Proposed Energy Centre Bilsthorpe Business Park, Nottinghamshire

Wader mitigation plan

Prepared for Peel Environmental Management (UK) Ltd. and Bilsthorpe Waste Ltd

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Contents

1 Introduction

This document provides a Wader Mitigation Plan to address likely adverse effects on ground-nesting waders as a consequence of the development of the Bilsthorpe Energy Centre, Bilsthorpe Business Park, Nottinghamshire.

The Mitigation Plan has been produced as part of a submission of additional information under Regulation 22 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011.

The Environmental Impact Assessment (EIA) of the Energy Centre predicted the displacement of one pair of little ringed plover (*Charadrius dubius*) and partial loss of foraging habitat for lapwing (*Vanellus vanellus*), up to five pairs of which will be displaced from another part of the former colliery site by a consented Solar Farm development.

The plan is designed to provide suitable near-site breeding habitat for little ringed plover and lapwing, in order to offset predicted impacts and help to achieve no net loss of biodiversity interest as a consequence of the Energy Centre development.

The total area proposed for inclusion in the mitigation is over 4.6ha of potentially suitable breeding wader habitat.

As a consequence of this additional mitigation proposal, the Biodiversity Offsetting Metric included in the EIA has been re-calculated, and is appended to this document.

2 Scope and methodology

2.1 Plan format

The Mitigation Plan format follows guidelines in BS42020:2013 (*Biodiversity — Code of practice for planning and development*) for post-development management of habitats and species, and is structured as follows:

a) Description and evaluation of features to be managed.

b) Ecological trends and constraints on site that could influence management.

c) Aims and objectives of management.

d) Appropriate management options for achieving aims and objectives.

e) Prescriptions for management actions.

f) Preparation of a work schedule (including an annual work plan capable ofbeing rolled forward over a five year period).

g) Body or organization personnel responsible for implementation of the plan.

h) Monitoring and remedial measures.

i) Funding resources and mechanisms to ensure sustainable long-term delivery of the proposed management.

The Plan is focussed on the habitat requirements of two wader species: lapwing and little ringed plover, although the needs of other species which are likely to occur on site such as oystercatcher are also considered.

2.2 Methodology

A search for potential mitigation sites was undertaken for areas within the wider land ownership of Haworth Estates at Bilsthorpe Colliery. Known constraints were overlain on a site plan, including an existing wind farm, and areas of future development (e.g. a consented Solar Farm site). A distance of 200m from each turbine was taken as a possible displacement distance, within which lapwing and little ringed plover would be less likely to breed; the rationale for this is explained in more detail in Section 4 below.

The initial site search suggested that an area of pasture land in the north-west of the site could be suitable for enhancement for breeding waders. Separate, independent

breeding bird surveys carried out by Argus Ecology and SLR Consulting in 2013 had not recorded breeding waders on this part of the site, so the key issue to determine was whether the site could be enhanced to be suitable for waders, rather than whether its carrying capacity (i.e. breeding density) could be improved.

A site visit was carried out on 24th February 2014 to assess the opportunities and constraints presented the potential mitigation site. Current habitat quality was assessed and constraints identified which might explain the lack of current usage by waders. Potential improvements were identified, and the location of any proposed additional features was plotted in the field using a mapping-grade Topcon GMS-2 Pro GNSS receiver. Other parts of the site were also visited for comparison, including the planned Solar Farm site which held breeding lapwings in 2013, and the proposed Energy Centre site which had supported a pair of little ringed plover in 2013.

3 Description and evaluation of features

3.1 Habitats and vegetation

Habitats present in proposed mitigation area

The proposed mitigation area is located just over 100m north of the proposed development site, and incorporates the top and south-facing slopes of a mound which runs along the northern part of the former colliery site. The location is shown on Figure 1, and illustrated on the oblique aerial photograph below, with most of the site visible (shaded blue); the proposed Energy Centre boundary is shown edged red.

Photo 3.1: Mitigation area location

Note that this is a more recent aerial than currently available on Google Earth or Bing Maps, and shows changes following coal recovery operations.

The northern part of the mitigation area comprises part of a large field of improved grassland, managed as sheep-grazed permanent pasture. This is divided by a fence from an area of less well-established open grassland occupying a south-facing slope, which the tenant does not consider currently suitable for regular grazing. The flat ground at the base of this slope was damp during the February 2014 survey, with some standing water in wheel-ruts, and evidence of occasional standing water during wetter periods.

Photo 3.2: Flat ground – south part of mitigation area

The agricultural grassland is partly divided by a small area of scrub and a post-and-rail fence running north-south, although this is not stock-proof, and the field is managed as a single unit, as illustrated by the photograph below:

Photo 3.3: Scrub and fence – looking north

The landscaped mound has a broad, relatively level top offering an open aspect, which is illustrated by the photograph below, taken looking west from the fenced boundary with the established permanent pasture and more recently-established sward.

Photo 3.4: Elevated grassland within proposed mitigation area

The western edge of the mitigation area slopes down steeply to a row of tall poplars just over the site boundary, while the northern edge slopes down to a hedgerow adjacent to a minor road. There is also a small plantation on the northern slope, with young ash trees in the upper, southern part of the enclosure. These areas are not suitable for breeding waders, because of the slope and proximity of taller trees; although they would be managed as part of the same grazing unit, they would not be considered part of the mitigation area.

Habitats currently utilised by waders

There are two areas currently utilised by breeding waders which would be displaced by currently permitted and proposed developments at Bilsthorpe Colliery.

The proposed Energy Centre site supported a pair of little ringed plover in the 2013 breeding season, which were also observed adjacent to areas of shallow standing water on the planned Solar Farm site to the south.

The suitability of the Energy Centre site for little ringed plover was a consequence of the loss of vegetation and creation of areas of bare ground due to the coal recovery operations which had been carried out. Parts of the site had been colonised by tall ruderals later in 2013, rendering it less open and less suitable for little ringed plover, as illustrated by the photograph below:

Photo 3.5: Proposed Energy Centre site in February 2014

Occurrence of little ringed plover on this site in the absence of development is therefore likely to be ephemeral in nature, as habitat quality declines due to natural succession.

The Solar Farm site supported an estimated five pairs of lapwing in 2013, occupying an area of elevated improved grassland on the former landfill cap. In February 2014 this area maintained its suitability for breeding lapwing, with a number of areas of shallow standing water present within an area of open grassland, as illustrated overleaf. Loss of this site will also affect little ringed plover breeding on the Energy Centre site, as they will lose aquatic marginal habitats for foraging.

Photo 3.6: Grassland and shallow standing water – Solar Farm site

3.2 Evaluation of habitat quality for breeding waders

Habitat requirements for breeding little ringed plover

Little ringed plover require bare or sparsely vegetated habitats for breeding; their natural habitat includes areas such as shingle islands on braided streams within rivers. They colonised Britain in the second half of the 20th century after first breeding in 1938, taking advantage of the availability of similar habitat in sand & gravel quarries. They will also breed on recently cleared industrial sites and colliery spoil heaps.

Key habitat requirements include:

- Bare, preferably coarse-textured shingle substrate (if set in grassland, at least 0.2ha in area);
- Availability of shallow water margin habitats; and
- Limited opportunities for predators (e.g. maintaining open aspect with limited cover around nest sites.

Habitat requirements for breeding oystercatcher

Oystercatcher prefer to nest in bare areas with a loose substrate (Heppleston, 1972), and would benefit from habitat creation targeted at little ringed plover.

They also require short grassland vegetation with penetrable ground for foraging; unlike lapwing and little ringed plover, oystercatcher feed by probing.

Habitat requirements for breeding lapwing

The management needs of lapwing on agricultural land are now reasonably well-established, with recently published guidance from Natural England (TIN090: Natural England, 2011), and RSPB (Farming For Birds – Lapwing advice sheet: http://www.rspb.org.uk/Images/lapwing_england_tcm9-207562.pdf).

For permanent grassland habitats, key management principles include:

- Maintaining a short sward in spring (grass height in March 3cm or less over 80% of the field);
- Maintaining taller patches and tussocks for shelter (10-15cm height in March, covering no more than 20% of the field);
- Reducing the risk of trampling nests by keeping stocking levels low between mid-March and mid-June;
- Grazing the field more intensively in late summer and autumn to produce the short sward height needed in spring;
- Creating or maintaining damp areas within each field, either by creating shallow scrapes or linear footdrains (Smart *et al*, 2006); and
- Avoiding areas with trees or other vantage points, which could be used by predators.

Habitat quality for breeding waders

The proposed mitigation area did not support any breeding waders in 2013, so it is important to understand the potential constraints which are likely to be restricting current habitat quality. These include:

- Lack of standing water during the breeding season;
- Grazing by sheep, giving an even sward without longer vegetation to provide cover for chicks;
- Grazing by sheep during the breeding season, increasing the risk of nest losses through trampling;
- Absence of winter grazing, leading to a longer, less suitable sward for nesting at the start of the breeding season;

- Proximity of hedgerows and plantation, increasing predation risk, and subdividing fields into smaller, more enclosed units;
- Lack of bare shingle habitat for little ringed plover;
- Proximity of wind turbines; and
- Presence of steeper slopes with trees and hedgerows around the northern and western margins.

With respect to wind turbines, although a buffer distance of 200m was chosen to aid mitigation site selection, evidence suggests that this is conservative with respect to lapwing. A study of breeding bird displacement distances around turbines (Pearce-Higgins *et al*, 2009) did not find a significant effect on proximity to turbines for lapwing, although there was a (non-significant) reduction in probability of occurrence within 200m of the turbine. Figure 2 shows that the majority of the site lies more than 200m from the nearest turbine location (turbine 4).

The presence of the wind turbine and steeper slopes cannot be changed, and areas in closer proximity to the turbine and on steeper slopes have been excluded from consideration as potential mitigation habitat. However, the other factors are all amenable to habitat improvements, giving a realistic prospect of accommodating some of the waders which will be displaced from the Solar Farm as well as fully mitigating any habitat losses as a consequence of the Energy Centre.

4 Ecological trends and constraints on site

4.1 Ecological trends

In the absence of any additional intervention, the agricultural grassland in the northern part of the site is likely to continue to support improved grassland, with continued summer grazing by sheep.

The more recently established grassland in the southern part of the site is likely to establish a closed grass sward with time, but its ability to support grazing stock may be limited without further intervention (e.g. oversowing and fertilising). Poor drainage at the foot of the slope may also limit its value for agriculture.

Surrounding plantation woodland will become more established, with immature trees on the northern boundary of the plantation, and the area of scrub between the two former field units increasing in height.

4.2 Constraints

The same constraints which are currently discouraging use of the site by breeding waders will continue to operate in the absence of changes in management.

The edge effect of plantations and scrub will increase with greater tree and shrub height, and will further reduce habitat quality for waders.

5 Aims and objectives of management

5.1 Aims

The primary aim of management is to establish and maintain conditions suitable for the successful breeding of ground-nesting waders, including lapwing, little ringed plover and oystercatcher.

5.2 Objectives and vision for site

Grassland habitats

The grass sward will be short in the early spring over 80% of the field, with some tussocks of taller vegetation remaining, providing suitable conditions for nesting lapwing. Grazing pressure will reduce between mid-March and mid-June, reducing the risk of trampling nests and chicks. A small scrape will provide cover and a foraging area for chicks.

Around 2.8ha of grassland on the elevated part of the site would be suitable for breeding lapwing. As lapwing territories can be as small as 0.5ha when nesting, this could support up to 5 pairs; however, a more realistic target based on densities on the Solar Farm site would be 2 pairs.

The grassland area would also be suitable for foraging oystercatcher, the scrape providing areas of greater penetrability compared to other areas of grassland.

Scrape and shingle habitats

The flat ground at the base of the slope will support an area of shingle large enough for one pair of nesting little ringed plover. A scrape, holding water well into the breeding season will provide suitable foraging habitat for adult birds, with ready access for chicks. This area will also be suitable for a pair of nesting oystercatcher.

Woodland and scrub

The young plantation on the northern edge of the woodland will be maintained as coppice, restricting height growth to less than 3-4 metres and limiting vantage points for avian predators.

Unnecessary fencing and areas of defunct hedgerow and scrub patches will be removed to maximise openness and limit habitats for ground-based predators.

6 Appropriate management options for achieving objectives

6.1 Boundary features and adjacent habitats

Changes to field boundaries

It will be necessary to rationalise the field boundaries in order to manage the mitigation area as a single agricultural unit and control grazing levels. As Figure 2 illustrates, this can be achieved by removal of part of the existing fencing and building a new fence across the slope. The eastern boundary is determined by proximity to the nearest wind turbine, excluding areas which are less likely to be used by breeding waders.

By extending west to exclude part of the northern slope which is unsuitable for breeding waders, then north, each field can retain its own water supply, as there are two adjacent troughs on a former field boundary in the north-western part of the site.

Scrub and plantation management

The small area of scrub and defunct hedgerow in the western part of the site should be removed, along with any remaining fencing. A 15m strip on the northern edge of the plantation to the west, and a 0.12ha area of young ash trees in the plantation to the north should be coppiced, and maintained on a short rotation to prevent excessive height growth. This area may in any case be vulnerable to ash dieback disease.

6.2 Grassland management

Grazing management

The necessary changes in attractiveness of the established grassland for breeding waders can be accomplished by changes in the grazing regime, in terms of timing, type of stock and stocking density, in accordance with the following management principles:

- Maintaining a short sward in spring (grass height in March 3cm or less over 80% of the field);
- Maintaining taller patches and tussocks for shelter (10-15cm height in March, covering no more than 20% of the field);

- Reducing the risk of trampling nests by keeping stocking levels low between mid-March and mid-June;
- Grazing the field more intensively in late summer and autumn to produce the short sward height needed in spring;
- Creating or maintaining damp areas within the field by creating shallow scrapes; and
- Maintaining an open aspect to fields, avoiding trees or other vantage points which could be used by avian predators.

All species will benefit from a reduction or temporary cessation in grazing pressure during the breeding season, in order to reduce the risk of livestock trampling eggs.

If available, grazing by cattle or horses is preferable on fields managed for lapwing, both to reduce the risk of nest trampling in spring (cattle and horses are less likely to trample than sheep), and to create a more varied sward through more intensive grazing in autumn. Horse grazing may be preferable to cattle during the breeding season, as they are more likely to avoid lapwing nests (Peak Birds Project, 2007).

Levels of 1 cow / hectare between mid-March and mid-June have been recommended in the past by the RSPB. This is equivalent to a very light grazing pressure (in terms of forage intake, a 550kg dairy cow is equivalent to 1 Livestock Unit (LU); a smaller 400kg beef cow is equivalent to only 0.56LU (Crofts & Jefferson, 1994). A grazing intensity of 0.56LU / ha is probably too low in itself to prevent the development of a rank, tussocky sward as the breeding season progresses, which will not be suitable for lapwing. If cattle grazing is employed, a balance may have to be reached between preventing development of rank vegetation during the breeding season and the risk of nest trampling.

Horse grazing will result in a greater offtake per head of stock compared to beef cattle; a mature (>24 month) horse is equivalent to 1.0LU (Chapman, 2007), and a breeding season stocking rate of 1LU / ha (= 1 horse / ha) will be likely to provide the optimum balance between maintenance of a short sward and an acceptable risk of nest trampling. The selective grazing of horses is also likely to maintain a balance between a short sward with taller dunging areas. However, this option may not be advisable because of the greater risk of damage to the sward on the poorer soils in the south of the site by horse grazing.

Improvement of less well-established sward

The south-facing grass sward was not very well-established in early 2014, and may break down under grazing management, particularly on the steeper parts of the slope. This should be assessed following the 2014 growing season to determine whether any amendments are necessary, including fertilising, over-seeding, or possibly addition of topsoil and re-sowing. This is not necessary on any areas of flat ground surrounding the scrape and shingle area, where a poorer soil is an advantage.

6.3 Scrape management

Construction of scrape and shingle area

A shallow scrape should be excavated on flat ground in the southern part of the slope of around 0.1ha in area; this encompasses an area of naturally wet ground. Material from the scrape should be spread evenly around, so as to avoid creating steep slopes or bunds close to the water. The base of the scrape should be compacted by the excavator bucket in order to reduce permeability.

To the north of the scrape, an area of 0.3m deep shingle (gravel) should be spread over the remainder of the flat area at the foot of the slope, which should provide an area of around 0.2ha.

Another smaller scrape should be excavated in an area of existing damp grassland within the improved grassland area on the top of the slope.

Locations of proposed scrapes and shingle areas are shown on Figure 2.

After-care requirements

The main after-care requirements are for control of encroaching vegetation on the shingle habitat. Periodic application of a non-selective, systemic herbicide should be undertaken after the end of the breeding season.

7 Prescriptions for management actions

7.1 Establishment works (year 1)

The appropriate management options set out above can be translated into the following actions:

Table 7.1: Establishment work prescriptions

Habitat / feature	Operation	Details	Timing
Scrub	Removal	Grub out small area of scrub (ca. 100m^2) on old field boundary, together with any shrubs in defunct hedgerow / fence to north.	Aug. – Feb.
Fencing	Removal	Remove partially collapsed fencing along ca. 115m former field boundary. Remove ca. 142m length of post-and-wire fencing along current field boundary.	Aug. – Feb.
Fencing	Installation	Construct ca. 485m stock-proof post-and-wire fencing with gate.	Not critical
Scrub	Coppicing	Coppice 15m strip (0.22ha) along northern edge of SW plantation, and 0.12ha area of young ash trees in northern plantation.	Winter
Scrapes	Construction	Shallow excavation of scrape to <0.5m maximum depth over 0.1ha area, with spoil spread over flat area of field.	Aug. – Feb.
Shingle bed	Construction	Spread 0.2ha area of gravel in a 0.3m thick layer, compact with excavator bucket.	Aug. – Feb.
Grassland	Improvement of sward	Assess need for fertiliser application, over-sowing or additional topsoil application / re-seeding, then carry out appropriate measures. 7ha area, extending east from mitigation area.	Assess summer / autumn

7.2 Maintenance prescriptions

Habitat	Operation	Details	Timing
Grassland	Monitor sward height	Check <30mm over 80% of field area to monitor effectiveness of earlier management	Early March
Grassland	Grazing	Graze with cattle at 0.56LU/ha (1 head beef cattle / ha)	mid-March – mid-June
Grassland	Grazing	Graze with cattle or cattle / sheep at levels sufficient to reduce sward height to 20mm across 80% of field by end of season	Late June – autumn
Grassland	Mowing	Optional operation to take late-season hay or silage crop if stock not available for grazing in this period.	Late summer / autumn
Shingle bed	Herbicide treatment	Assess requirement for treatment of tall weed species; spot-treatment with appropriate systemic herbicide if necessary. Specification and use should be in accordance with Plant Protection Products (Sustainable Use) Regulations 2012 and relevant Codes of Practice	August
Plantations	Coppicing	Coppice same areas as year 1 when regrowth reaches 3m, or on a 3-year cycle, whichever is sooner	Winter (triennial)

8 Work schedule

8.1 Establishment works (year 1-2)

Action	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Boundary works											
Fence removal								year 1				
New fencing								year 1				
Scrub removal								year 1				
Coppicing	year 2									year 1		
	Scrape and shingle bed											
Excavate scrape								year 1				
Form shingle bed								year 1				
	Grassland management											
Assess pasture quality								year 1				
Topsoiling and re-seeding (if required)								year 1				
Over-sowing (if required)									year 1			
Manure spreading			year 2									

8.2 Maintenance works

Action	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Plantations											
Coppicing	year 4, 7, 10 etc.									year 3, 6, 9 etc.		
	Scrape and shingle bed											
Herbicide treatment								As required				
	Grassland management											
Monitor sward height			annual									
Breeding season grazing			annual									
Post-breeding season grazing						annual						
Mowing									as required			
Manuring			as required									

9 Implementation

The Wader Mitigation Plan will be implemented and funded by the site operator, by agreement with Haworth Estates as landowner and their grazing tenant.

10 Monitoring and review

Monitoring provisions

Measures have been built into the management prescriptions and work schedule set out above to monitor the success of the Wader Mitigation Plan in achieving its habitat quality targets. These include:

- Annual checks on sward structure and height to assess achievement of suitable quality standards;
- Annual checks on shingle bed area to determine requirements for weed control; and
- Annual checks on grassland quality and resilience, to assess need for further fertilising or any remedial treatment.

Monitoring of habitat utilisation by fauna would provide further evidence of the attainment of quality targets. The appropriate methodology for assessing utilisation of enclosed fields by breeding waders is O'Brien & Smith (1992), which requires two visits during the breeding season.

Remedial measures

Remedial measures to address lack of attainment of habitat targets have been built into the management prescriptions and work programme above. Additional measures may be required to address issues which may arise (e.g. invasive species such as Australian swamp stonecrop (*Crassula helmsii*) colonising the scrape), and to address any lack of attainment of breeding wader targets.

The results of monitoring may also suggest changes to the management prescriptions – for example, if tree growth is more vigorous than anticipated, coppicing frequency may need to be increased. Implementation of the plan should be flexible enough to make these adjustments.

Examples of anticipated and potential remedial measures are summarised in the table overleaf.

Table 10.1: Potential remedial measures

Feature	Trigger	Action
Breeding waders	No breeding little ringed plover; <2 pairs breeding lapwings	Assess whether any further habitat quality improvements can be made.
Breeding waders	Failure to breed successfully	Assess whether improvements in habitat quality, predator control or exclusion, or changes to stocking levels would improve likely breeding success.
Grassland	Decline in quality of sward on poorer quality soils on southern slope	Assess whether temporary stock exclusion using electric fencing would allow recovery, or whether further remediation needed
Scrape (and other habitats)	Presence of invasive species listed on Schedule 9 Wildlife and Countryside Act 1981 (as amended)	Eradication with appropriate bio-security measures in accordance with species-specific guidance.

11 References

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Appendix 1 Modification of biodiversity offsetting metric

1 Introduction

The Energy Centre ES included a calculation using the DEFRA Biodiversity Offsetting Metric of the value of proposed on-site habitat creation, set against the existing value of the site. This was carried out using DEFRA guidance (DEFRA, 2012), including the published 'distinctiveness' scores for valuing habitats.

Consultation responses to the ES from the County Council and Wildlife Trust pointed out that this approach did not take into account the full ecological interest of the site, as it did not account for birds. In fact this limitation of the metric was acknowledged in the ES, which highlighted the predicted impact on birds, including the cumulative impact of currently consented developments which had not been adequately mitigated. The Wader Mitigation Plan is essentially a response to this deficiency in the biodiversity offsetting methodology.

As the Mitigation Plan proposes a significant addition to the area of land managed for nature conservation, it is pertinent to re-calculate the offsetting metric to take this into account. Since completion of the ES, further work on the surface water drainage and flood attenuation system has confirmed that the attenuation feature is unlikely to hold permanent standing water; this requires a further minor revision of the offsetting metric calculation. Standing water and wet grassland have been taken out of the calculation, and replaced with species-rich grassland habitat; this is a conservative assumption, since it could be reasonably anticipated that wet grassland (a higher-value habitat) would develop in the base of the attenuation lagoon.

In re-calculating the metric, it should be recognised that deficiencies in the methodology will continue to skew the results. The target habitat over much of the mitigation area is improved or semi-improved grassland, which have a low 'distinctiveness' score of 1. The ecological value of the mitigation arises from changes in habitat structure, leading to greater probability of utilisation by target species and a reduced risk of nest predation or chick mortality. This is not adequately accounted for in the offsetting metric, resulting in a neutral result for most of the mitigation area.

The value of the area of shingle could also be assessed as 'low' if it is assigned to the 'other artificial rock exposure and waste' category, which is clearly an inadequate

representation of a feature designed to support a Schedule 1 breeding bird. However, application of DEFRA guidance (Appendix 1) suggests that it should be included as a secondary habitat category of a single habitat parcel, in this case 'other standing open water and canals', which has a 'medium' score of 2. These caveats should be borne in mind when assessing the true value of the mitigation area.

2 Re-calculation of value

Valuation of habitat creation

The following table provides a re-calculation of Table 8.12 in the ES.

Table A1.1: Valuation of habitat creation

Habitat	Equivalent in DEFRA guidance	Distinctiveness	Multiplier	Area (ha)	Value
					(biodiversity units)
Species-rich grassland	Other neutral grassland	Medium	4	0.671	2.684
Scrape and shingle area	Other standing waters	Medium	4	0.361	1.444
Sub-total				1.032	4.128
	-	Condition multiplier – 'med'	4	TOTAL	16.512
Existing habitat					
Bare ground	Other artificial rock exposure and waste	Low	2	0.671	1.342
Improved grassland	Improved grassland	Low	2	0.361	0.722
		(Condition multiplier 1)		TOTAL	2.064
Net-total				(16.512 - 2.064)	**14.448**

Application of risk and time multipliers

The next stage is to account for the risk of successful creation and time taken to achieve target habitats. In the ES a 'low risk' multiplier was used for the on-site mitigation; here a more conservative 'medium risk' multiplier is used for the portion of , to take into account uncertainties in habitat utilisation by birds. The same <5 year 'time multiplier' of 1.2 is used, as the additional habitats do not take a long time to create. This gives the following figures, after disaggregating the different habitat components values set out above.

Table A1.2: Application of risk and time multipliers

Component area	Total units	Risk multiplier	Time multiplier	TOTAL
Species-rich grassland	9.394	1.0	1.2	**7.828**
Scrape and shingle	5.054	1.5	1.2	**2.808**
				10.636
			Value of Energy Centre site	*-8.35*
			Net increase in biodiversity units	**+2.286**

This doubles the value of habitat creation compared to the values in the ES of 1.142 biodiversity units, even after accounting for the fact that the majority of habitat creation works are not accounted for in the calculation.

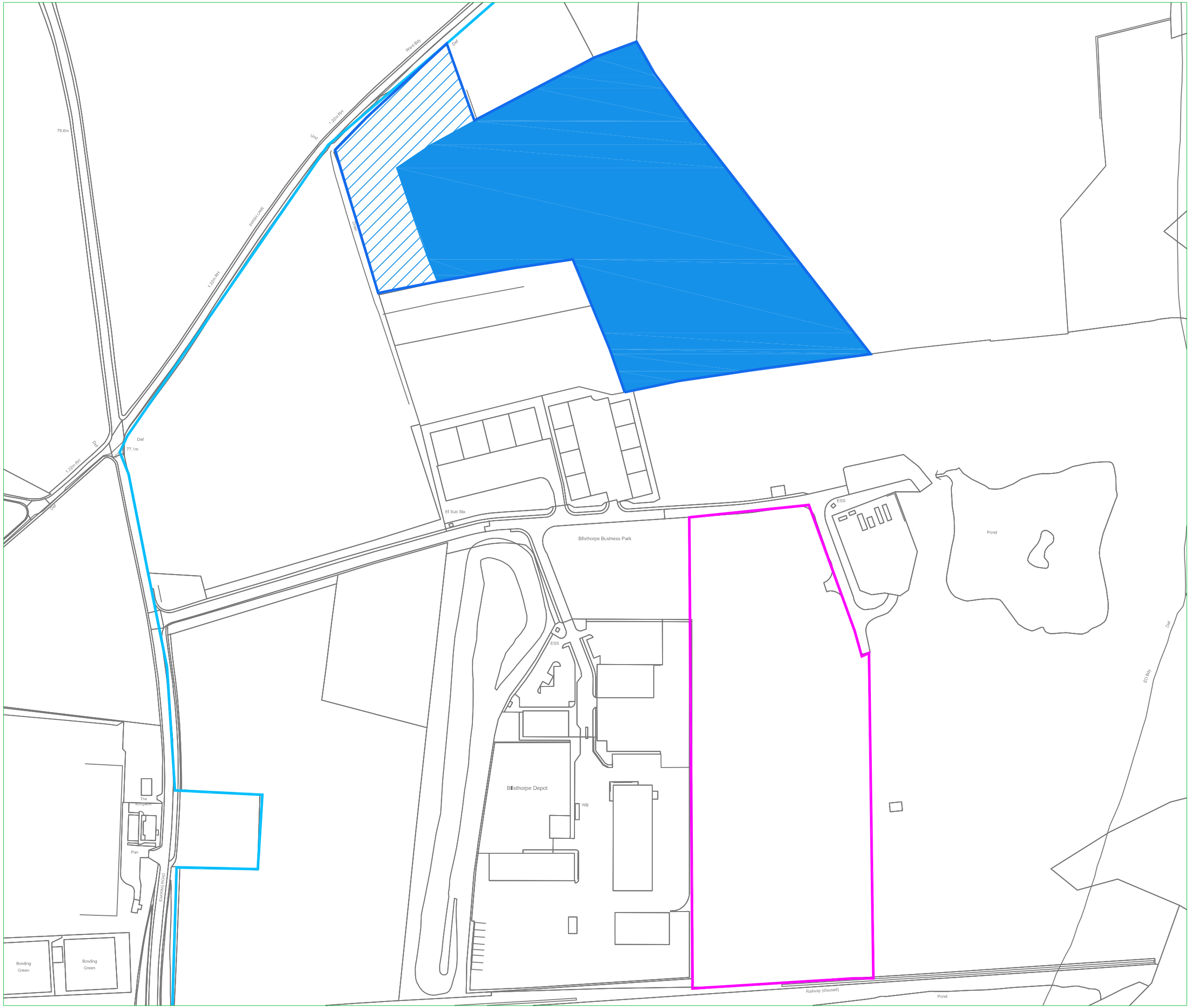
Bilsthorpe, Nottinghamshire

ENERGY CENTRE

WADER MITIGATION PLAN

KEY

- Mitigation area
- Energy Centre location
- Within mitigation area but not suitable for breeding waders



argus ecology

The Greenhouse, Greencroft Industrial Park,
Annfield Plain, Co. Durham, DH9 7XN

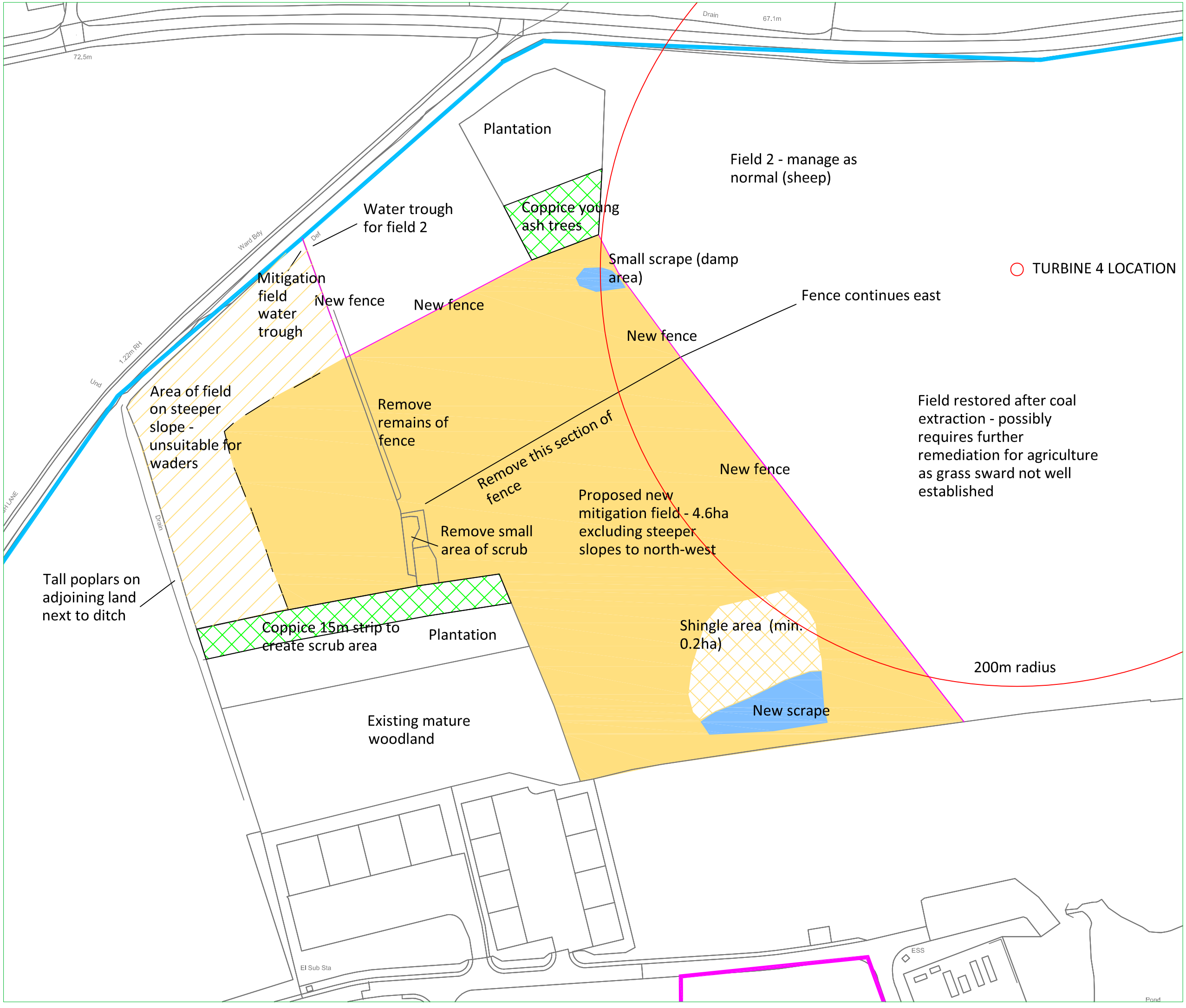
Figure.1: Mitigation area location

Version 1.0, 25/06/2014

Bilsthorpe, Nottinghamshire

ENERGY CENTRE

WADER MITIGATION PLAN



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The Greenhouse, Greencroft Industrial Park, Annfield Plain, Co. Durham, DH9 7XN

Figure.2: Mitigation proposals

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