PETERBOROUGH CITY COUNCIL

Cambridgeshire County Council

Cambridgeshire and Peterborough Minerals and Waste Development Plan

Block Fen / Langwood Fen Master Plan
Development Plan Document

Draft Supplementary Planning Document
Autumn 2009

Preface

Cambridgeshire Block Fen / Langwood Fen Master Plan Supplementary Planning Document

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If you require this document in another format please contact:

Minerals and Waste, Strategic Planning
Cambridgeshire County Council,
Shire Hall,
CAMBRIDGE, CB3 0AP

Tel: +(44) 01223 715 529
Email: PlanningDC@cambridgeshire.gov.uk

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1 Introduction

Purpose of the Master Plan

1.1 The purpose of this Master Plan is to provide a more detailed land use planning framework for mineral and waste activity in the Earith / Mepal area. It therefore conforms to and builds upon the proposals set out in the Cambridgeshire and Peterborough Minerals and Waste Plan Core Strategy. It should be read in conjunction with this Plan, and with other parts of the Minerals and Waste Local Development Framework.

Background

1.2 The Cambridgeshire and Peterborough Minerals and Waste Plan identifies the Earith / Mepal area as a strategic area for sand and gravel extraction and construction / demolition waste management until 2026 and beyond. This area has extensive reserves of good quality sand and gravel needed to supply the construction industry, which will be building the new housing, employment, schools and other development planned for Cambridge, and the wider area. The area will also help to recycle and dispose of construction soils and sub soils arising from the development, which will be taking place.

1.3 The Earith / Mepal area is one of high quality agricultural land, and is primarily in this use. However, Block Fen, Langwood Fen and adjacent areas have established sites for sand and gravel extraction, and some already contribute to the management of soils and waste construction and demolition materials.

1.4 In considering the further development of the area significant new opportunities have been identified which could be delivered through additional mineral extraction and quarry restoration. These have largely been shaped by the location of the area next to the Ouse Washes, which is one of the few remaining fragments of wetland habitats within the Fens. It is of international importance for its wintering waterfowl and for a suite of breeding birds, including snipe and black-tailed godwit.

1.5 The Ouse Washes area is in an 'unfavourable' condition. The Ouse Washes is designated as a wetland of international importance (Ramsar site) under the Ramsar convention, and, in 2000, was formally listed on the Montreux Record as a site undergoing ecological change. The main cause of the deterioration of the nature conservation interests is changing patterns of flooding with unseasonal summer flooding and longer deeper winter flooding.

1.6 Mineral extraction followed by appropriate restoration offers the opportunity to deliver two equally important strategic objectives. Firstly, it can provide strategic water storage bodies which can help to intercept water before it goes into the Counter Drain, and also take some of the water from the Counter Drain which would otherwise be pumped into the Ouse Washes, thereby managing flood risk in a more sustainable way. In addition, quarry restoration using inert construction and demolition waste soils can create a significant amount of new lowland wet grassland, providing new breeding areas for birds such as the black-tailed godwit, snipe, redshank and lapwing.

Picture 1.1 Redshank (Courtesy of RSPB)

Picture 1.2 Yellow Wagtail (Courtesy of RSPB)

1.7 Timing is crucial, if the opportunities outlined above are to be taken forward we need to decide and plan for this now, before the current restoration plans for the existing quarries are started. The current plans aim to return the land in the middle of the Block Fen area to an arable agricultural after use, and one quarry restoration work will commence in the short term.

1.8 The framework for future sand and gravel extraction and the management of construction and demolition waste in this area is set out in Cambridgeshire and Peterborough Minerals and Waste Core Strategy which covers the overarching land use policy. This Master Plan sets the more detailed proposals for this area. A list of the key policies are in 11 'Appendix 1 '.

1.9 As the area is so sensitive in terms of nature conservation a special study to determine whether the proposals could have an adverse impact on the Ouse Washes and other European important sites has been undertaken. This study, called an Appropriate Assessment, concluded that the proposals in this Master Plan have passed the Assessment as any potential to adversely impact on European or Ramsar sites can be avoided by legally enforceable measures.

The Block Fen / Langwood Fen Area

1.10 The Block Fen / Langwood Fen area lies to the west of the Ouse Washes, north of the A142 and south of the Forty Foot (Vermuyden's) Drain. The western boundary is a line running north south down Langwood Hill Drove to the A142. The Master Plan area lies in the parishes of Mepal and Chatteris.

1.11 The area is characterised by open low lying high quality agricultural land, drained by a series of man made drains and pumps operated by the Sutton and Mepal Internal Drainage Board. Other than the drains there are relatively few other landmarks. The area is relatively sparsely populated, principally by farms or scattered dwellings, linked by small droves and byways.

Nature Conservation

1.12 The area lies adjacent to the Ouse Washes which is a wetland of national, European and international importance. At the national level it is notified as a Site of Special Scientific Interest (SSSI) for its wet grassland, breeding and wintering waders and wildfowl along with aquatic flora and fauna largely associated with the ditches and drains.

1.13 At the European level, the Ouse washes is designated as a Special Protection Area (SPA) for the number and variety of breeding and wintering waders and wildfowl, along with the wintering population of hen harrier. The two parallel linear water courses known as the Counter Drain / Old Bedford (outer river) and the Old Bedford / Delph (inner river) are also designated at the European level for a population of Spined Loach, one of four known main localities for this fish species. The relevant citation for all the designations of the Ouse Washes are in Appendix 6.

1.14 The Ouse Washes is one of the largest areas of seasonally flooded washland in Britain which, when floodwaters permit, is managed using traditional agricultural methods of summer grazing and hay cutting. The washlands regularly host impressively large numbers of wintering waterbirds, which qualifies it as a Wetland of International Importance under the Ramsar Convention.

Land Drainage and Water Storage

1.15 Immediately east of the Master Plan area is the Counter Drain, east of this is the River Delph and the Hundred Foot / New Bedford River Ouse. These watercourses supports the artificial drainage of a large part of mid Cambridgeshire, up through Bedfordshire to the river source in Northamptonshire.

1.16 The Ouse Washes lie between the River Delph and the parallel bank of the Hundred Foot / New Bedford River and play a major land drainage role as a flood water storage and conveyancing area and the washland is thus subject to flooding.

1.17 A winter storage agricultural irrigation reservoir lies at North Fen, Sutton Gault (south of the Block Fen / Langwood Fen area). This has been extended through additional mineral extraction. Planning permission has also been granted for the reservoir to be used for the storage of potable water.

1.18 There are also a number of smaller winter storage reservoirs in the wider Earith / Mepal area serving the irrigation needs of specific areas of agricultural cultivation.

Cultural and Historic Interest

1.19 In terms of cultural and historic interest the area contains no listed buildings. However, it is of high archaeological importance and includes a number of Scheduled Ancient Monuments. The area is known to contain prehistoric remains and there are extensive remains of Bronze Age, Iron Age and Roman settlements in the area, some of which may prove to be of national importance.

Access

1.20 The main traffic corridor is the A142 Ely - Chatteris Road, which bridges the Ouse Washes. The area is also crossed by Bury Lane leading from Sutton to Long North Fen Drove towards Chatteris. This route crosses the Washes by way of a causeway and is frequently obstructed by floodwater in the winter months.

1.21 The other roads in the area are minor lanes (droves) linking farms and byways. There are a limited number of public footpaths the most important of which from a recreation point of view are the linear paths which follow the banks of the Ouse Washes.

Existing Minerals and Waste Operations

1.22 The area is known to contain significant sand and gravel deposits having been the subject of some earlier extraction, and is currently the subject of active and planned mineral workings on a significant scale.

1.23 North of the A142 is Block Fen. This is a large area, already permitted for sand and gravel extraction, and currently operated as 2 quarries, a third is due to commence development in the short term. Access to Block Fen is via a roundabout off the A142. Current restoration proposals are for reinstatement to an agricultural use, at existing (using inert waste fill) or low level, with the incorporation of a few small water bodies and wetland habitats to complement the existing County Wildlife Site.

1.24 South of the A142 extraction has also been permitted for a smaller area at Sutton Gault. This was originally associated with the creation of a winter storage agricultural irrigation reservoir at North Fen. The original reservoir has been extended through subsequent planning permissions and extraction and construction works are taking place. Planning permission has also been granted for part of the reservoir capacity to be used for potable water supply.

1.25 Further south is extraction associated with the Somersham and Colne Fen Quarries. Access for both these quarries is off the B1050.

The Earith / Mepal Stakeholder Group

1.26 This Master Plan has been developed through a number of stakeholder workshops. These sessions have been vital in determining the nature of the proposals which have been come forward, and in providing technical supporting information and advice.

1.27 In addition a number of supporting studies have been undertaken which have addressed:

- hydrology
- sustainable use of soils
- Ecology
- traffic

1.28 The results of all these studies are published separately and are available on Cambridgeshire County Council's web site http://www.cambridgeshire.gov.uk

1.29 Participants have included the minerals and waste industry, the Environment Agency, the Middle Level Commission, the Sutton and Mepal Internal Drainage Board, the Royal Society for the Protection of Birds (RSPB), The Wildfowl and Wetlands Trust (WWT), Officers from the District Councils, and Natural England.

The Next Steps

1.30 This draft Master Plan is linked to its 'parent' plan 'The Cambridgeshire and Peterborough Minerals and Waste Plan Core Strategy'. It seeks to provide supplementary guidance on the implementation of proposals for the Block Fen / Langwood Fen area made in this Plan, principally through policies CS5 Earith Mepal and CS20 Inert Landfill.

1.31 In July 2009 the Cambridgeshire and Peterborough Minerals and Waste Plan will be submitted to the Secretary of State and considered by an independent Planning Inspector in November 2010. Following the examination of the proposals the Inspector will publish changes to the Minerals and Waste Plan which are binding, and which may also mean revisions to the supporting Master Plan. It is anticipated that the Minerals and Waste Plan Core Strategy will be adopted in June 2011.

1.32 This draft Master Plan is being published for public consultation for six weeks between XXX and XXXX. Comments are invited on the Master Plan. Responses will be considered (along side any changes to the parent Plan) before the Master Plan is finalised. It is anticipated that it will be adopted in June 2011.

2 The Vision

2.1 The vision for Block Fen / Langwood Fen area is:

- to undertake development in a planned and sustainable way, ensuring there is no adverse impact on the integrity of the Ouse Washes, taking into account the need to address climate change by incorporating into the proposals for this area such measures as recycling of waste to encourage the use secondary materials, water storage and transfer to address nature conservation, sustainable flood risk management, and water supply issues across the wider area, including the creation of new habitat which will enhance the Ouse Washes and will assist in conserving for the long term high quality peat soils, and active traffic management designed to influence lorry and other traffic movements to use appropriate routes

- a continuation in the role of the area as a major producer of sand and gravel, to 2026 and beyond. The sand and gravel being used largely to supply the construction industry in the delivery of planned growth i.e. houses, employment, schools, roads, and other supporting infrastructure in the Cambridge, and wider Cambridgeshire area. The focus for this development would be the Block Fen / Langwood Fen area, with operations at Earith and Somersham closing when current consents are worked

- the development of Block Fen and Langwood Fen as a strategic resource for the recycling of construction waste and for the disposal of inert waste that cannot be recycled. The latter largely comprising soils and sub soils arising from the planned development in Cambridgeshire

- an area with its close links to the neighbouring internationally important Ouse Washes being positively strengthened over the Plan period and beyond. Due to inappropriate water levels and water quality issues the Ouse Washes is currently in 'unfavourable' condition. The restoration of mineral void to high quality wet grassland adjacent to the Washes will provide enhancement habitat for the nationally and internationally important breeding and wintering bird populations currently using the Washes. Potentially this will be of particular value for breeding waders whose habitat might be flooded in the spring, and for some species of wintering duck who find water levels too deep, and flooding too extensive, for feeding purposes. This will be achieved by the disposal of inert waste in containment engineering with soils replaced to bring land back to original levels, and the sustainable use of peat soils to create lowland wet grassland. The new habitat will require active management in the long term, and this will be secured through planning obligations with the land being placed under the control of a suitably experienced and responsible conservation body. The Block Fen / Langwood Fen area will continue to be an important buffer area for the Ouse Washes, with the maintenance of a landscape which has few trees and hedges which could harbour predators

- an area which will make a growing contribution to the management of water in the Fenland area and which has a key role to play in the delivery of the Environment Agency's Cranbrook / Counter Drain Strategy, which seeks to secure sustainable flood risk management in this area. This will be achieved through the creation of a number of water storage bodies following mineral extraction. These water storage bodies will be used to store flood water, which would normally be pumped into the Ouse Washes. The water will be stored and used to supply the Middle Level and Sutton and Mepal Internal Drainage Board area with irrigation water, providing a significant water resource to farmers in a catchment area where there is a shortfall of water for summer irrigation of crops

- an area which will become an important recreational resource for this and a wider area, with the new water bodies contributing to formal recreation provision, with informal recreation opportunities associated with the new lowland wet grassland habitat, supported by a local visitor centre. Coupled with the following objective, this will increase access to the countryside, tourism and supplement the local economy
- an area with improved local navigation, specifically in relation to the Forty Foot where the provision of a clay wall will result in reduced water seepage out of the drain. Potential for restoration of enhanced navigation in this area will contribute to wider objectives such as those in the Fenland Waterways Link strategy

Objectives

2.2 The objectives for Block Fen / Langwood Fen area are:

- to enable the supply of at least 1.4 million tonnes of sand and gravel per annum from Block Fen / Langwood Fen from 2010 onwards to 2026 and beyond
- to establish at least 3 long term construction waste recycling facilities, capable of recycling up to 50%, increasing up to 70%, of construction waste by 2026
- to enable inert waste disposal of around 0.5 million cubic metres of inert waste from to 2011 onwards to 2026 and beyond
- to ensure there is no adverse impact to the Ouse Washes through the extraction, landfill and restoration of the Block Fen / Langwood Fen area, through well planned, designed and controlled working and restoration
- the creation of around 480 hectares of lowland wet grassland providing enhancement habitat to complement the Ouse Washes, using inert waste and peat soils to create the wet grassland
- to provide for the long term management of the enhancement habitat adjacent to the Ouse Washes
- the creation of water storage / supply bodies with capacity of 10 million m^3
- to set out a mechanism for the long term management of the water resource created
- to provide for new and enhanced recreational opportunities, including a local visitor centre
- to secure, through the creation of lowland wet grassland and the disposal of inert waste, the 'sealing' with clay of the southern boundary of the Forty Foot, enabling the restoration of navigation
- to secure the sustainable use of soils as a resource for the future
- to address traffic management in the area i.e. movements associated with the use of land for mineral extraction and waste management, and long term uses such as recreation

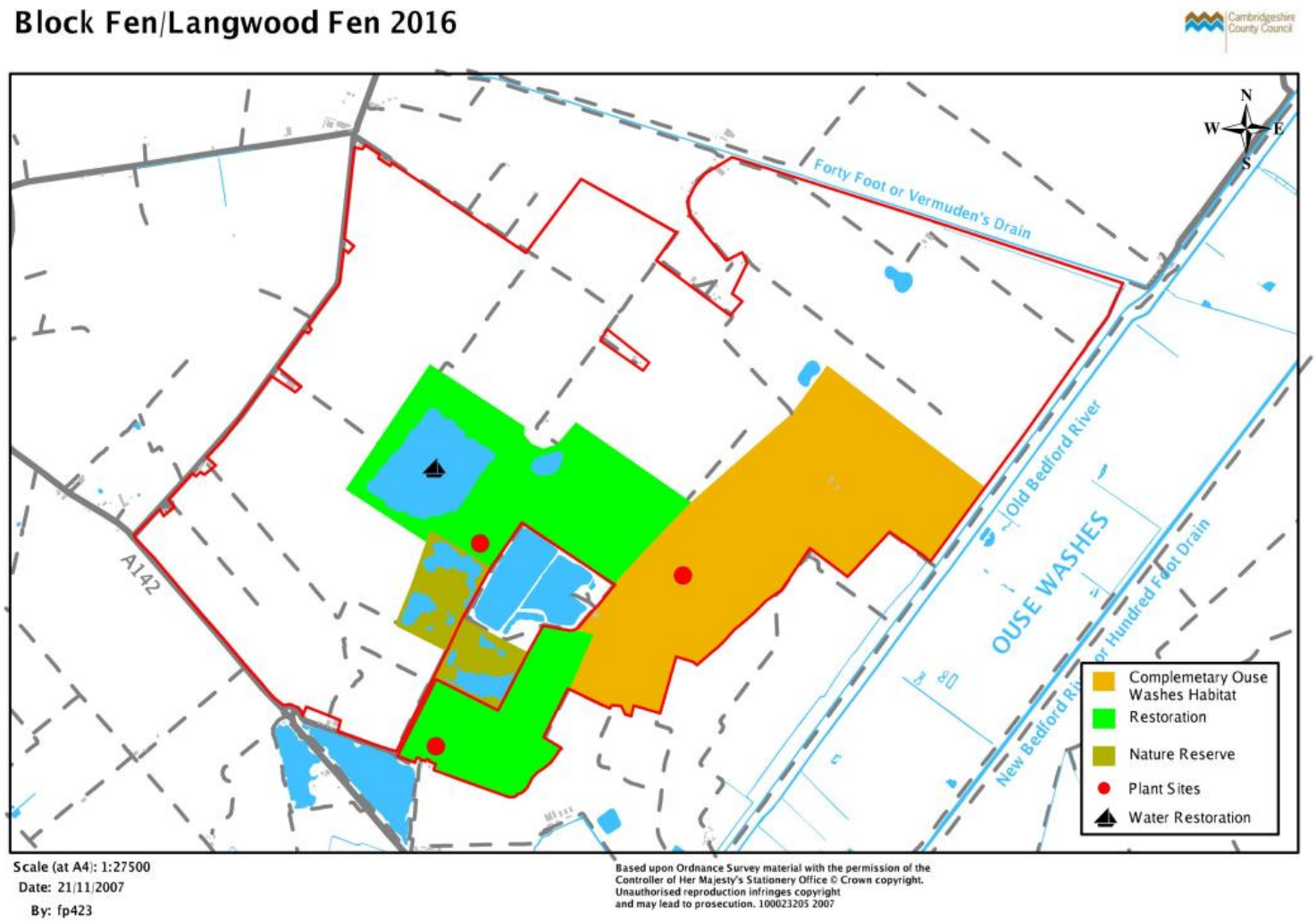
Delivering the Vision

2.3 Delivering the proposals of this Master Plan will require the co-operation of a number of parties, ranging from land owners and minerals and waste operators, to the 'responsible bodies' which will take over the long term management of restoration areas such as the new lowland wet grassland and the water storage bodies.

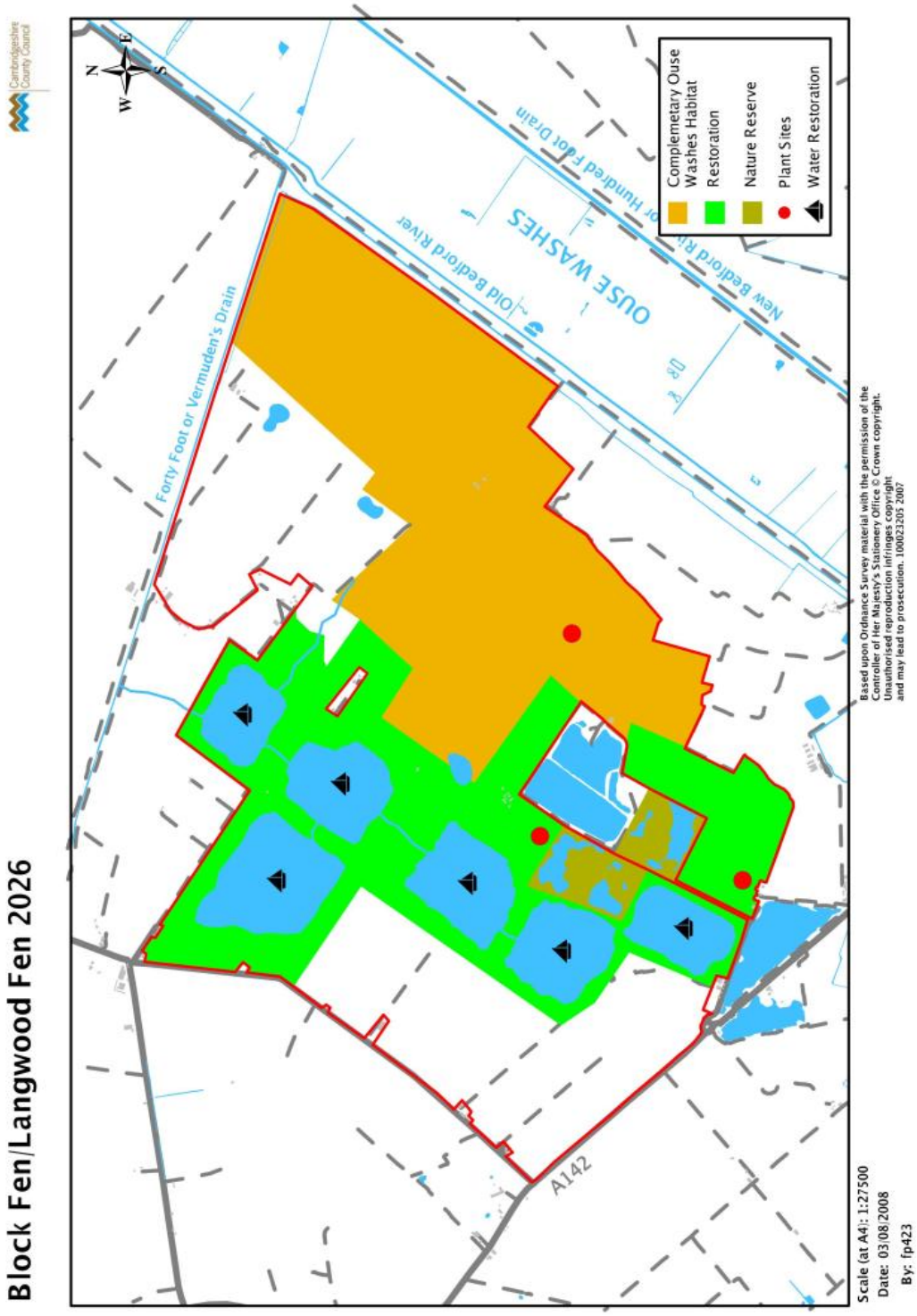
2.4 Stakeholders have already shown a high level of co-operation through their participation in the development of this Master Plan, and on a more practical level on the ground, through the joint delivery of the new Block Fen roundabout to serve new quarries.

2.5 This Master Plan sets the parameters for the delivery that will be required, and this will be achieved through a variety of more formal means such as the development control system (which determines planning applications), and associated legal agreements which can cover such matters as long term management arrangements and funding, which cannot be addressed through planning conditions.

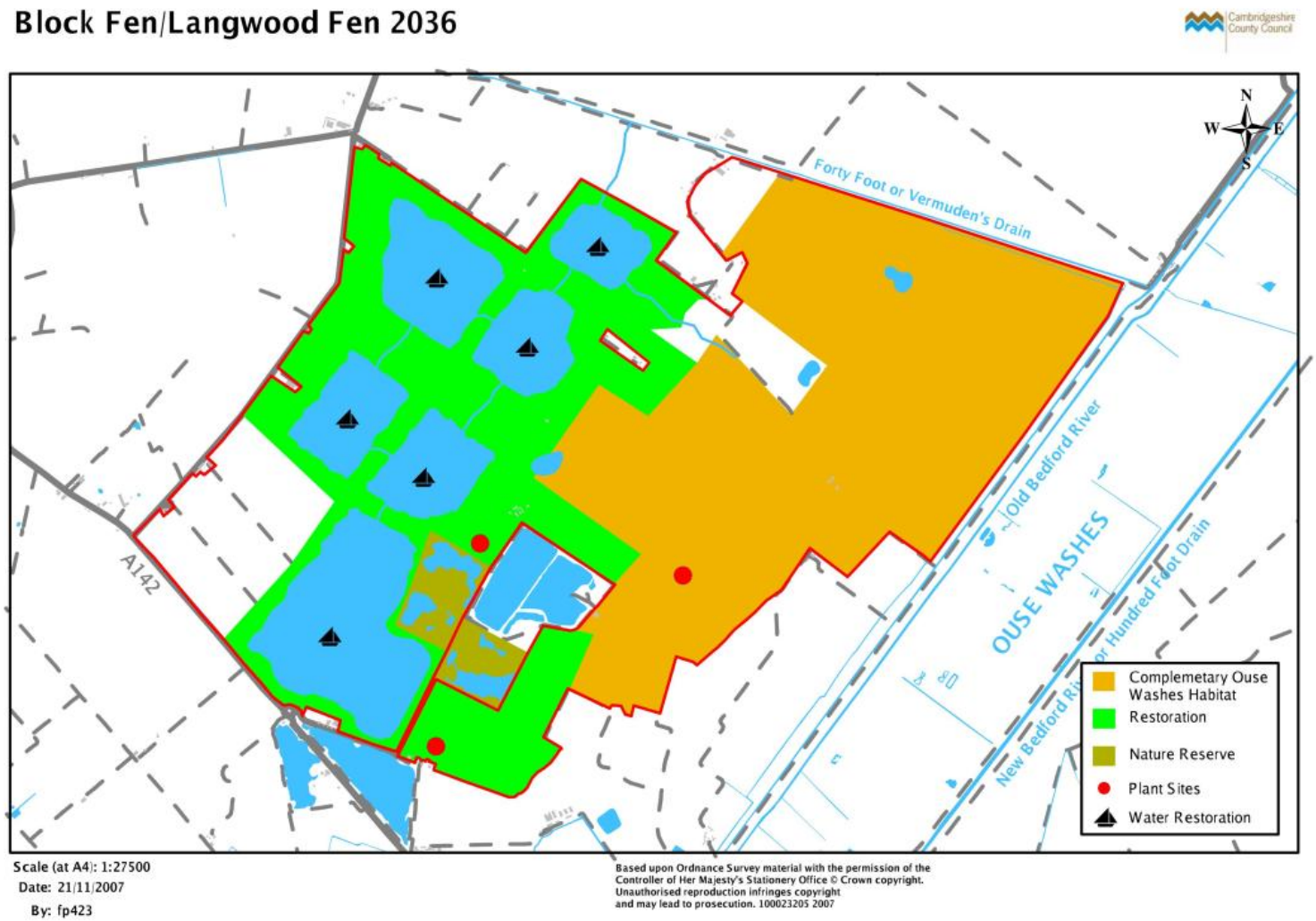
2.6 The vision for the development of the Block Fen / Langwood Fen area over the coming years is shown in the following four illustrative maps, with 'snap shots' of the development shown for 2016, 2026, 2036 and 2050 (See Map 2.1, Map 2.2, Map2.3, and Map 2.4).



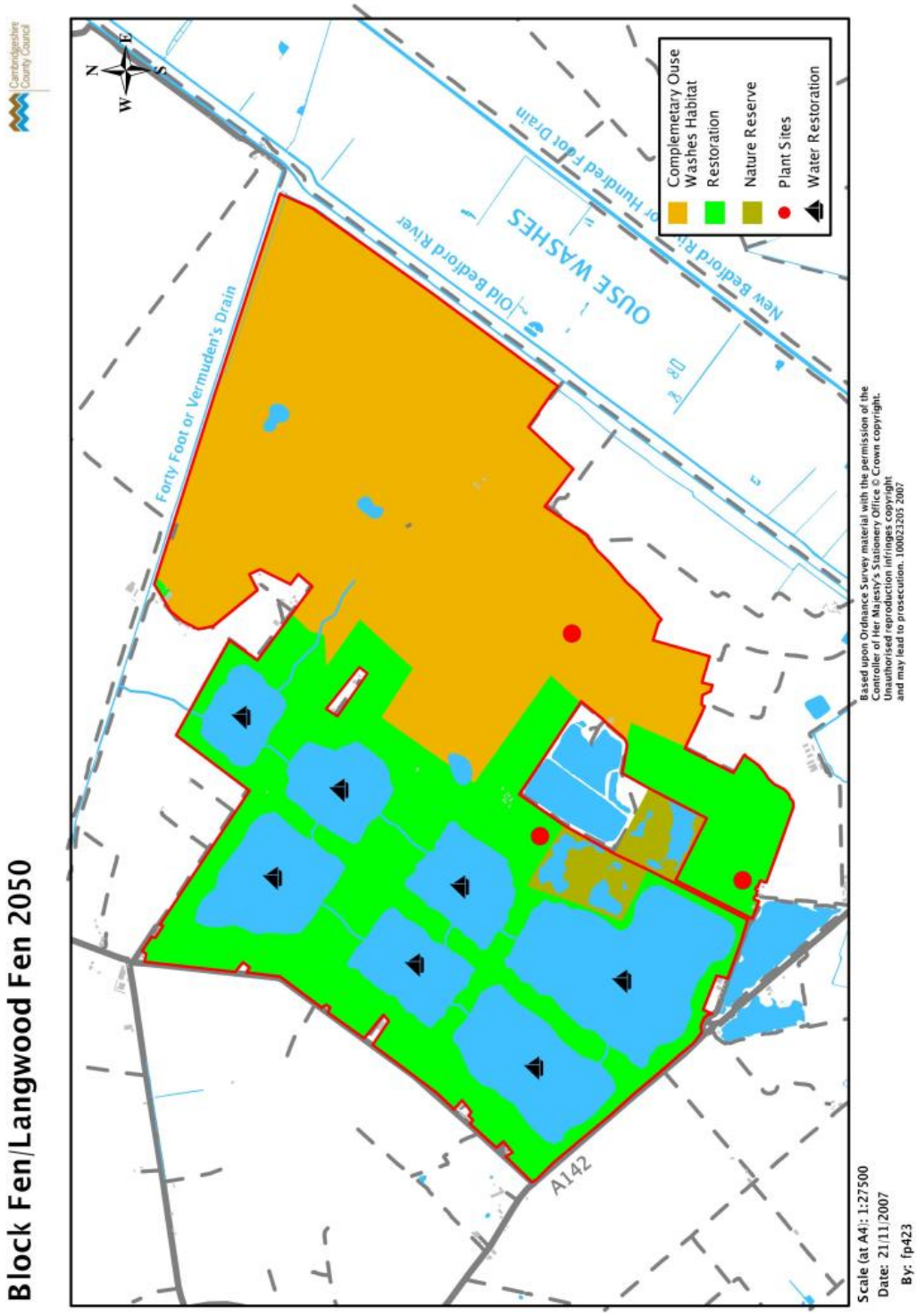
Map 2.1 Block Fen / Langwood Fen Master Plan 2016



Map 2.2 Block Fen / Langwood Fen Master Plan 2026



Map 2.3 Block Fen / Langwood Fen Master Plan 2036



Map 2.4 Block Fen / Langwood Fen Master Plan 2050

3 Phasing and Working of Reserves

The Need for Sand and Gravel

3.1 Substantial growth is planned for Cambridgeshire and Peterborough over the coming years. It is estimated that around 98,000 new houses, 95,000 new jobs, and supporting development such as schools, libraries and other services will be required. In addition major transport development will be taking place including the construction of the Cambridge – St Ives guided bus, improvements to the A14 and the A47.

3.2 All this new development requires raw materials. On average a house requires 60 tonnes of sand and gravel, and one kilometre of new dual carriageway requires 200,000 tonnes of sand and gravel.

3.3 With such demands in mind the Government has set out the amount of sand and gravel that must be supplied by the East of England Region over the coming years. This amount has been shared between all the mineral planning authorities in the Region. Cambridgeshire and Peterborough, who prepare their land use plans together, must provide a minimum of 2.8 million tonnes of sand and gravel each year for the foreseeable future. To provide some flexibility the Authorities are planning on the basis of 3.0 million tonnes per year which over the period we are planning for, which is 2006 to 2026, adds up to 60 million tonnes.

3.4 In addition Cambridgeshire and Peterborough are faced with a number of 'older' quarries in their area coming to the end of the reserves they are allowed to extract, and closing down. This poses a problem in terms of the loss of production units. It is estimated that by 2013 there will be shortfall of 'production capacity' which will rise to around half a million tonnes per annum by 2016, and which will increase to 1.8 million tonnes per annum by 2026 and beyond, if not addressed

3.5 In order to meet the forecast shortfall in supply some new sites, but primarily extensions to existing sites, are being identified for the future extraction of sand and gravel in the County.

The Location of Sand and Gravel Extraction

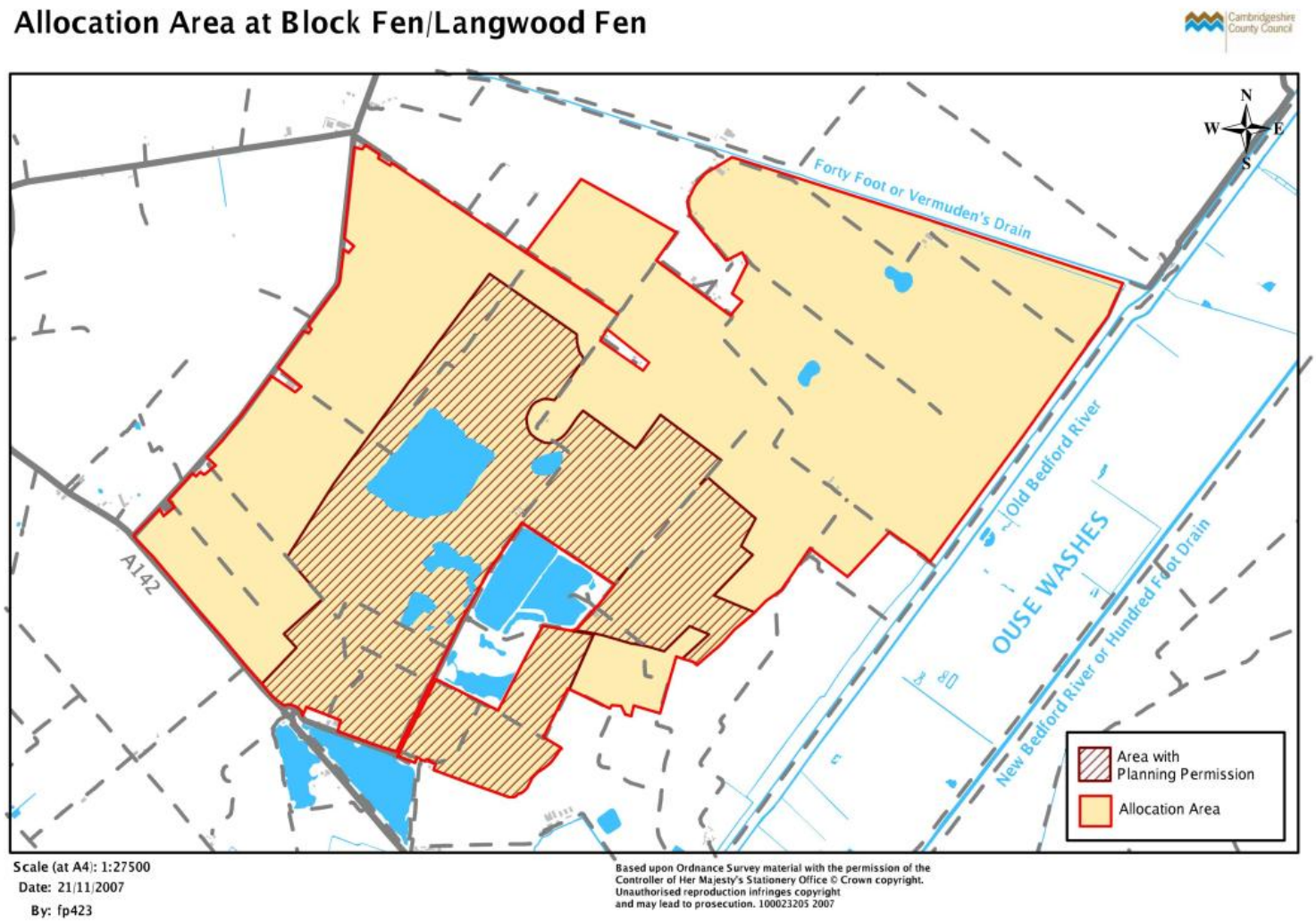
3.6 Block Fen and Langwood Fen is an area which has significant reserves of sand and gravel. Two quarries are already established and working, and a further quarry will in the short term. Together there is already permission to extract around 20 million tonnes of sand and gravel from this area.

3.7 Current proposals require the area to be restored to an agricultural after use, to existing ground level following infilling, either or to a lower level with secure arrangements for the pumping of surface water from sumps. These agreed schemes will need to be revisited and changed if the objectives of the Minerals and Waste Plan Core Strategy and this Master Plan are to be achieved.

3.8 It has been concluded through the Cambridgeshire and Peterborough Minerals and Waste Plan that the Block Fen / Langwood Fen area should be extended further to provide a strategic long term resource for the extraction of sand and gravel. The Core Strategy therefore allocates a further area of around 856 ha, with estimated reserves of 24 million tonnes.

3.9 Map 3.1 shows the areas of existing quarries, and the areas which are being allocated. In practice a buffer (within which mineral extraction will not take place) will be required from the edge of the Ouse Washes, Forty Foot, and A142 to support such engineering structures. This will be in the order of 150 metres from the toe of the bank.

3.10 In addition there are known archaeological interests in the allocated area, including ring ditch remains of Bronze Age burial mounds, remains of an Iron Age settlement, and undated crop marks of probable prehistoric origin. Full archaeological investigations will be required to accompany any planning application. The most important area of archeological interest is on the western edge of the site, adjacent Langwood Fen Drove. The results of the archaeological investigations will determine what mitigation measures may be required and if the detailed extraction area needs to be modified.



Picture 3.1 Block Fen / Langwood Fen Allocation Areas

Phasing and Working of Reserves

3.11 In order to help address the forecast shortfall in the supply of sand and gravel, the Block Fen / Langwood Fen area needs to produce 1.4 million tonnes of sand and gravel each year from 2012 onwards.

3.12 The allocation that is made by the Minerals and Waste Plan Core Strategy has been shaped by a number of considerations, including the unique proposed after uses. This comprehensive approach has led to a significant area being allocated, one which will help to provide for our sand and gravel needs to 2026 and beyond.

3.13 We need to manage the extraction of this sand and gravel carefully and to husband this important resource. This will be achieved through 'phasing' i.e. the planned gradual working of reserves. Phasing will ensure that material is not released unnecessarily, but that there is a continuous supply to meet our needs, whilst securing the progressive restoration of the worked out areas.

3.14 The total reserve for the new allocations in the Block Fen / Langwood Fen area is estimated at just over 24 million tonnes. The amount of the new allocation that will be extracted during the period to 2026 will be around 10 million tonnes, which means the balance of around 14 million tonnes will be extracted after 2026.

3.15 It is acknowledged that allocations of this magnitude are not common, particularly where a substantial amount of the provision is being made for the post 2026 period. This situation has come about through recognition of the unique contribution that quarry restoration in this area can make i.e. in the creation of enhancement habitat for the Ouse Washes and more sustainable flood risk management for the Cranbrook / Counter Drain catchment. Together these can play a significant role in enhancing the Ouse Washes SSSI as is required of the Council under duties in the Countryside and Rights of Way Act 2000 and delivery of the Environment Agency's adopted Cranbrook / Counter Drain Strategy. In order to deliver these important wider objectives a comprehensive and long term approach has to be taken.

3.16 It is also necessary to provide the minerals industry and land owners with a clear long term strategy, with greater certainty regarding the development of the area, especially given the need to change the agreed restoration proposals of existing quarries.

3.17 The reserves in the Block Fen / Langwood Fen area are known to be of good quality, and in terms of depth vary from around 4 metres in the eastern side of the site, to around 8 metres in the west. This fits in well with restoration proposals where the deeper void created by extraction in western side of the site will be used on for water storage, and the shallower eastern area will be used for the creation of extensive lowland wet grassland habitat to complement the Ouse Washes.

3.18 In order to help to control the release of the sand and gravel three 'production areas' have been defined, each with a production unit. These in part reflect the location of the existing quarry operations, but also have had regard to the following:

- three production units / production areas are sufficient to meet the forecast need for sand and gravel from the Earith / Mepal area
- the need to consider the deliverability of proposals by taking into account known land ownership and land options
- that all access must be taken from the existing Block Fen roundabout
- the need to reconsider and change existing restoration proposals in the context of the wider proposals of the Minerals and Waste Plan Core Strategy

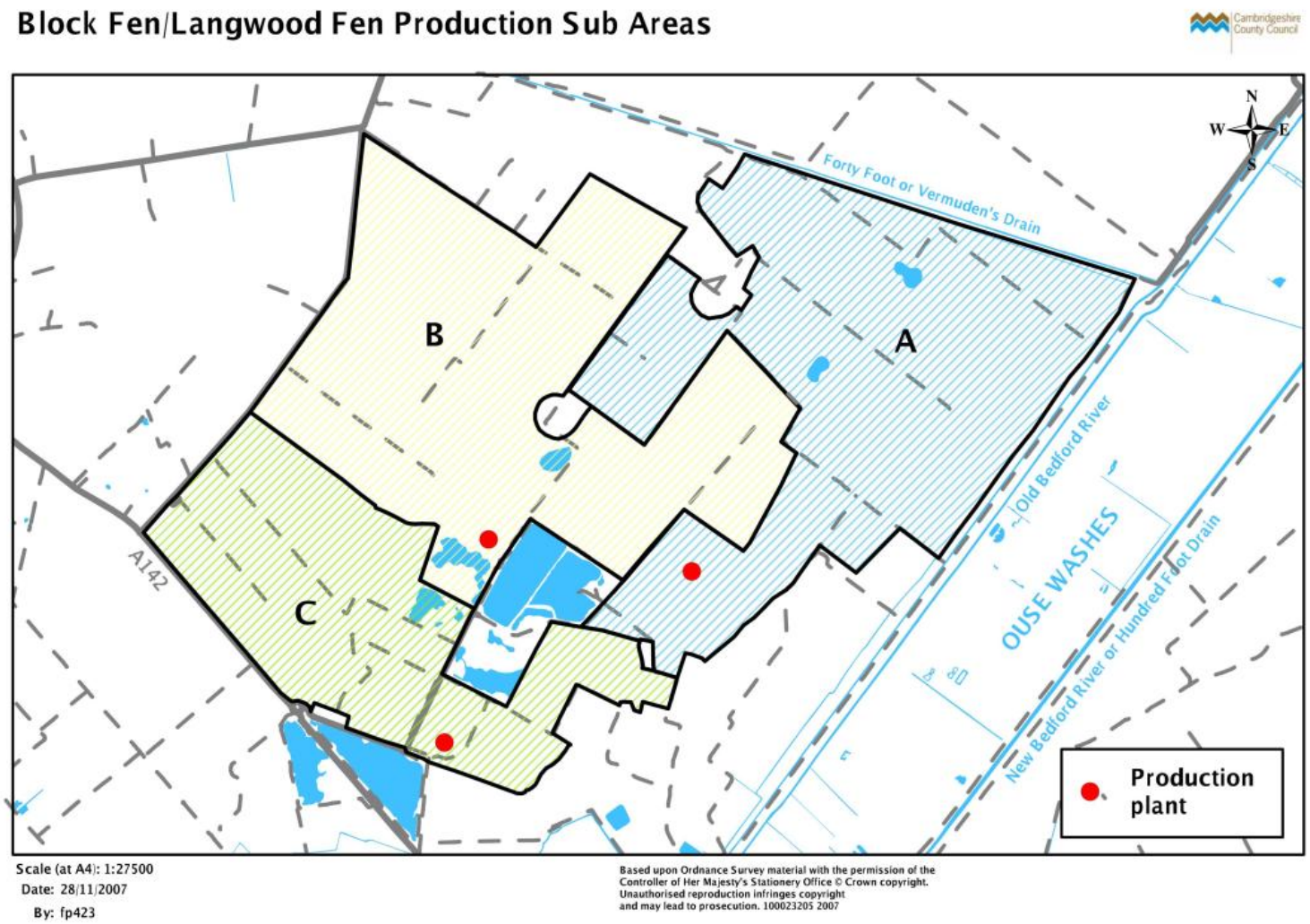
3.19 Map3.2 shows the three Production Areas, and a breakdown for the working of reserves for each is set out in the table below:

Table 3.1 Phasing for Working of Reserves

Production Area	Existing Permitted Reserves	Working of new allocations 2006 to 2026	Working of new allocations post 2026
Area A	0.9	6.5	4.9
Area B	9.7	3.2	5.5
Area C	9.6	0.0	4.0
Total	20.2	9.7	14.4

3.20 The working of each production area must reflect the above phasing for the working of reserves. Planning applications must provide a detailed phasing diagram showing how the mineral will be worked and how the site will be progressively restored to the planned after uses. A list of requirements for planning application is set out in Appendix 3. Block Fen / Langwood Fen acts as a buffer for the Ouse Washes because it supports very few potential predators which may harm ground nesting birds, any phasing and restoration proposals will need to recognise this and ensure that the role of the area in this respect is not compromised.

3.21 The forecast production capacity of these areas confirms that the Block Fen / Langwood Fen area will be producing just over 1 million tonnes per annum by 2009, with additional flexibility added as this rises to a production capacity of 1.4 million tonnes per annum by 2011 through to 2026 and beyond.



Map 3.1 Block Fen / Langwood Fen Production Areas

4 Waste Recycling and Disposal

The Need for Waste Recycling and Disposal

4.1 Over the coming years the construction of new housing and other development is going to give rise to a significant amount of material such as soils, sub soils, bricks, concrete, and other construction and demolition waste. These materials are often called 'inert' materials, which mean that they do not readily decompose or rot when disposed of. Although they are called 'waste' because they are not needed at the place where the development is taking place, these materials are actually a valuable resource which needs to be managed in a sustainable way.

4.2 It is possible to recycle construction and demolition materials by separating, crushing, grading and sometimes washing them, so they can be re-used for new construction purposes. There are also opportunities to blend materials to meet specific requirements. This reduces the amount of virgin sand and gravel and other materials that are required, helping to conserve a valuable resource.

4.3 In Cambridgeshire and Peterborough it has been forecast that just over 61 million tonnes of construction and demolition waste will need to be managed between 2006 and 2026. We expect to recycle at least 50% of this waste.

4.4 Of the remaining 30million tonnes that cannot be recycled, around 20% of that material will not be inert and will need to be recycled or disposed of at other specialised facilities and locations. This leaves around 24 million of tonnes of inert waste to be disposed of in Cambridgeshire and Peterborough.

4.5 In order to achieve our recycling rates we need more recycling facilities. Inert recycling facilities are often located at quarries and landfill sites because they can normally be accommodated without detriment to the environment or local communities. In addition there are opportunities to build upon synergies between the different activities on site e.g. landfill sites offer a place to dispose of the materials that cannot be recycled, virgin and recycled materials can be blended as necessary, and traffic movements can be reduced by 'backloading' lorries, so they bring in one type of material and take out another.

4.6 The need for places to dispose of the inert waste that cannot be recycled is also pressing. There is already as shortage of sites and changes to national policy, which now requires landfill sites to be in areas where there is no risk of prejudicing any underground water resources i.e. aquifers. Aquifers providing drinking water cover extensive areas of land in south Cambridgeshire and thus landfill sties will be harder to find in the future. Areas having underlying clay are likely to be more favourable locations for landfill disposal sites.

4.7 It is forecast that over the period from 2006 to 2026 over 9 million cubic metres of landfill space for inert waste will be needed in Cambridgeshire and Peterborough.

The Location and Level of Inert Recycling

4.8 Each of the sub-areas for mineral extraction will contribute to inert waste recycling by incorporating a facility for this purpose. (See Map 3.2 Block Fen / Langwood Fen Production Areas).

4.9 It is anticipated that the highest level of inert recycling will take place in sub-area 1 because this is the area where the majority of inert waste disposal will take place, which will help to form the enhancement habitat to complement the adjacent Ouse Washes. In this area capacity to recycle around200,000 tonnes per year will be created.

4.10 The other two facilities, in sub-areas 2 and 3 will make a lesser but still important contribution to recycling inert waste, in the order of around 40,000 tonnes per annum each.

4.11 In all cases the life of the inert recycling facilities will be limited to the life of the mineral operation and the associated restoration proposals.

The Location and Level of Waste Disposal

4.12 The amount of space that will be created for the disposal of construction waste (principally inert waste) is linked to the location and depth of the sand and gravel extraction that will take place in the sub areas, and the restoration proposals to return the land to new lowland wet grassland adjacent to the Ouse Washes, or to agricultural land around the water storage areas.

4.13 The methodology for the creation of new lowland wet grassland uses inert materials to fill the void created by mineral extraction, and to return it back to its previous level (see Section 5: 5 'Enhancement Habitat ').

4.14 In total around 480 hectares of land will be returned to lowland wet grassland and land around the water storage bodies will be returned to ground level, both creating capacity for the disposal of construction waste. It is estimated that 14 million cubic metres of void will be created, which will take around 21 million tonnes of inert waste. The table below shows the timescale for the creation of void and disposal of construction waste. This will make a significant contribution to addressing the need outlined above.

Table 4.1 Provision for disposal of construction waste

Timescale	2011 to 2026	2026 to 2036	Total 2011 to 2036
Waste Disposal Capacity	12.6 million tonnes capacity / 8.4 million m3 of voidspace	8.4 million tonnes capacity / 5.6 million m3 voidspace	21 million tonnes capacity / 14 million m3 of voidspace

5 Enhancement Habitat

Enhancement Habitat for the Ouse Washes

5.1 The Block Fen / Langwood Fen area lies immediately adjacent to the Ouse Washes. The nature conservation importance of this extensive area of seasonally flooded washland and wet grassland has been recognised by national (SSSI), European (SPA and SAC), and international (Ramsar site) protective designations.

5.2 The Washes plays host to important populations of breeding and wintering birds, including nationally important numbers of the Western European / West African breeding population of black-tailed godwit along with other breeding wader species such as snipe and redshank. Since the 1970's there has been a deterioration in the quality and quantity of wet grassland habitat, mirrored by declines in numbers of breeding waders and some winter duck species such as wigeon. This deterioration has been largely attributed to an increase in the frequency of spring and summer flooding events along with increased depth and duration of floods, although nutrient enrichment from the water entering the site is also a contributory factor. The site is therefore in 'Unfavourable' condition and as been entered on the Montreux Record as a 'failing' Ramsar.

Picture 5.1 Black Tailed Godwit (Courtesy of RSPB)

Picture 5.2 Lapwing (Courtesy of RSPB)

5.3 Through European legislation, the UK Government has a responsibility to address the deterioration on the Ouse Washes. As a result, it set up the Ouse Washes Steering Group comprising members from Defra, Natural England (then English Nature), the Environment Agency, and the RSPB to consider solutions to address the problems. Such solutions included considerations of water quality, improving drainage of water exiting the Washes and the option of creating replacement habitat off-site.

5.4 As a result, the Ouse Washes Habitat Replacement Project was born and is led by the Environment Agency. The aim of the Project is to create 1008 hectares of high quality lowland wet grassland near to the Ouse Washes by 2014 and is currently in the land acquisition phase.

5.5 The creation of new wet grassland following mineral extraction will enhance the Ouse Washes by providing alternative suitable habitat for breeding ground nesting waders and wintering wigeon to use when water levels are too deep or flooding too extensive on the Ouse Washes.

5.6 In order for any new enhancement habitat to be successful in attracting the species of birds which would normally nest on the Ouse Washes, it needs to be as close as possible, and ideally be immediately adjacent to the Ouse Washes. This requirement limits the geographical area that could potentially host new lowland wet grassland, and helps to makes the Block Fen / Langwood Fen area a prime location.

5.7 At another level, broad regional biodiversity targets are included within the Regional Spatial Strategy (RSS). These include the creation of 2000 hectares of reedbed and fen along with around 2000 hectares of lowland grassland and heath. These filter down to County level and the local Biodiversity Action Plan, which details targets and actions for more specific wetland habitats such as lowland wet grassland.

5.8 Mineral and waste planning authorities including Cambridgeshire and Peterborough also have obligations to further the conservation and enhancement of national Sites of Special Scientific Interest, which includes the Ouse Washes.

5.9 The creation of enhancement habitat delivered through minerals extraction and subsequent restoration will be outside the scope of the Government's current Public Service Agreement target (PSA target) of 95% of SSSIs by area to be in Favourable or Unfavourable Recovering condition by 2010. This is because it will be delivered after this timescale and the new habitat is unlikely initially to fulfil the necessary criteria to be immediately notified as a SSSI. Over the longer term, the storage water bodies may have the potential to address some of the water level problems on the Washes. The creation of lowland wet grassland habitat in this vicinity will undoubtedly be of enhancement value to the Ouse Washes and is directly linked to the special interest features of the site. It will contribute significantly to other regional and local targets, including regional and local Biodiversity Action Plan targets. It will also complement the development of the Great Ouse Wetland which recognises that within a mix of ownerships, a major wetland complex extending over 2000 hectares and 22 miles alongside the Great Ouse already exists. Additional land will provide new access and promotional opportunities.

The Location of the Enhancement Habitat

5.10 As already noted any enhancement habitat must be located close to, and ideally immediately adjacent, to the Ouse Washes. When the creation of such habitat is being delivered through sand and gravel extraction its possible location is also influenced by the distribution of sand and gravel reserves. Fortunately in the Block Fen / Langwood Fen area economic sand and gravel reserves abut the Ouse Washes, which means the site offers a perfect location for the creation of new lowland wet grassland. The Block Fen / Langwood Fen site is also directly opposite Coveney which is a priority area for the Environment Agency's Habitat Creation Project. If both these areas were to be developed, they would complement each other and provide significant added value through the increased area of contiguous wetland.

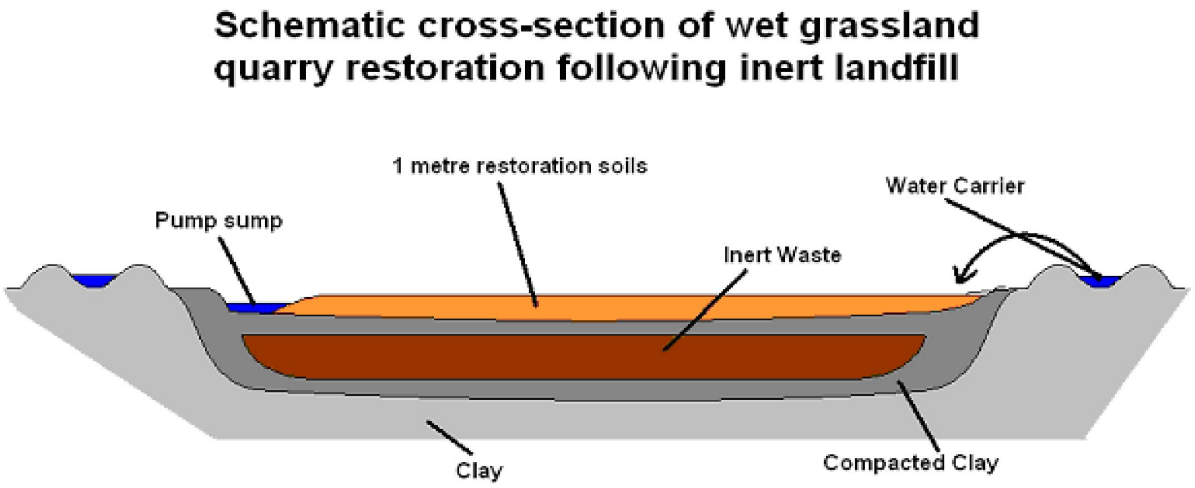
5.11 The area where wet grassland will be created following mineral extraction is shown on Map 4. This totals around 480 hectares in the east and north east sector of the Block Fen / Langwood Fen area.

Methodology for Creating Enhancement Habitat

5.12 A methodology for the creation of lowland wet grassland has been drawn up and is set out in 13 'Appendix 3'.

5.13 However, in brief, following the extraction of the sand and gavel the base and sides of the void will be lined with compacted clay to an agreed specification, and filled with inert waste which will raise the land towards to its previous level. The inert waste will then be sealed in also using compacted clay. A 'cell' containing the waste will thus be formed. Subsoils will be placed on top of this cell, with peat forming the top layer to return to original contours. These soils will support the lowland wet grassland which will be created, and the water levels will be controlled by water carrying channels at the edge of the cell and a sump. This will enable the environment to be controlled and the grassland to be wetted and drained as required.

5.14 A schematic cross section of a wet grassland area is provided below:



Picture 5.3 Schematic Cross-Sectional Diagram

5.15 As mineral extraction is taking place over a long period of time the extraction of sand and gravel and the creation of lowland wet grassland will be done on a phased basis. There will therefore be a number of wet grassland cells created. Any planning application will be required to set out details of phasing and the location and extent of cells and arrangements for water supply and removal. Given the amount of inert waste that is arising in the future, and the difficulty of finding suitable places for its disposal, the formation of the lowland wet grassland is unlikely to be limited by the availability of the fill material.

5.16 The habitat that will be created will require careful management in terms of the flows and availability of water. The waders for which the wet grassland will be created feed on invertebrates below the soil surface by probing the soil which needs to be kept moist through the spring until early June. High water tables also increase the number of invertebrates near the soil surface.

5.17 The wet grassland features, which are made up of surface scrapes, foot drains and furrows will therefore need a supply of water to replenish them during the winter period, so optimum water levels can be reached by the end of March or earlier if required. Water levels will then need to be maintained in these ground features during the early part of the breeding season, and allowed to fall towards the end of the season.

5.18 In order to achieve the particular conditions needed by the lowland wet grassland and its birds, a dedicated water supply will be required so the water environment can be managed. This water will be provided by two existing irrigation reservoirs in the Block Fen area, and supplemented if required by water from the larger water storage bodies that will be formed elsewhere on the site (see Map 2.4). It is estimated that the supplementary water needs of the wet grassland are between 590,000 m3 in an average year, and the site will need to have the capacity to deliver up to 810,000 m3 in a drier year. These figures will also need to take account of climate change predictions.

5.19 The methodology for the grassland cells also includes the creation of sumps for pumping water off the grassland area should this be necessary.

Block Fen Pilot Project

5.20 One of the quarries, which is currently extracting sand and gravel at Witcham Meadlands at Block Fen, is shortly to begin restoration. At present the agreed restoration scheme is to return the land back to an agricultural afteruse, but as this has not started there has been an opportunity to amend the restoration proposal to allow a trail area of lowland wet grassland to be created.

5.21 The trial restoration involves Aggregate Industries, Mick George Limited and the RSPB. All are using their respective experience and expertise to follow the methodology and create about 10 hectares of lowland wet grassland. Whilst this area is too small to attract significant populations of nesting bird populations, it provides a valuable opportunity to inform the methodology in terms of its design, implementation (including hydrological characteristics), and management needs of the habitat.

5.22 The first 5 ha trial area of habitat creation was completed in the Autumn 2008 with Aggregates Industries working closely with the RSPB. Following gravel extraction, inert fill, and clay capping the stockpiled, subsoil and topsoil were placed bring the finished site level back to the original field level. A specialist grass seed mix suitable for wet grassland habitat was sown, with good germination being achieved. Specialist machinery created "Dutch polder style surface furrows" along with a shallow pool scrape. Water control infrastructure has been installed along with dipwells, to monitor water levels. Lessons have been learned, all of which can be implemented on the next phase of works, these include using more accurate methods to level soils and minimising compaction of the subsoil. The vegetation structure is developing and grazing will be introduced in 2010, and invertebrate populations are being monitored and will develop as the wetland becomes established. The early conclusions are encouraging and show that conditions suitable for breeding wading birds are being created.

Long Term Management of the Enhancement Habitat

5.23 The creation of the new substantial area of lowland wet grassland is a vital part of the Block Fen / Langwood Fen vision, and one which acts on the excellent opportunity to provide enhancement opportunities for the special interest features of the Ouse Washes, which will supplement other work being undertaken by the Environment Agency and others. Over the long term, it may play a part in achieving and maintaining favourable condition on the Washes. Securing appropriate long term management of the area by a competent body is critical, and will form an essential part of planning obligations associated with any grant of planning permission.

Picture 5.4 Ouse Washes (Courtesy of RSPB)

5.24 The lowland wet grassland will therefore be passed to an appropriate body with experience of managing such special grassland, and this body will take over the long term management and regular monitoring of the land. Given that the extraction of sand and gravel in this part of the site and its restoration to lowland wet grassland will not be complete until around 2048, this will be done a phased basis.

5.25 The details of this arrangement will be secured through a legal agreement between the relevant parties involved, including the mineral and waste operators, land owners, and relevant competent bodies (drainage and nature conservation). This agreement must be in place before any planning permission will be granted.

6 Water Storage

The Need for Irrigation Water

6.1 The Block Fen / Langwood Fen area lies in the 'Middle Level' area which extends to around 70,000 hectares, much of which lies below sea level. The area is largely fenland, and being reclaimed land has a long history of being artificially controlled through man made drainage schemes. The most extensive of which is the Old and New Bedford Rivers between Earith and Denver, constructed by the Dutch engineer Cornelius Vermuyden.

6.2 The Middle Level Commissioners are now responsible for land drainage in the area which lies between the River Nene to the north west and the Great Ouse (Old Bedford River) to the east, and which is bounded by low clay hills to the south and west and by the marine silts of Marshland to the north. The area is divided into 39 Internal Drainage Districts and is served by a large number of pumping stations.

6.3 With the area having some of the highest quality soils in the Country, the main use of land is for agricultural purposes. The Fens produce a wide range of flowers, fruit and vegetables, including potatoes, carrots, sugar beet and salad vegetables.

6.4 The Regional Spatial Strategy identifies a need for more sustainable use of water resources, and encourages the development of winter water storage schemes. This involves water being caught and stored in the winter, and used in the summer as spray irrigation water. The advantage of such a water supply is two fold. Firstly it enables the continued production of good quality crops, and secondly it helps to prevent the erosion of the peaty soils by keeping them moist and stopping them from becoming dried out and being 'blown away' by the wind.

6.5 The use of water for irrigation purposes is regulated by the Environment Agency through abstraction licenses, these allow farmers to use a certain amount of water for irrigation purposes. The peak period of demand for water extends from around mid June and through July, which often coincides with 'drought' conditions. In the Middle Level area licenses are in place, which allow the abstraction of water. If available licenses permit up to 140,000 m3 of water per day can enter the Middle Level area from the River Nene at Stanground.

6.6 However, there are also times during the summer when, despite abstraction licenses and other measure being in place, abstraction of water is restricted e.g. to night time, or 4 days a week, and there is a shortfall of available water for agricultural irrigation purposes.

The Need for Flood Water Storage

6.7 Climate change is increasing river flows and giving rise to the potential for more frequent flooding. Water storage areas are vitally important as they offer the capacity to hold floodwater and release it when river levels have dropped. However, where circumstances allow the water can also be used for other purposes including water supply for summer irrigation.

6.8 The Environment Agency in their approved Cranbrook Drain / Counter Drain (Welches Dam) Strategy Study, has considered the long term management of the Cranbrook / Counter Drain catchment, which is an area lying west of the Counter Drain. As part of this review they have suggested that their preferred option is the creation of flood storage capacity through one or more water bodies. These would store flood water which would otherwise be pumped into the Ouse Washes, thereby helping to secure a more sustainable way to manage flood risk.

6.9 The creation of water storage bodies could also provide a significant contribution in finding a solution to addressing the future of the Welches Dam which is in need of replacement in the medium to long term i.e. in the next 6 to 25 years.

6.10 The Environment Agency is seeking to maintain a flood risk of 1 in 25 years, so is looking for any water storage body to accommodate around 10.8 million m3. This accounts for a 20% increase in flows over 100 years of climate change.

6.11 The Block Fen / Langwood Fen area could contribute significantly to this scheme. Water from the Counter Drain could be transferred into the reservoirs either via the Forty Foot or by a parallel channel. If water transfer was to be achieved via the Forty Foot these leakage control measures would be required which could be addressed through quarry engineering.

The Location and Creation of Water Storage Bodies

6.12 The location of the water body is important. Having a large expanse of water too close to the Ouse Washes will attract predatory birds such as Herring and Lesser Black-backed gulls, which will eat the eggs and chicks of the ground nesting birds that breed on the Ouse Washes. Yet too far away and the costs and feasibility of removing flood water from the Counter Drain become impractical. Equally the water storage body needs to be well placed to capture winter water for irrigation and to feed it into the wider carrier drainage system for farmers to use in the summer.

6.13 The extraction of sand and gravel in the Block Fen / Langwood Fen area will create voidspace which offers the opportunity for the creation of water storage bodies. The deepest sand and gravel on the site lies in the western side, reaching a depth of around 8 metres. The sand and gravel is underlain by stiff blue clay, which provides a suitable material for lining the void and 'sealing' the new water bodies from the hydrology of the surrounding area.

6.14 Fortunately the western side of the site also meets the criteria for a good location for the water bodies:

- it is far enough away from the ground nesting birds on the Ouse washes
- it is close enough to enable water transfer from the Counter Drain to the water storage body during times of unseasonal flooding
- it is well placed to intercept water which would normally enter the Counter Drain via the MepalPumping Station, and close to the Horseway Lock on the Forty Foot so water can be transferred into the Middle Level at its highest point, enabling it to supply the whole catchment area with irrigation water
- it is close to Welches Dam Pumping Station which pumps water into the Ouse Washes when necessary
- it is well placed to manage the interface between the water bodies and the new lowland wet grassland habitat

6.15 The amount of water storage space that will be created is influenced by the form and number of the lakes that will be created. It is possible to form one very large water body, but whilst this may provide more storage capacity in the long term it also poses problems in terms of delivery, as different landowners and mineral operators are involved, and they will be extracting over different timescales. Equally in terms of design a large water body may be more prone to wave erosion and will require additional maintenance. Having this in mind the water storage will be provided by a number of smaller lakes. Whilst these may appear to be separate, these will be engineered so they are hydrologically linked, enabling water storage to undertaken in a strategic way.

6.16 It is proposed that six or more smaller water bodies will be formed, giving around 10 million m3 of water storage capacity. This water bodies will be created in a phased way, corresponding to the timing for mineral extraction, with progressive restoration taking place. This should give rise to the following capacity:

Table 6.1 Creation of Water Storage / Supply Capacity

Year	2016	2024	2036	2050

Cumulative water storage capacity million m3	1.1	4.4	8.0	10.0

6.17 The above table reflects the total capacity of the water storage bodies, but to safeguard the engineering some water will need to be kept in them at all times, and there will be a 'rest level'. If there is a rest level of between 0.5 to 1.0 metres, the volume available for storing external water is between 6 million m3 in an average year, increasing to 7 million m3 in a dry year.

6.18 The water that would be transferred to the water storage bodies would largely be from the Counter Drain. However, the water storage bodies could also intercept and capture some of the water that which would normally go to the Mepal Pumping Station, and then into the Counter Drain system. The records of the Mepal Pumping Station show that it would normally pump around 7.5 million m3 in a wet year, and around 5.5 million m3 in a drier year. Intercepting water before it reaches the pumping station would reduce pumping requirements, and associated costs.

6.19 In addition water would be captured by the water storage bodies through direct rainfall and any excess water coming from natural habitats. This could be in the order of between 1 and 2 million m3 per year.

6.20 After taking into account the water requirements of the natural habitats that will be on site, it is estimated that the water storage bodies could supply around 6.25 million m3 of water to the external area in a dry year, and 6.75 million m3 in an average year. This would make a significant contribution towards meeting the irrigation needs in the immediate and wider area, and can reduce the amount of water that enters the Ouse Washes system when they have capacity to accommodate it.

6.21 The Environment Agency is also considering an alternative to the current proposed land restoration plans, which has potential to be a more sustainable restoration approach to Flood Risk Management within the Counter Drain system.

6.22 The alternative approach would be to return finished ground levels following extraction to match the lowest areas of the adjacent IDB district. The purpose of this final restoration level is to link the drainage of the flood storage area to the IDB drainage network to reduce, or if possible eliminate, the requirement for pumping systems to maintain suitable drainage conditions for continued afteruse and for evacuating stored flood waters. Linking groundwater levels within the storage area with the surrounding IDB system may also reduce or eliminate the requirement for clay lining, or other similar impermeable barrier, of the storage area.

6.23 The Agency would also seek to include a number of lakes within the restoration of the site. These lakes would again be maintained in continuity with the IDB system to provide a storage volume for flood events. The purpose of this would be to contain more frequent flood events, say 1 in 5 year to 1 in 10 year flood return periods, within the lakes. For the less frequent events there would be some over topping of the lakes within a defined and contained area. However, due to the infrequency of these events it is expected that the remaining land can have other uses i.e. complementary grassland.

6.24 During the larger, less frequent events there may be a requirement for containment embankments to provide the additional storage above existing ground level.

6.25 A detailed hydrological study is to be undertaken by the Environment Agency. This will help to determine the most appropriate option to provide flood management.

Landscaping

6.26 The form of the landscaping for the margins of the water storage areas is important. The margins of the lakes will fall within the buffer area of the lowland wet grassland and therefore must be complementary in its nature. The long term management regime must be appropriate, and should preferably be dry grazed grassland.

6.27 The land must also retain its open character, with minimal trees and hedges. Such features can host predators such as corvids and foxes which would eat the ground nesting birds (and their eggs) occupying both the Ouse Washes, and the newly created lowland wet grassland.

6.28 Managing the area in the way set out above will preserve the existing open landscape character of the Fens, and will increase the ecological value of the new lowland wet grassland.

Long Term Management of the Water Storage Bodies

6.29 Securing appropriate long term management of the water bodies and their margins by one or more competent bodies is critical, and this will form an essential part of planning obligations associated with any grant of planning permission.

6.30 The long term management and monitoring of this area will therefore be passed to appropriate bodies with experience of managing the storage and supply of water, and specialised habitat. Given that it will take over forty years to complete the extraction of sand and gravel in this part of the site and to complete restoration to these uses, this will be done on a phased basis.

6.31 The Environment Agency will be responsible for setting the operating rules for the flood storage area, including the levels at which the water is stored and removed from the area. The Environment Agency will also be responsible for ensuring that the area is operated and maintained in accordance with the operating rules.

6.32 The details of any arrangements will be secured through a legal agreement between the relevant parties involved, including the Environment Agency, mineral and waste operators, land owners, and relevant competent bodies (drainage and nature conservation). Agreements must be in place before any planning permission will be granted.

7 Recreation and Leisure

Navigation

7.1 The River Great Ouse and its tributaries, the Rivers Cam, Lark, Little Ouse and Wissey, comprise the major navigation in the Fens and East Anglia, providing about 240 km (150 miles) of navigable waterway. These rivers flow through some of the most unspoilt water environments in the Country.

Picture 7.1 River Cam

7.2 The lower reaches (Old West River and then the Ely Ouse) take boaters through the fenland landscape. The Bedford Rivers, also known as the Hundred Foot Drain (which is tidal) and Old Bedford River, were constructed as drains and run from Earith area in the south towards the Denver Sluice area in the north. The Counter Drain is also a navigable from Welches Dam Lock to the Old Bedford Sluice, although in practice this is problematical due to the condition of the Lock, leakage of water from the Forty Foot, and the small window available when tidal levels are favourable at the Bedford Sluice.

7.3 The Environment Agency is the navigation authority, but the Middle Level Commission also has statutory duties in respect of maintaining navigation routes. Many improvements have been made which has contributed to the rise in the leisure use of the Fens. The Environment Agency and partners are working on developing a Fen Waterways Link which will connect the cathedral cities of Lincoln, Peterborough and Ely. This is a 20 year project which seeks to enhance the existing waterways, opening up 240 km of waterway including 80 km of new waterway for navigation. It will create a new circular waterway for recreation, tourism and the environment, through the Fens, and provide a focus for economic regeneration in the area.

7.4 In order to achieve the above objectives there is likely to be a need for more active water management to ensure navigation is serviced and maintained. The void left following mineral extraction within the Block Fen / Langwood Fen area will provide additional water storage capacity as part of the final restoration.

7.5 There is also a clear opportunity to address the issue of the Forty Foot Drain, which is currently navigable only part of the year, due to low water levels. Permitting mineral extraction south of the Forty Foot will enable the land to be 'sealed' through quarry engineering, perhaps in advance of mineral extraction, and will help to stop the current migration of water out of the Drain. This will address the lack of water in the Forty Foot Drain and will help to maintain adequate water levels to allow navigation at any time.

7.6 This will contribute to the proposed new navigable link between the Forty Foot (Vermuyden's) Drain and the Counter Drain (Old Bedford River).

Recreation

7.7 At present informal public access into the Block Fen / Langwood Fen area is limited, focused on a limited number of public footpaths, and the linear paths which follow the banks of the Low Bank (west of the Counter Drain) and the Ouse Washes.

7.8 More formal recreational activities are offered by the Mepal Outdoor Centre which lies south of the A142. This is set on the shores of a lake, enabling it to offer a wide range of water and land based activities for families, school and youth groups and corporate clients. Two other water bodies, provided through earlier sand and gravel extraction are used for fishing and jet skiing.

7.9 The Regional Spatial Strategy encourages local authorities and others to make clear strategies for improving informal recreation, for both local residents and visitors. This is being taken forward by local policies and strategies, which seek to enhance recreation.

7.10 Through the creation of water bodies and new lowland wet grassland recreational activities in the Block Fen / Langwood Fen area will be increased. Although it will not be possible to provide for recreation in areas where active mineral extraction and restoration is taking place, as development progresses and restoration is completed, recreational provision will come on stream.

7.11 With regard to the lowland wet grassland area, it is envisaged that will be completed by 2036. Access should be possible to this area throughout the year, although at certain times of the year direct access onto the wet grassland may have to be restricted as this would disturb ground nesting birds, but at other times more general access would be allowed for informal low key activities such as walking and bird watching.

7.12 Equally as the water storage bodies are completed other activities such as fishing, water sports, and walking could be extended into these areas.

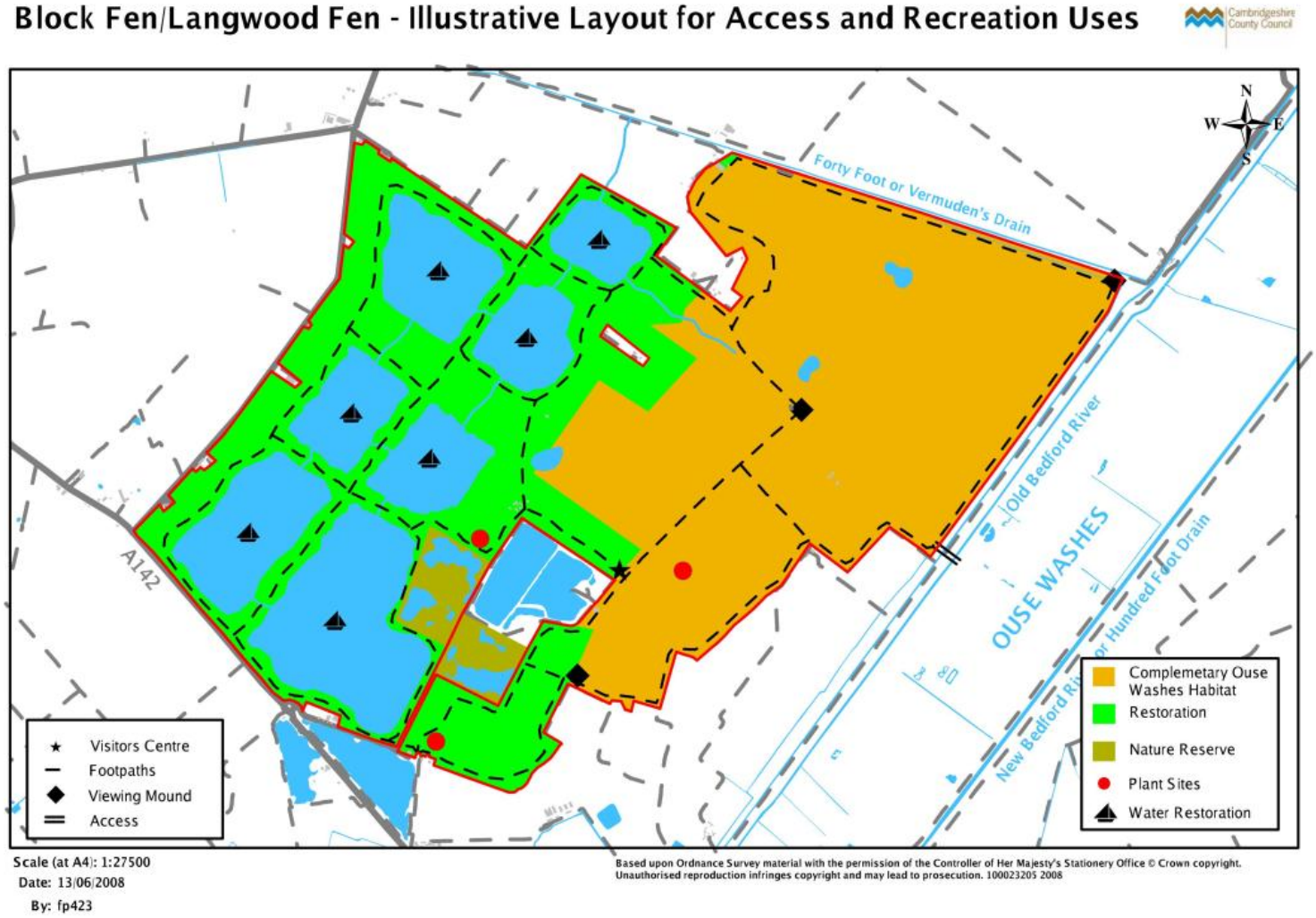
Picture 7.2 Ouse Footpath

7.13 A network of paths will be provided with viewing points (some of which may be raised), with at appropriate places outdoor interpretation boards. An illustrative layout is provided in Map 7.

7.14 In due course a visitor centre will be provided, this will provide a focus for people visiting the area. The visitor centre will be located near to the existing lakes at Block Fen. As the development of the area will be phased, the visitor centre should also be approached in this way, starting with a limited car park and low key interpretation facilities. However, as the area expands this should be developed too, to provide around a car park of around 150 spaces, a building around 500 m2 providing a tearoom, toilet and a multifunctional space. Flexibility to provide an educational function, and to extend the visitor centre and car parking in the future should also be retained. This is based on an assumed visitor level of 60,000 visitors per year, with a shared use of the centre between those wishing to use the nature reserve and / or the lakes for recreational purposes.

7.15 Ultimately this area will provide an important green space for the populations of nearby towns and villages, providing part of a wider strategic recreational strategy between Fenland, East Cambridgeshire and beyond.

7.16 In order to reduce the impact of traffic movements and assist in addressing climate change, access to the site for recreation purposes via public transport or cycling will be encouraged. Whilst initially this may be mainly via bus, the navigational improvements should also mean that access via the water would be increased in the longer term.



Map 7.1 Block Fen / Langwood Fen Master Plan 2050 - Footpaths

8 Traffic

8.1 The location of sand and gravel reserves dictate where extraction will take place, and the traffic movements associated with this have to be managed to minimise adverse effects on the local communities and the highway network.

8.2 The existing mineral and waste disposal operations in the Earith / Mepal area, including those at Block Fen / Langwood Fen, Earith and Somersham already give rise to lorry movements in the area. Over the short to medium term the main focus of and gravel extraction will move more towards the Block Fen / Langwood Fen area. Mineral extraction at Colne Fen for example will come an end in the short term, but Somersham is likely to continue operation into the medium term. Capacity provided by the Colne Fen Quarry will effectively be replaced through the implementation of an existing planning permission for a new quarry at Block Fen / Langwood Fen.

8.3 With the development of waste recycling and disposal operations in this area, additional lorry movements will be generated.

Traffic Movement

8.4 Over the period to 2026 the focus of mineral extraction in the Earith / Mepal area will be primarily on Block Fen / Langwood Fen. In the short to medium term some quarries will be active in the Somersham and Earith area, but these operations will then be replaced by existing and allocated sites in the Block Fen / Langwood Fen area coming on line. In terms of lorry movements the pattern will therefore gradually change, and there will be an increase of around 15% in the overall level of movements associated with Block Fen.

8.5 Lorry movements will also be generated by the movements of construction waste to the Block Fen / Langwood Fen area for recycling and then for disposal (and use in the creation of the lowland wet grassland).

8.6 A survey has been undertaken on existing traffic movement (September 2007), and this has been used to estimate potential traffic movements arising from the proposed uses at Block Fen. The results are set out below.

	Minerals	Waste	Total
Max Permitted vehicle movements (with planning permission)*	**530**	**54****	**584**
Vehicles recorded on survey date 12/09/07	**322**	**86**	**408**
Anticipated vehicle movements	**464**	**208**	**672**

2010- 2026

Table 8.1 Estimated Daily Quarry and Waste Management Goods Vehicle Movements

8.7 *excludes short term mineral sites at Colne Fen and Sutton Gault

8.8 ** Increase in waste movements to 138 proposed in a current planning application before CCC

8.9 As mineral extraction ceases in sub production areas A and B, and the creation of the new lowland wet grassland is completed in area A (around 2036), the number of vehicle movements associated with mineral and waste management will decline significantly, and remain at a much lower level until the site is fully worked and restored.

Sustainable Transport

8.10 Consideration has been given as to the feasibility of encouraging the use of more sustainable models of transport for the bulk movement of minerals and waste associated with operations at Block Fen.

Water

8.11 The Fortyfoot river lies along the northern boundary of the site . At present the navigability of the section between Horseway Lock is affected by problems associated with retention of water levels for river craft caused by seepage. Whilst proposed extraction of minerals may provide opportunities to address this problem generally the size of waterways and lock infrastructure are focussed on leisure traffic and not designed to accommodate barges for the transport of aggregates/waste. Also the navigable sections of waterway do not facilitate easy access to the future major growth areas (demand for aggregates and generation of waste) of Cambridgeshire. It has thus been concluded that transport of minerals/waste to and from is not feasible and therefore deliverable.

Rail

8.12 The Block Fen mineral deposits are not located close to rail infrastructure. The nearest locations to the area are at Manea (existing rail line) or Chatteris (old railway formation).

8.13 In respect of the latter the former railway alignment south of Chatteris to Somersham, St.Ives and Cambridge has been largely compromised by a number of new developments including industrial development, infilling of cutting with waste, mineral extraction, new road construction and the Cambridge - St.Ives Busway. It has therefore been concluded that the use of this old formation to relay a railway to supply the Cambridge area with aggregates from Block fen is not feasible and therefore deliverable.

8.14 The existing railway at Manea links to Ely and Cambridge. One siding exists at Manea station but vehicular access for any transhipment traffic from Block Fen would have to be gained through the village. The siding is also close to existing housing. The impacts associated with using any existing siding capacity at Manea would have local amenity implications which are considered undesirable.

8.15 Block Fen is located 5 km from the March to Ely railway. Notwithstanding the high cost likely to be associated with the construction of a new junction and branch line the following are also relevant considerations, namely :

- The market for sand and gravel is local with generally over 85% being sold within 25 miles of a quarry
- No mineral users /waste generators in Cambridgeshire have facilities to receive sand and gravel by rail/dispose of waste by rail. Many customers already located close to major roads
- Mineral and waste rail movements need to be in bulk (circa 1000 ton loads) to be economic
- The optimum break-even distance for rail distribution is between 100-150 miles (which would only facilitate out of county movements)
- High cost of establishing rail/road transhipment facilities (circa £3m)
- High capital investment costs in annual train and wagon hire
- Costs of rail are 5 times more expensive than road alternative

8.16 On the basis of the above it has been concluded that rail transport of sand and gravel / construction waste to meet the needs within Cambridgeshire and Peterborough is not economically viable and therefore undeliverable.

Traffic Management

8.17 The significant growth agenda in Cambridgeshire and Peterborough will bring an increase in traffic movements. A part of this, as outlined above, will be attributable to mineral and waste management activities supporting new and existing communities. This issue will require careful consideration in its entirety by the relevant organisations involved, including the Local Planning Authorities, the Highways Agency and Cambridgeshire County Council as Local Highways Authority.

8.18 The principle highway within the Area Action Plan area is the A142 Ely Chatteris road. The Cambridgeshire Local Transport Plan 2006 - 2011 sets out the Road Hierarchy for Cambridgeshire. The A142 is a Primary Road which links to the A10, and are therefore routes where freight traffic should be directed. Also lorry traffic would not be precluded from using other roads including Main Distributor Roads such as the A1123, A1421, B1040, B1049 and B1050 (south of Earith) unless there are restrictions in place e.g. weight restrictions.

8.19 The County Council as Highway Authority is currently reviewing the Road Hierarchy and there may be consequential revisions to the current designation of roads.

8.20 With regard to minerals and waste management traffic, in the future the average payload of vehicles is likely to increase, whilst the total number of movements can be reduced by the 'backloading' of lorries where they bring in one type of load, and take out another. Mineral and waste operations lend themselves to this as new sand and gravel or recycled aggregates can be taken to the development site, and waste materials removed at the same time and brought back for recycling or disposal. The principal waste operator in this area has indicated that up to 50% of lorry movements could be 'backloaded', and that this may increase over time. Other initiatives may also include off-peak deliveries, the use of mineral transfer stations and private haul roads.

8.21 In addition the Mineral Planning Authority will require through legal agreements, routing arrangements and HCV signage for mineral and waste traffic to principally use the Primary Roads as defined by the Highways Authority. Lorry traffic cannot be prevented from using other routes entirely as some local jobs are likely to arise.

8.22 With regard to access to Block Fen / Langwood Fen, the existing Block Fen quarries are already accessed from the A142 via a purpose built roundabout. This roundabout is considered to have more than adequate capacity to accommodate the traffic likely to be generated by the proposed mineral extraction and construction waste recycling and disposal activities, and the Highway Authority have advised that this should be the sole means of access to the site.

8.23 Proposals for new mineral extraction and waste management development will therefore only be considered favourably where access is achieved via the existing roundabout junction off the A142 at Block Fen. Overall impacts on the highway network would be considered in any District review of the Local Development Frameworks.

8.24 Within the site the main ‘internal’ road is Block Fen Drove. This passes adjacent properties and is narrow at certain points. In the light of continued and increased lorry movements further consideration may have to be given to the Droves maintenance, and if necessary this would involve widening or off line improvements. The grant of further planning consents will be conditional on a contribution to secure the satisfactory improvement of this Drove.

Recreational Traffic

8.25 Proposals have been set out for the provision of recreational facilities which will be provided in a phased manner, as the nature conservation and recreational uses of the site develop. These proposals have been based on an assumed visitor rate of 60,000 visitors per annum once the site is complete. There is an expectation that visitors may visit using a variety of means e.g. cycle, car, bus; and that visitor numbers will be highest at weekends through the spring and summer periods.

9 Sustainable Use of Soils

9.1 The Earith / Mepal area is known to contain some of the best and most versatile soils in the Country, and this is reflected by part of the land being graded under the Agricultural Land Classification Scheme as Grades 1 and 2.

9.2 National planning policy seeks to protect high quality land and prevent its loss, and where it is going to be developed for an alternative use, it requires a scheme for the sustainable use of soils for the longer term.

9.3 A package for the sustainable use of soils can encompass a range of different aspects. This can include for example:

- ensuring land can be put back into agricultural use if required
- relating restoration proposals to the soils resource
- considering the wider benefits of proposals on the soil resource
- securing appropriate long term management of the restored land and associated soils
- using surplus soils to improve areas of poor soils in the area

9.4 A survey has been undertaken in order to obtain soils information to inform the preparation of this Master Plan. It has been established that the range of soils across the site is complex, with significant variation in texture both laterally over short distances, but also vertically down the soil profile.

9.5 In terms of topsoils these can be divided into three main groups, namely peaty / organic mineral mainly found in the north of the site area, loamy soils which form the main topsoil type, and a smaller area of clayey soils towards the west of the site.

9.6 Subsoils can be grouped into two main categories, being a complex loamy and clayey soils which occur over the majority of the site, and a small area to the west of the site which has clayey soils. A particularly feature of these soils is their permeability which has been established through a well developed soil structure which will contribute significantly to the flexibility of the use of the land.

9.7 Very few areas of deeper peats were identified, but where found these were towards the south of the site. The pH varies across the site, but very few samples were recorded below 5, and the majority of top and sub soils were in the 6-7 range.

9.8 It has been confirmed that soils on the active mineral sites have generally been handled with care, and stored recognising their different characteristics.

9.9 One of the main issues to be addressed with regard to soils within any restoration strategy, is to achieve a balance between the depth and permeability. It will be important to retain the topsoils together with the structure and depth of subsoils. Increased soils depth and consistency would be beneficial to the long term sustainability of the land, and the survey that has been undertaken indicates that with the soils on site this should be a readily achievable objective.

9.10 In considering a sustainable soils restoration package regard also needs to be had to the function the soil, as existing and proposed under restoration plans. Approaching restoration from the perspective of the soil function enables a wider consideration of how soils can be used in a sustainable way. The table below sets out information on the range of issues relevant to soil function, and the proposed afteruses of the site.

Soil Function	Food and Fibre Production	Platform for construction	Environmental Interaction	Source of Raw Materials	Protection of Cultural Heritage	Support for Habitats and Biodiversity	Comments
Existing Use- Agriculture	✓	✓	✓	✓	✓	✓	Main function is food and fibre production with the others as potential or latent functions.
Proposed Afteruse:							
Agriculture	✓	✓	✓	✓	?	✓	Main function food and fibre but with positive measures to secure habitat and biodiversity gains increased soil depth and consistency will be a positive benefit.
Nature Conservation	✓	✓	✓	✓		✓	Assume cultural heritage in soils layers has been assessed and either preserved or recorded prior to working.
Water Storage			✓			✓	Indirect impacts on food and fibre production through irrigation. Permeability of the subsoil is a particular attribute of the site and should be retained in any restoration strategy.
Recreation	✓	✓	✓	✓	✓	✓	Potential for all functions to be utilised.

Table 9.1 Main Soil Functions

9.11 The above table identifies six main soils functions, those that are particularly relevant to Block Fen / Langwood Fen are,

- the effect of development on the range of soils functions
- the loss of existing soil function or the creation of a beneficial function through proposed land use
- the potential for the reduction of impact or the increase of benefit
- the possibility to compensate and mitigate for impacts.

9.12 The following are therefore matters which will need to be addressed in any restoration strategy:

- depth and consistency of soils in terms of restoration objectives, especially the use of surplus soil arising from the proposed land uses to achieve a deeper and more consistent soil profile across the site
- the avoidance of soil organic matter loss. Although the extent of peat soils across the site is not as extensive as fist envisaged, measures should be put in place to ensure that the organic soils remaining are best utilised and maintained. The range of land uses proposed allows this issue to approached with greater flexibility and with a long term perspective
- handling and movement of soils to retain inherent characteristics especially the permeability of the soils and to avoid losses through wind and water erosion
- soil water regime to ensure the effective drainage of the site and/or ground water control for the range of land uses.

9.13 To achieve the full potential of the site in terms of sustainable use of soil, a comprehensive approach will have to be taken which may involve the co-operation of landowners and the minerals and waste industry.

9.14 With regard to achieving the above some opportunities to meet sustainable soil objectives have already been identified. The methodology for the creation of lowland wet grassland would allow the land to revert back to an arable agricultural use should this be required in the long term.

9.15 There are also opportunities to relate the soil resource to the restoration uses of the site. For example, if an area which is to be developed for the water bodies proves to have good peaty soil capable of proving a good basis for lowland wet grassland, this soil can be carefully removed, stored and placed in another area of the site being used for habitat creation. Relocating and using the soil in this way ensures it will be not be lost, but will be managed for the longer term.

9.16 The wider benefits on the soils of the area are also becoming evident and represent an important resource which must be used sustainably. The creation of the water bodies on the site will displace high quality soils from this area, which will not be put back in place. This can be compensated for by their use in the creation of the enhancement habitat as described above, or they could be removed to address soil management problems in another area i.e. to augment depleted peat derived soils off site. In addition, the creation of the water storage bodies, and the transfer of water into the Middle Level area will compensate for the displacement of soils by supplying water to irrigate the much wider area, enabling the soils in this area to be kept moist (preventing their erosion by the wind), whilst enhancing their productivity for crops.

9.17 Also, it is not enough just to use the soils in a sustainable way; in order to keep them in the 'carbon store' it is necessary to secure their long term future management. Arable production on peat soils causes the release of carbon dioxide held in the peat as it oxidises after ploughing. Grassland is a land use that

helps protect the peat resource and reduces the release of carbon dioxide. Restoring the Block Fen /Langwood Fen to wet grassland is a practical action to reduce emissions in line with the County Council's commitment to addressing the challenge of climate change.

9.18 The management of the land and soils uses that will be created is already being addressed, and the arrangements for the enhancement habitat and water storage areas are addressed more fully in Sections 5 and 6 of this Plan.

9.19 More detailed survey work will be required at planning application stage, and this will be needed to inform detailed proposals addressing phasing, restoration and the sustainable use of soils. Appropriate arrangements would be secured by planning condition or planning obligations through any planning permissions granted.

10 Conclusions

10.1 The Block Fen / Langwood Fen area is unique, not only in terms of its location and characteristics, but also in terms of the opportunities it offers. This Master Plan seeks to address the challenges that exist in taking forward this area for sand and gravel extraction and waste recycling and disposal in support of the construction industry, and at the same time determine a sustainable way of restoring the site which will contribute to addressing national and international issues such as climate change, create enhancement habitat for the internationally important Ouse Washes, help deliver more sustainable flood risk management, and address the need for water storage and supply in the Fens.

10.2 There is a window of opportunity to consider and plan for this area in a comprehensive and forward looking way. We need to grasp this now before the current restoration plans for the existing quarries are implemented. If these go ahead in their present form the chance to deliver the wider objectives of this Plan would be compromised.

10.3 The vision and objectives set out in this Plan are deliverable through the co-operation and commitment of a number of parties, and formal mechanisms such as legal agreements and planning conditions which can be implemented through the land use planning system. Prior experience has shown this can be achieved. The key stakeholders have already worked together to deliver the existing access to the permitted quarries, and to help define the future strategy for the Block Fen / Langwood Fen area through the development of this Master Plan.

11 Appendix 1

Key Policies

List of Key Policies in the Cambridgeshire and Peterborough Minerals and Waste Plan - Core Strategy:

CS1 - Strategic Vision and Objectives for Sustainable Minerals Development

CS2 - Strategic Vision and Objectives for Sustainable Waste Management

CS3 - Strategic Vision and Objectives for Block Fen / Langwood Fen

CS4 - Scale of Future Sand & Gravel Extraction

CS5 - Earith / Mepal Area

CS7 - Recycled and Secondary Aggregates

CS14 Scale of Waste Management Provision

CS20 - Inert Landfill

CS22 - Climate Change

CS24 - Design of Sustainable Minerals and Waste Management Facilities

CS25 - Mineral Safeguarding Areas

CS26 Mineral Consultation Areas

CS27 - Restoration and Aftercare of Mineral Workings

CS29 - The Need for Waste Management Development and the Movement of Waste

CS27 - Waste Consultation Areas

CS32 - Traffic and Highways

CS33 - Protection of Landscape Character

CS34 - Protecting Surrounding Uses

CS35 - Biodiversity

CS36 - Archaeology and the Historic Environment

CS37 - Public Rights of Way

CS38 - Sustainable Use of Soils

CS39 - Water Resources and Pollution Prevention

12 Appendix 2

Planning Applications

12.1 The 1 App (the single planning application form) system is now in place in Cambridgeshire and details of the requirements of this system are available at http://www.cambridgeshire.gov.uk/environment/planning/applications.

12.2 All potential applicants are advised to contact Cambridgeshire County Council's Minerals and Waste planning team to arrange for pre-application discussions (telephone 01223 715529).

12.3 The Environment Agency has advised that any hydro-geological impact assessment should include:

- a survey of existing on-site ground levels and flow patterns, including any previous monitoring on areas with planning permission
- a water features survey, including all abstractors and potentially affected surface water features
- an assessment of the impact of d watering operations and any mitigation needed
- the short and long term impact of blocking flow in the aquifer with impermeable barriers. There is potential for groundwater levels to rise on the upstream side and fall on the downstream side
- proposals for dealing with any areas of higher permeability material discovered within the underlying Ampthill clay, and proposals for sealing off large watercourses such as the Forty Foot Drain
- details of how flow patterns will be re-established following restoration.

12.4 In relation to the creation of wet grassland habitat details will be required on how the water levels are to be achieved and how the hydrology of the site might deliver the habitat. Applicants are advised to refer to the Environment Agency's Eco-hydrological Guidelines for Lowland Wetland Plant Communities published in 2004. This will provide background for the water requirements of the created habitat.

12.5 As part of any planning application for this site a Flood Risk Assessment (FRA) will need to be produced to address the risk of flooding to the site, and to address any potential increase in surface water generated by new hard standing and / or changes in soil types / landforms. Any FRA would need to be to the satisfaction of the Environment Agency and the Middle Level Commissioners.

12.6 In accordance with the recommendations of the Habitats Regulation Assessment, applicants will be required to prepare a scheme of measures for dust suppression to avoid direct and indirect dust deposition having adverse effects on the Ouse Washes.

12.7 In accordance with the recommendations of the Habitats Regulation Assessment,applicants will be required to prepare a scheme of noise suppression to avoid noise having adverse effects on the Ouse Washes environment.

13 Appendix 3

Methodology for the Creation of Enhancement Habitat

Wet Grassland Features

13.1 It is proposed that the wet grassland features will comprise of surface scrapes and foot drains / wet furrows. Furrow spacing will be chosen to provide if possible moist surface conditions between the furrows. The wet features will be replenished with water during the winter period to provide optimum water levels by the end of March or earlier if desired. Water levels will be maintained in the features during the earlier part of the breeding season and then allowed to fall towards the end of the breeding season.

Soil conditions and suitability for wet grassland development

13.2 The soil profile to be developed will comprise of a 500 mm depth of clay cap on top of the inert fill, followed by 650 mm depth of subsoil, with a 250 mm depth of peat on the surface. The depth of usable soil profile will, therefore, be a minimum of 900 mm. If possible a depth of 1.2 metres would be preferred, formed by having a greater depth of peat, which would increase the effectiveness of the wet grassland.

13.3 The peat topsoil will have a high water holding capacity and be ideal for water transmission, grass establishment and bird probing, but its depth is rather limited. In developing the features every effort needs to be taken to maintain as much peat in the surface layer as possible.

13.4 Of the 3 samples of subsoil taken, 2 were a gravely sandy clay loam (southern storage area) and the third a gravely loamy sand (northern storage area). The gravely nature of these sandy and loamy soils are likely to have a moderate to high hydraulic conductivity providing they are not significantly compacted during placement. (The hydraulic conductivity of the samples will be measured in the laboratory during the next few weeks to quantify values).

13.5 Due to the anticipated hydraulic conductivity of the subsoil and the overall profile depth (900 mm), there is a good chance that with appropriate furrow spacings and water levels, it should be possible to maintain moist surface conditions between the foot drains.

Critical requirements in soil placement

13.6 To obtain optimum soil conditions during soil placement, every effort must be taken to achieve the following:

- maximise the depth of peat in the surface layers
- avoid excessive compaction when placing the subsoil

13.7 To achieve these desired conditions attention must be paid to the following:

- ensure the surface of the clay cap is level before subsoil placement
- initiate the main wetland features within the subsoil layer before placing the peat topsoil.

13.8 Discussions are needed with the contractor to devise a placement method with the equipment available or obtainable, which will produce a consolidated soil condition without excess compaction.

13.9 If possible, running large heavy dump trucks over the subsoil during placement should be avoided, as this is likely to cause considerable compaction. If such operations are unavoidable and serious compaction occurs, it will be necessary to subsoil after subsoil placement before the peat layer is spread.

13.10 A much more satisfactory way of using large dump trucks is for them to be confined to the clay cap. However, this should only be contemplated when there is a significant thickness of soil in place to avoid damage to the engineered containment of waste. They can then dump their soil at the edge of the advancing subsoil laying zone and the dumped soil spread, leveled and consolidated by a lighter tracked dozer.

13.11 The peat layer will have to be spread on a compaction vulnerable subsoil, hence relatively small light tracked dumpers and light tracked dozers would be ideal for this operation.

Other site requirements

Retention of water within the grassland cell

13.12 To retain water within the wet grassland cell, it will be necessary to ensure that the current compacted clay layer around the cell boundary extends upwards to an elevation above the final soil surface, with some additional allowance to allow for some surface water ponding.

Reservoir

13.13 A reservoir will be required to store water for water supplementation during the breeding season. This could be above ground storage, allowing gravity feed into the wetland or below ground, possibly in an existing borrow pit from which water would have to be pumped into the reserve. The choice will be dependent upon the water source, the type of power supply available for pumping and the costs.

13.14 If an above ground reservoir is to be constructed, consideration could be given to the possibility of its capacity also meeting the requirements of additional cells in the future.

Drainage

13.15 The winter rainfall input will exceed the water storage capacity of the wetland features in most years, hence there will be a need for a drainage outlet from the enclosed basin to prevent unwanted flooding. Providing a control on this drain outlet would also provide a means of lowering water levels within the features as required during wet spring / summer periods.

Supplemental water requirements

13.16 The moisture deficit values (mm) at the end of June for this area as follows:

Table 13.1 Moisture Deficit Values

	Dry Grassland	Wet Grassland	Open Water
Dry Year (Higher Quartile)	104	166	200
Median Year	86	122	150
Wet Year (Lower Quartile)	68	86	110

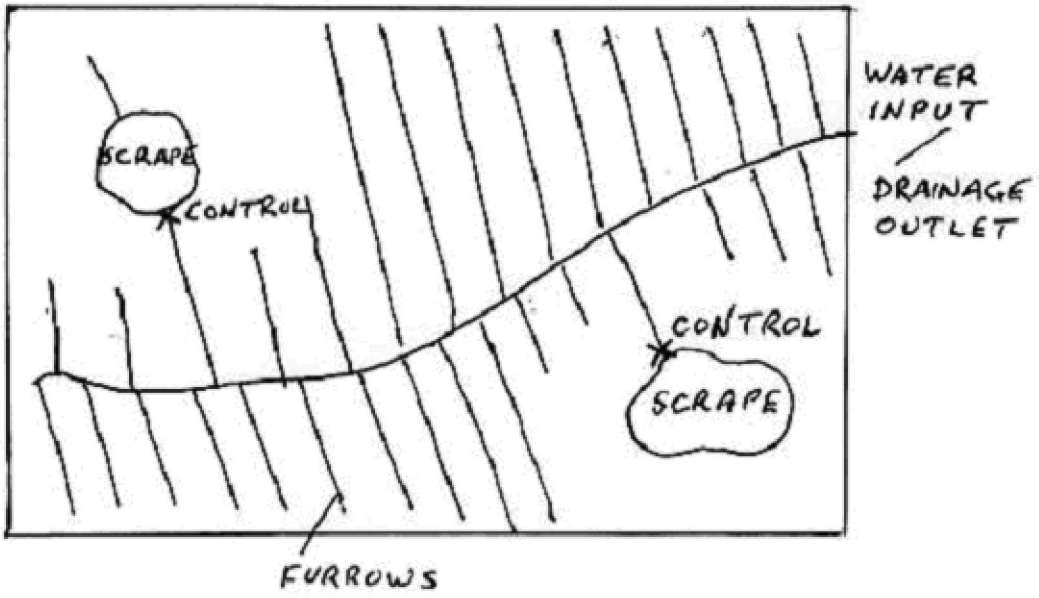
13.17 Assuming some 20% of the area will be open water held within the scrapes and furrows, and that the whole grassland surface can be kept moist, the dry year water losses through evapo-transpiration through to the end of June will be 1700 m^3 / ha.

13.18 Allowing the open water levels to fall during the period to the end of June, the dry year supplementary water requirement will be as follows:

Water Level Fall	Supplementary Water Requirement
20cm	1300 m^3/ha
25cm	1200 m^3/ha

Water management options

13.19 The uniformity of the site will restrict the options available for water management within the different features. Whilst it may be advantageous at times to manage water levels in the scrapes differently to those within the foot drains / furrows, this will be more difficult due to the hydraulic connection within the subsoil. Cutting off the water supply to the scrape with a control structure in the supply channel will stop direct water inputs, but there will still be some seepage inflow through the subsoil. This seepage inflow can be minimised by extending the distance between the nearest furrows and the scrape, so increasing the seepage distance and hence reducing the amount of water inflow, see rough schematic layout below. The other alternative would be to install a seepage cut-off curtain around the scrape.



Picture 13.1 Wet Grassland Features

13.20 The maximum depths of the features could be varied, allowing different areas to dry up or be wetted at different times. The side slopes of the scrapes can also be chosen so that the desired amount of muddy margin is exposed for a given fall in water level.

Project assessments

13.21 As the site is only likely to be of the order of 6 – 8 ha in extent, it may be too small to make a wholly satisfactory bird assessment. It can, however, provide valuable information on the hydrological aspects of developing wetland conditions in these circumstances. Dipwell information would allow the hydrological characteristics of the restored soil to be assessed. In addition, the project could trial a shallower depth of surface peat, or the introduction of compost as an alternative or supplement, to provide information applicable to future situations where peat may be in short supply.

13.22 In the current absence of quantitative hydraulic conductivity data, it is suggested that the foot drains / furrows be installed at a spacing of some 20 – 25 m. If hydraulic conductivity data comes to hand before soil placement, adjustments can be made if necessary to this spacing. Optimum spacings, if different to those at installation, could be determined from subsequent field monitoring.

14 Appendix 4

Ouse Washes Citations

CITATION 1

- **COUNTY:** CAMBRIDGESHIRE **SITE NAME:** OUSE WASHES
- **Status:** Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981
- **Local Planning Authorities:** East Cambridgeshire District Council, Fenland District Council, West Norfolk District Council
- **National Grid Reference:** TL 393747 to TL 571987
- **Ordnance Survey Sheet 1:50,000:** 143 **1:10,000:** TL 37 SE, TL 37 NE, TL 47 NW,TL 48 SW, TL 48 SE, TL 48 NE,TL 58 NW, TL 59 SW,TL 59 NW, TL 59 NE
- **Date Notified (Under 1949 Act):** 1955 **Date of Last Revision:** 1971
- **Date Notified (Under 1981 Act):** 1984 **Date of Last Revision:Area:** 2,403 ha 5,937 ac

Other information: The Ouse Washes lie between The Hundred Foot/New Bedford River to the south-east and the Old Bedford River/Counter Drain to the north-west. These rivers fall within the boundary of the Site of Special Scientific Interest. The Old Bedford River in particular is of national nature conservation importance in its own right.

The Ouse Washes play a major land drainage role as a flood water storage area and the washland is thus subject to regular winter flooding. In the summer months the area provides grazing and hay.

The regular winter flooding and the continuance of traditional management of cattle grazing and hay cutting maintains the nature conservation value of the area. The majority of the site is under nature reserve management by the Bedfordshire and Huntingdonshire Naturalists' Trust, the Cambridgeshire and Isle of Ely Naturalists' Trust, the Royal Society for the Protection of Birds and the Wildfowl Trust.

The Ouse Washes are listed under the Government ratified RAMSAR Convention of 1972 in view of their international importance as wetland habitat. This is a Nature Conservation Review Grade I * site.

A boundary modification has been made at this revision to exclude an area of arable.

Description and Reasons for Notification

The site is one of the country's few remaining areas of extensive washland habitat. It is of particular note for the large numbers of wildfowl and waders which it supports, for the large area of unimproved neutral grassland communities which it holds and for the richness of the aquatic fauna and flora within the associated watercourse. The capacity of the site to hold wintering and breeding waterfowl and waders is of international significance. Of particular note in the winter are the large numbers of teal *Anas crecca*, pintail *Anas acuta*, wigeon *Anas penelope*, shoveler *Anas clypeata*, pochard *Aythya ferina* and Bewick's swan *Cygnus bewickii.*

The grassland communities of the area are characterised by such grasses as reed and floating sweet-grass *Glyceria maxima* and *G.fluitans*, reed canary-grass *Phalaris arundinacea*, marsh foxtail *Alopecurus geniculatus* together with a variety of sedges and rushes. Typical herbs include amphibious bistort *Polygonum amphibium*, water-pepper *Polygonium hydropiper* and tubular water-dropwort *Oenanthe fistulosa*.

The associated dykes and rivers hold a great variety of aquatic plants, the pondweeds *Potamogeton* spp. are particularly well represented. Other aquatic species include the fringed water-lily *Nymphoides peltata*, greater water-parsnip *Sium latifolium* and the four species of duckweeds *Lemna* spp.

The limnological interest of the Ouse Washes is further diversified by the Old Bedford River and River Delph, both good examples of base-rich, sluggish, lowland rivers. The flora includes the fan-leaved water-crow foot *Ranunculus circinatus*, yellow water-lily *Nuphar lutea*, arrowhead *Sagittaria sagittifolia*, long-stalked pondweed *Potamogeton praelongus*, perfoliate pondweed *Potamogeton perfoliatus*, and river water-dropwort *Oenanthe fluviatilis*. The associated aquatic and semi-aquatic fauna is similarly diverse.

CITATION 2

Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat

Ouse Washes (Cambridgeshire, Norfolk)

The Ouse Washes Ramsar site and its proposed extension is a wetland of major international importance comprising seasonally flooded washlands which are agriculturally managed in a traditional manner. It provides breeding and winter habitats for important assemblages of wetland bird species, particularly wildfowl and waders.

The boundaries of the Ramsar site as extended are coincident with those of the Ouse Washes SSSI.

The site qualifies under Criterion Ia by being a particularly good representative example of a natural or near-natural wetland characteristic of its biogeographical region. It is one of the most extensive areas of seasonally flooding washland of its type in Britain, and the wetland has high conservation value for many plant and animal groups.

The site qualifies under Criterion 2a by supporting a number of rare species of plants and animals. The site holds several nationally scarce plants, including the whorled water-milfoil *Myriophyllumverticillatum*, greater water parsnip *Siam latifolium*, river water-dropwort *Oenanthefluviatilis*, fringed water-lily *Nymphoides peltata*, long. stalked pondweed *Potamogetonpraelongus*, hair-like pondweed *Potamogeton trichoides*, grass-wrack pondweed *Potamogetoncompressus*, tasteless water-pepper *Polygonummite*, small water-pepper *Polygonum minus* and marsh dock *Rumexpalustris*. Invertebrate records indicate that the site holds a good relict fenland fauna for several groups, reflecting the diversity of wetland habitats. Two rare Red Data Book insects have been recorded, the large darter dragonfly *Libellulafulva* and the riffle beetle *Oulimnius major*.

The Ouse Washes also qualifies under Criterion 2a by supporting a diverse assemblage of rare breeding waterfowl associated with seasonally flooding wet grassland. This includes breeding migratory waders of lowland wet grassland: oystercatcher *Haematopus ostralegus*, redshank *Tringa totanus*, snipe *Gallinago gallinago*, ruff *Phdomachuspugnax*. lapwing *Vanellus vanellus*, and black-tailed godwit *Limosa limosa*, and a diverse assemblage of breeding wildfowl with mute swan *Cygnus olor*, shelduck *Tadorna tadorna*, gadwall *Anasstrepera*, teal *A. crecca*, mallard *A. platyrityncbus*, pintail *A. acuta*, garganey *A. querquedu"* shoveler *A. clypeata*, pochard *Aythya ferina*, tufted duck *Aythya fuligu1a*, moorhen *Gallinulachloropus* and coot *Fulica atra* occurring regularly. Many of these species are rare and much restricted in Britain and the European Community owing to habitat loss and degradation. The site thus has an important role in maintaining the ranges of several of these species which have been affected by changes in habitat elsewhere in Britain. Breeding gadwall, mallard, garganey, shoveler and bar-tailed godwit are all present in nationally important numbers.

The Ouse Washes qualifies as a wetland of international importance under Criterion 3a by virtue of regularly supporting over 20,000 waterfowl, with an average peak count of 60,950 birds recorded in the five winter period 1986/7 to 1990/91.

The Ouse Washes also qualifies under Criterion 3c by supporting, in winter, internationally important populations of the following species (figures given are average peak counts for the five winter period 1986/87 - 1990/91): 4,980 Bewick's swan *Cygnuscolumbariusbewicki* (29% of the north-west European wintering population); 590 whooper swans *Cygnus Cygnus* (3% of the international population); 38,000 wigeon *Anaspenelope* (5% of the north-west European population); 4,100 teal *A. crecca* (1% of NW European); 1,450 pintail *Anas acuta* (2%NW European); and 750 shoveler *Anas clypeata* (2% of NW European). Also notable are the following nationally important wintering populations: 270 cormorant *Phalacrocorax carbo* (2% of the British wintering population); 490 mute swan *Cygnusolor* (3% of British); 320 gadwall *Anas strepera* (5% of British); 2,100 pochard Aythya *ferina* (4% of British); 860 tufted duck *Aythya fuligula* (1 % of British) ; and 2,320 coot *Fulica atra*.

During severe winter weather elsewhere, the Ouse Washes can assume even greater national and international importance as wildfowl and waders from many other areas arrive, attracted by the relatively mild climate, compared with continental European areas, and the abundant food resources available.

The continued international importance of this site is dependant on the maintenance of a winter flooding regime and a high, but controlled summer water table.

- Ramsar citation (Montreux 1990 Criteria)
- DAS/HTR June 1992

CITATION 3

Register of European sites

Register entry UK000804 under Regulation 11 of the Conservation (Natural Habitats &c) Regulations 1994

This is the register entry or the European site own as use Washes in the Counties o Cambs/Norfolk. This area has been classified by the Secretary of State for the Environment pursuant to Article 4(1) or (2) of the Wild Birds Directive (Council Directive 79/409/EEC) as a Special Protection Area. The register reference number for thus European site is UK000804 and a folder, kept under this reference as part of this register, contains a map of the European site and a citation, both signed by me, giving the reasons for the classification of the site as a Special Protection Area.

Other details of the European site are as follows:

- **Date Classified as a Special Protection Area:** 5 March 1993
- **Site centre location** [(i)]
- **longitude:** 00° 08' 51" E
- **latitude:** 52° 25' 46" N
- Area: 2,372.0 ha
- **Priority Status** [(ii)]**:** n/a
- **Date of registration:** 3 0 14"N 1996

i This indicates the approximate centre of the site. where the European site consists of several distinct areas, the co-ordinates of the most important sub-area are entered.

ii Indicates whether the site has been identified under Article 4.2 of the Habitats Directive (Council directive 92/42/EEC) as hosting one or more priority natural habitat types or priority species.

EC Directive 79/409 on the Conservation of Wild Birds: Special Protection Area

Ouse Washes (Cambridgeshire, Norfolk)

The Ouse Washes Ramsar site and proposed Special Protection Area is a wetland of major international importance comprising seasonally flooded washlands which are agriculturally managed in a traditional mariner. It provides breeding and winter habitats for important assemblages of wetland bird species, particularly wildfowl and waders.

The boundaries of the proposed Special Protection Area are coincident with those of the Ouse Washes SSSI. apart from the exclusion of a section of the Old Bedford River in the north of the SSSI.

The Ouse Washes qualifies under Article 4.1 of the EC Birds Directive by supporting, in summer, a nationally important breeding population of ruff *Philomachuspugnax*, an Annex 1 species. In recent years an average of 57 individuals have been recorded lekking, a significant proportion of the British population.

The site also qualifies under Article 4.1 by regularly supporting internationally or nationally important wintering populations of three Annex 1 species. During the five year period 1986/87 to 1990/91, the following average peak counts were recorded: 4,980 Bewick's swan *Cygnus columbarius bewickii* (29% of the north-west European wintering population, 70% of the British wintering population), and 590 whooper swans *Cygnus Cygnus* (3% of the international population, 10% of British). In addition, between 1982-87 an average of 12 wintering hen harrier *Circus cyaneus* was recorded, representing 2% of the British wintering population.

The Ouse Washes qualifies under Article 4.2 by supporting, in summer, in recent years, nationally important breeding populations of five migratory species: 111 pairs of gadwall *Anas strepera* (20% of the British breeding population); 850 pairs of mallard *Anasplatyrhynchus* (2% of British); 14 pairs of garganey *Anasquerquedula* (20% of British), 155 pairs of shoveler *A. clypeata* (12% of British), and 26 pairs of black-tailed godwits *Limosalimosa* (44% of British).

The site further qualifies under Article 42 as a wetland of international importance by virtue of regularly supporting over 20,000 waterfowl, with an average peak count of 60,950 birds recorded in the five winter period 1986/1 to 1990/'91. This total included-internationally or nationally important wintering populations of the following migratory waterfowl (figures given are average peak counts for the five winter period 1986/87 - 1990/91): 270 cormorant *Phalacrocoraxcarbo (296* of the British wintering population); 490 mute swan *Cygnus olor* (3% of British); 38,000 wigeon *Anas penelope* (596 of the north-west European population, *1596* of British); 320 gadwall *Anas strepera* (5% ofBritish); 4,100 teal *A. crecca* (1% *of* NW European, 4% of British); 1,450 pintail *Anasacuta* (2% NW European, 6% of British); 750 shoveler *Anas clvpeata* (2%of NW European, 8% of British); 2,100 pochard *Aythya ferina* (4% of British): 860 tufted duck *Aythya fuligula* (1% of British); and 2,320 coot *Fulicaatra* (l % of British).

The site also qualifies under Article 4.2 by virtue of regularly supporting, in summer, a diverse assemblage of the breeding migratory waders of lowland wet grassland. including: oystercatcher *Haematopus ostmlegus,* redshank *Tringa totanus*, snipe *Gallinago gallinago*, Ruff *Philomachuspugnax* lapwing *Vanellus vanellus,* and black-tailed godwit *Limosalimosa*; and a diverse assemblage of breeding wildfowl with mute swan *Cygnus olor*, shelduck *Tadorna tadorna*, gadwall *Anasstrepera,* teal *A. crecca*, mallard *A.platvrhynchus,* pintail *A. acuta*, garganey *A.querquedula,* shoveler *A. clypeata*, pochard *Aythya farina*, tufted duck *Aythya fuligula*, moorhen *Gallinula chloropus* and coot *Fulicaatra* occurring regularly. Many of these species are rare and much restricted in Britain and the European Community owing to habitat loss and degradation. The site thus has an important role in maintaining the ranges of several of these species which have been affected by changes in habitat elsewhere in Britain.

During severe winter weather elsewhere, the Ouse Washes can assume even greater national and international importance as wildfowl and waders from many other areas arrive, attracted by the relatively mild climate, compared with continental European areas, and the abundant food resources available.

The continued international importance of this site is dependant on the maintenance of a winter flooding regime and a high, but controlled stunner water table.

SPA Citation

DAS/HTR June 1992

CITATION 4

Register of European sites

Register entry UK0013011 under Regulation 11 of the Conservation (Natural Habitats, &c.) Regulations 1994

This is the register entry for the European site known as **Ouse Washes** in the Region of **Cambridgeshire, Norfolk**. This area has been designated by the Secretary of State for Environment, Food and Rural Affairs pursuant to Article 4.4 of the "Habitats Directive" (Council Directive 92/43/EEC) as a Special Area of Conservation. The register reference number for this European site is UK0013011 and a folder, kept under this reference as part of this register, contains a map of the European site and a citation, both signed by me, giving the reasons for designation of the site as a Special Area of Conservation.

Other details of the European site are as follows:

Date designated as a Special Area of Conservation: 1 April 2005

Site centre location[1]

Longitude: 00 12 21 E

Latitude: 52 28 58 N

Area: 311.35

Priority status[2]: No

Date of registration: 14 June 2005

Signed:

on behalf of the Secretary of State for Environment, Food and Rural Affairs

[1] This indicates the approximate centre of the site. Where the European site consists of several distinct areas, the co-ordinates of the most important sub-area are entered.

[2] Indicates whether the site has been identified under Article 4.2 of the Habitats Directive (Council directive 92/43/EEC) as hosting one or more priority natural habitat types or priority species.

Picture 14.1

CITATION 5

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name:	Ouse Washes
Unitary Authority/County:	Cambridgeshire, Norfolk
SAC status:	Designated on 1 April 2005
Grid reference:	TL498895
SAC EU code:	UK0013011
Area (ha):	311.35
Component SSSI:	Ouse Washes SSSI

Site description:
The Ouse Washes is one of the country's few remaining areas of extensive washland habitat. The associated dykes and rivers hold a great variety of aquatic plants; the pondweeds *Potamogeton* spp. are particularly well represented. The associated aquatic fauna is similarly diverse and includes spined loach *Cobitis taenia*. The Counter Drain, with its clear water and abundant aquatic plants, is particularly important, and a healthy population of spined loach is known to occur.

Qualifying species: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following species listed in Annex II:

- Spined loach *Cobitis taenia*

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0013011
Date of registration: 14 June 2005
Signed:
On behalf of the Secretary of State for Environment, Food and Rural Affairs

ENGLISH NATURE

Ouse Washes SAC UK0013011
Compilation date: May 2005 Version: 1
Designation citation Page 1 of 1

Picture 14.2