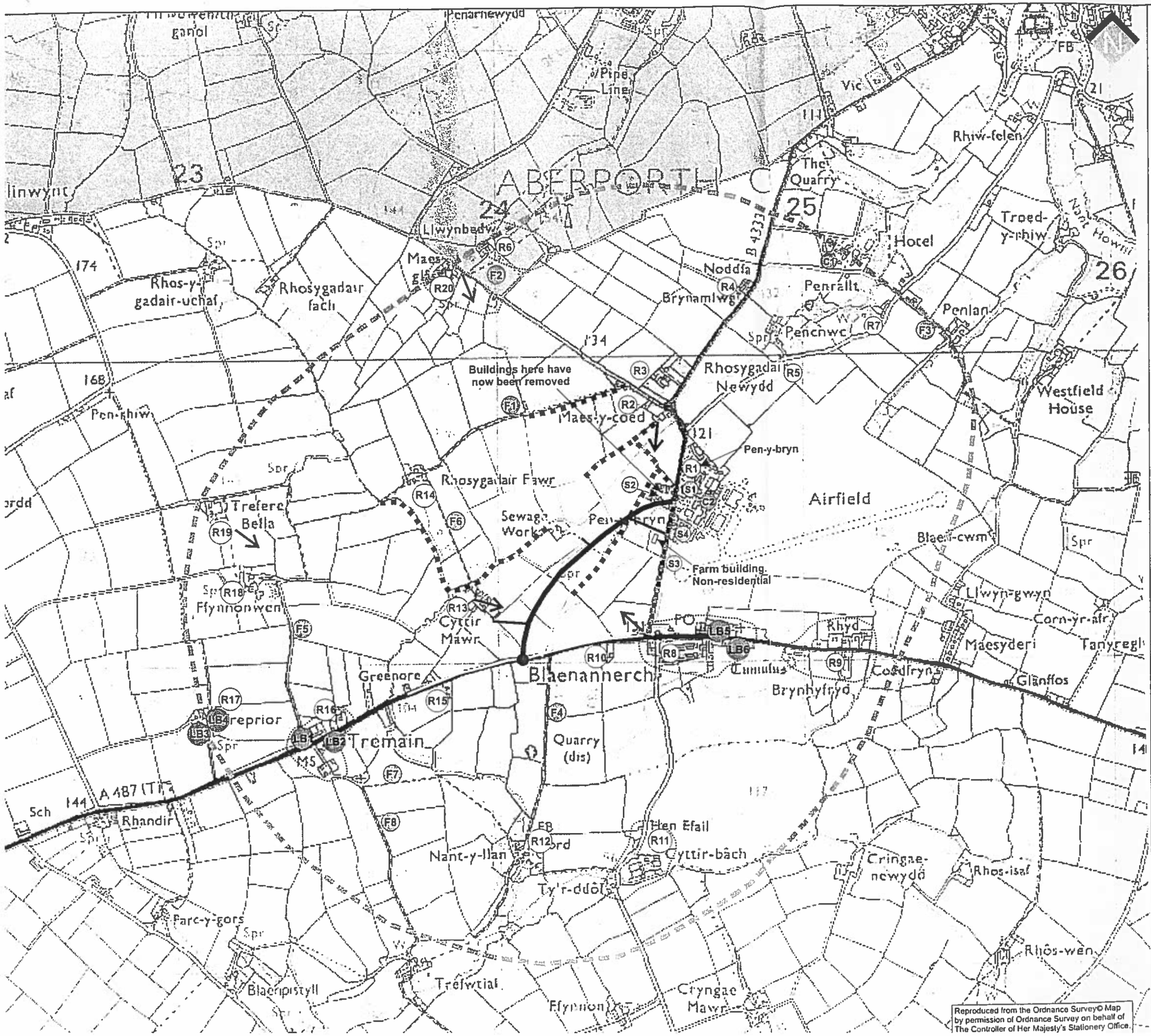
Project No	Office	Type	Drawing No		Revision	



KEY:

- PROPOSED DIVERTED ROUTE OF B4333
- SECTION OF B4333 TO BE DIVERTED
- STUDY AREA (APPROXIMATELY 1KM FROM SITE)
- RESIDENTIAL PROPERTIES
- GROUPS OF RESIDENTIAL PROPERTIES
- FOOTPATHS
- SMR SITES
- LISTED BUILDINGS
- OTHER RECEPTORS
- EXISTING HEDGEROWS (WITHIN IMMEDIATE VICINITY OF SITE ONLY)
- HEDGEROW WITH MATURE TREES
- KEY VIEWS
- SPECIAL LANDSCAPE AREA (ENV01) (CEREDIGION LOCAL PLAN DEPOSIT VERSION 1998)

NOTES:

White Young Green Environmental
Arndale Court
Headingley
Leeds
LS6 2UJ

tel : 0113 278 7111
fax : 0113 275 0623
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White Young Green

CLIENT: CEREDIGION COUNTY COUNCIL

PROJECT: DIVERSION OF THE B4333 AT ABERPORTH AIRFIELD

TITLE: LANDSCAPE FEATURES AND RECEPTOR LOCATIONS

SCALE: 1:12500

PROJECT NO.: E4734