



Oxford Core Strategy Habitats Regulations Assessment

**Updated version
July 2009**



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1. INTRODUCTION

Oxford City Council have undertaken this Habitats Regulations Assessment “in-house”, with auditing undertaken by Levett-Therivel Sustainability Consultants. This report discusses Stage 1 (screening) and Stage 2 (appropriate assessment).

1.1 Requirements of the Habitats Directive

Appropriate assessment of plans that could affect Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites (jointly called ‘European sites’) is required by article 6(3) of the European Habitats Directive¹, which states:

‘Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.’

Article 6(4) of the Habitats Directive discusses alternative solutions, the test of “imperative reasons of overriding public interest” (IROPI) and compensatory measures:

If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

The Habitats Directive applies the precautionary principle to European sites. Plans and projects can only be permitted if it can be shown that they will have no significant adverse effect on the integrity of any European site, or if there are no alternatives to them and there are imperative reasons of overriding public interest as to why they should go ahead. In such cases, compensation will be necessary to ensure the overall integrity of the site network.

The Habitats Directive was implemented into UK legislation through the “Conservation (Natural Habitats, & c) Regulations 1994” (as amended). This piece of legislation is generally known as the Habitats Regulations.

1.2 Methodology Used for this Habitats Regulations Assessment

Habitats Regulations Assessment can involve up to a four stage process:

1. **Screening.** Determining whether a plan ‘alone, or in combination’ is likely to have a significant effect on a European site.
2. **Appropriate Assessment.** Determining whether, in view of the site’s conservation objectives, the plan ‘alone or in combination’ would have an adverse effect (or risk of this) on the integrity of the site. If not, the plan can proceed.

¹ Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora

3. **Assessment of alternative solutions.** Where the plan is assessed as having an adverse effect (or risk of this) on the integrity of a site, there should be an examination of alternatives.
4. **Assessment where no alternative solutions remain and where adverse impacts remain.**

This HRA covers Stages 1 and 2 of this process. The two stages were carried out between July 2007 until ~~September 2008~~ [May 2009](#). Broadly, the HRA process involved:

- Identification of European sites that could possibly be affected by Oxford's Core Strategy, qualifying features of those sites and, where available, key environmental conditions to support the sites' integrity;
- Identification of possible impacts arising from the Oxford Core Strategy
- Draft identification of impacts and sites that could be screened out, and those that were likely to require more detailed appropriate assessment;
- Consultation with English Nature to confirm that the proposed approach for the Appropriate Assessment was acceptable, and what additional information was required to complete the analysis;
- Collection of more detailed data from a wide variety of sources;

This report discusses stage 1 (screening), and stage 2 (appropriate assessment).

2. SCREENING

2.1 European Sites

Table 2.1 lists all European sites that are within 20km of the boundary of Oxford City Council.

Table 2.1 European sites within 20km of Oxford City Council boundary

Name of Site	Distance from boundary	Reason for Designation ²
Oxford Meadows SAC	Within City Boundary, extending into administrative area for Cherwell District Council and into the administrative boundary of West Oxfordshire District Council.	<p>Annex I habitats that are a primary reason for selection of this site Oxford Meadows represents lowland meadows in the Thames Valley centre of distribution. The site includes vegetation communities that are perhaps unique in the world in reflecting the influence of long-term grazing and hay-cutting on lowland meadows. The site has benefited from the survival of traditional management, which has been undertaken for several centuries, and so exhibits good conservation of structure and function.</p> <p>Annex II species that are a primary reason for selection of this site Oxford Meadows is selected because Port Meadow is the larger of only two known sites in the UK for creeping marshwort <i>Apium repens</i>.</p>
Cothill Fen SAC	Located 7 kilometres from the city boundary	<p>Annex I habitats that are a primary reason for selection of this site This lowland valley mire contains one of the largest surviving examples of alkaline fen vegetation in central England, a region where fen vegetation is rare. The M13 <i>Schoenus nigricans</i> – <i>Juncus subnodulosus</i> vegetation found here occurs under a wide range of hydrological conditions, with frequent bottle sedge <i>Carex rostrata</i>, grass-of-Parnassus <i>Parnassia palustris</i>, common butterwort <i>Pinguicula vulgaris</i> and marsh helleborine <i>Epipactis palustris</i>. The alkaline fen vegetation forms transitions to other vegetation types that are similar to M24 <i>Molinia caerulea</i> – <i>Cirsium dissectum</i> fen-meadow and S25 <i>Phragmites australis</i> – <i>Eupatorium cannabinum</i> tall-herb fen and wet alder <i>Alnus spp.</i> wood.</p>
Little Wittenham SAC	Located 19km from the City Boundary	<p>Annex II species that are a primary reason for selection of this site One of the best-studied great crested newt sites in the UK, Little Wittenham comprises two main ponds set in a predominantly woodland context (broad-leaved and conifer woodland is present). There are also areas of grassland, with sheep grazing and arable bordering the woodland to the south and west. The River Thames is just to the north of the site, and a hill fort to the south. Large numbers of great crested newts <i>Triturus cristatus</i> have been recorded in the two main ponds, and research has revealed that they range several hundred metres into the woodland blocks.</p>

² Source: www.jncc.gov.uk

2.2 Appropriate Assessment of the South East Plan

An HRA for Draft South East Plan has already been carried out by Scott Wilson and Levett-Therivel³ The South East Plan will set out the spatial strategy for the region and the Oxford Core Strategy must conform to this document in its final adopted form. The findings of the accompanying HRA are therefore highly relevant to the HRA of the Oxford Core Strategy. However, it focused on information and impacts considered appropriate at the regional level. For example, rather than focusing on information and impacts relating to the specific location of future development, the assessment has addressed bigger issues such as air pollution and water abstraction across the region. The document states that in many instances the impacts are not inevitable but rather depend on how the South East Plan's policies and proposals are implemented on the ground.

The HRA of the Oxford Core strategy brings down the level of HRA to an Oxford wide level. It will may be necessary for future planning applications to consider the impact at an individual site level.

The HRA of the Draft South East Plan concluded that there were a number of possible impacts 'for which it was not possible to conclude' that there would be 'no adverse effect' on the Oxford Meadows SAC due to developments under the South East Plan, either alone or in combination with other plans or projects. These included:

- Increased water abstraction;
- Increased effluent discharge;
- Reduced air quality;
- Increased primary aggregate requirements.

2.3 Oxford Core Strategy

The Oxford Core Strategy provides for:

- 8,000 new dwellings to be provided until 2026;
- 4,500 class B jobs to be provided until 2026;
- Release of safeguarded land for employment (Peartree/Northern Gateway) and residential (Barton), with a contingency site at Summertown;
- Green Belt review to release land for mixed-use residential development of at least 4,000 new homes to the south of the city, in land under administrative jurisdiction of South Oxfordshire District Council;
- Redevelopment of the Western side of the City centre through an AAP (West End Area Action Plan)

Table 2.2 shows likely key environmental considerations that are likely to give rise to significant effects as a result of policies in the Oxford City Council Core Strategy. Natural England recommended that the effects of the Core Strategy elements be categorised in the form of a schedule. The schedule provided by Natural England is as follows:

³ http://www.southeast-ra.gov.uk/southeastplan/key/appropriate_assessment.html (October 2006) and <http://gose.limehouse.co.uk/portal/rss/pcc/sahra> (July 2008)

Categorisation of the effects of the elements of the Core Strategy

- A – Policies and proposals that cannot have any negative effect on a European site
- B – Effects will be addressed in assessments “down the line”, including project assessment under regulation 48
- C – Could have an effect, but would not be likely to have a significant (negative) effect (alone or in combination with other plans or projects)
- D – Likely to have a significant effect alone and would require Appropriate Assessment
- E – Likely to have a significant effect in combination with other plans or projects and which require appropriate assessment of those combinations
- F – Likely to have a significant effect, alone or in combination with other plans or projects, but which would not adversely affect the integrity of a European site
- G – Likely to have a significant effect, alone or in combination with other plans or projects, and for which it cannot be ascertained that they would not adversely affect the integrity of a European site

Table 2.2 showing the likely key environmental considerations that are likely to give rise to significant effects as a result of policies in the Oxford City Council Core Strategy

Policy	Categorisation of the effects of elements of the Core Strategy*	If policy has no effect, then reasons why.	Key environmental considerations likely to give rise to significant effects
CS1 Hierarchy of centres	A-C	Policy promoting development that attracts large numbers of people in the City centre (in line with the sequential test). Policy promoting development of an appropriate size and scale for the district centres and neighbourhood centres. Summertown is still allocated as a District Centre, as such development of an appropriate scale will be encouraged here.	Summertown is already well developed, so any development (other than the strategic site - dealt with separately) is likely to be on Brownfield land. As such, any effect would likely to be minor.
CS2 Previously Developed and Greenfield Land	A (Impact of greenfield development assessed alongside relevant individual options, i.e., Northern Gateway, Summertown etc.)	Policy focusing development primarily on previously developed land and steering it towards greenfield land only where it is specifically allocated in the Core Strategy. By seeking to make efficient use of previously developed land, the policy helps to reduce pressures on greenfield land and to steer development away from the Oxford Meadows SAC	
CS3 Regeneration Areas	A	Spatial policy promoting regeneration in five key areas across the City. These five areas are all located on the eastern side of the City (either the north-east or south-east) and are therefore a considerable distance from the Oxford Meadows SAC	
CS4 Green Belt	B/D	Policy broadly protecting the Green Belt, apart from small-scale reviews to be carried out in appropriate Development Plan Documents.	Small scale review of the Green Belt at the Northern Gateway could involve the release of land south of the A40 for development, which could potentially involve development only 200 metres from the Oxford Meadows SAC. Issues arising from this are addressed through the relevant policy considerations below (e.g., Northern Gateway, land at Summertown)
CS5 West End	A-E	Development of 800 houses and 2ha of employment development. West End Area Action Plan now adopted, however in-combination effects are possible. Likely effects considered in relation to overall housing growth for the City.	
CS6 Northern Gateway	B/D	Policy promoting a strategic site for predominantly employment based development (closest point is 500m away from the SAC)	Site is a minimum of 500 metres from the Oxford Meadows SAC, on higher ground, but could potentially be a source of groundwater to the Oxford Meadows SAC Part of the site could be developed for housing. This could increase recreational pressure as well as groundwater pollution issues.
CS7 Land at Barton	A	Policy promoting a strategic site for predominantly residential development. Site is located 3.7 km from the Oxford Meadows SAC, therefore the policy helps to steer development away from European sites	

CS8 South Oxford SDA	A-B/E (Transport options assessed separately at AA stage)	Policy promoting partnership working in order to bring forward a strategic development area for at least 4,000 new houses to the south of the city (approx 6.5km away from the SAC)	Would not have any direct impact on the Oxford Meadows SAC given its location on the opposite side of the City, some 6.5 km from the boundary of the SAC. However, it is likely to increase pressures on the strategic road network in and around Oxford, including the A34, which runs through the Oxford Meadows SAC. Although this will be considered in more detail through transport modelling for the transport options.
CS9 Land at Summertown	C-B/E	Policy protecting land at Summertown for residential development should there be an inadequate number of housing sites to meet housing targets provided in the RSS	At the closest point the land is 1400 metres from the Oxford Meadows SAC. Could possibly affect drainage or increase recreational pressure.
CS10 Energy and Natural Resources	A	Policy for ensuring energy and natural resources are minimised in development proposals	
CS11 Waste and Recycling	A	Spatial planning policy promoting that developments have regard to the Waste Management Hierarchy during their design construction and operation. Policy also supports appropriately located development that makes provision for the management and treatment of waste. Responsibility for the identification of specific sites for waste facilities lies with Oxfordshire County Council. Sites will be identified in Oxfordshire County Council's Minerals and Waste Development Framework and Waste Sites DPD	
CS12 Flooding	A	Policy protecting development proposals from flood risk	
CS13 Biodiversity	A	Hierarchical policy promoting protection of designated sites, including the SAC	
CS14 Supporting new access to development	B/D		Air Pollution as a result of increased pressure to use A34.
CS15 Supporting city-wide movement	A B/D	Policy promotes various proposals to improve accessibility to and between the city and district centres by non-car modes. By promoting public transport, cycling and walking, and a Low Emissions Strategy for the city, the policy should help reduce air pollution.	Air Pollution as a result of increased pressure to use A34.
CS16 Primary Healthcare	A	Spatial planning policy to work with the PCT in provision of primary healthcare facilities. Developments mentioned in the Policy at Jericho and the West End are likely to be on previously developed land and to help reduce the need for travel by providing good quality health services close to residential populations.	
CS17 Access to Education	B/E A/C	Policy encouraging joint working with the LEA to improve access to education facilities throughout Oxford. Policy includes the possibility of new on or off-site primary education facilities at Summertown	Development of a new school at Summertown could possibly affect drainage

CS18 Infrastructure and Developer Contributions	A	Policy for timely delivery of infrastructure and developer contributions. Policy itself does not directly lead to development, but facilitates the infrastructure required to support development	
CS19 Urban design, townscape and the historic environment	A	Policy to assist in the protection of the unique character of Oxford	
CS20 Community Safety	A	Policy for the incorporation safety into the design of development proposals. Policy does not itself lead to development.	
CS21 Cultural and Community Development	A	Policy promoting cultural and community development in appropriate locations. Any such development is likely to be on previously developed land in existing built up areas.	
CS22 Green Space, Leisure and Sport	A	Policy seeking to maintain an average standard of recreation space across the city and supporting improvements to existing and opportunities for new facilities where appropriate. Policy should help reduce recreational pressures on Oxford Meadows SAC	
CS23 Level of Housing Growth	B/D	Policy stipulating levels of housing growth across the City. Target to achieve 8,000 new homes within city boundary by 2026. Estimated 400 new dwellings/ year	<p>New houses likely to increase recreational pressure on SAC where located close by (addressed through assessment of strategic sites above)</p> <p>Potential for increased water abstraction to impact on hydrology of SAC (groundwater flow)</p> <p>Potential for groundwater to become polluted should new residential development be located close by the SAC (groundwater pollution)</p> <p>Air quality associated with transport movements.</p>
CS24 Mix of Housing	A	Policy ensuring an appropriate and balanced mix of housing is provided as part of new developments. Policy does not itself lead to development	
CS25 Affordable Housing	A	Policy for determining the proportion of affordable housing to be accepted as part of qualifying developments. Policy does not itself lead to development.	
CS26 Student Accommodation	A	Policy limiting numbers of students taking up residence outside purpose built accommodation. Any new sites required for purpose-built student accommodation will be considered in the Site Allocations DPD.	
CS27 Accommodation for travelling communities	A	Criteria based policy according with national/ regional guidance to set the framework for site selection in other Development Plan Documents. Policy contains criteria to ensure sites respect areas of high conservation or ecological value	

CS28 Sustainable Economy	A (Issues relating to the Northern Gateway are addressed through policy CS7 above)	Policy seeking to achieve managed economic growth throughout Oxford. Policy allocates Northern Gateway, but raises no additional problems other than strategic site policy above	
CS29 Employment Sites	A	Policy protecting key and other employment sites from losses to other forms of development.	
CS30 The universities	C A	Policy promoting development by the universities is kept to existing sites.	Development on existing University of Oxford sites is likely to be on previously developed land. As such, any effect would likely to be minor.
CS31 Hospitals and medical research	A	Spatial Policy promoting the continued focussing of hospital-related development on existing sites in Headington/ Marston. Policy therefore steers development away from the Oxford Meadows SAC.	
CS32 Retail	C	Policy setting out the sequential test (spatially), Summertown is still allocated as a District Centre, as such development of an appropriate scale will be encouraged here.	Summertown is already well developed, so any development (other than the strategic site - dealt with separately) is likely to be on Brownfield land. As such, any effect would likely to be minor.
CS33 Sustainable tourism	A	Policy seeking to achieve longer stays and greater spends from tourists in Oxford. Policy encourages any development for additional short-stay accommodation to be on previously developed land – in the City centre and on Oxford's main arterial roads.	

* Uses Natural England's categorisation of effects. See page 6.

Key for Table 2.32

Policy unlikely to have significant effects cannot have any negative effect – policy screened out
Minor effects No likely significant effects – policy screened out
Effects uncertain, policy taken forward to stage 2 of HRA

2.4 Environmental Requirements of European Sites

Oxford Meadows SAC

The citation for the Oxford Meadows SAC states that:

Oxford Meadows includes vegetation communities that are perhaps unique in reflecting the influence of long-term grazing and hay-cutting on lowland hay meadows. The site has benefited from the survival of traditional management, which has been undertaken for several centuries, and so exhibits good conservation of structure and function. Port Meadow is the largest of only two known sites in the UK for creeping marshwort *Apium repens*.

Qualifying habitats: The site is designated under article 4 (4) of the Directive 992/43/EEC) as it hosts the following habitats listed in Annex I:

- Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)

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:

- Creeping marshwort *Apium repens*.'

Natural England's report on the condition of the Oxford Meadows constituent Sites of Special Scientific Interest indicates that currently the whole of the Oxford Meadows SAC is in a favourable condition.

The following key environmental requirements to support the Oxford Meadows SAC's integrity were identified at an HRA screening workshop carried out for the South East Plan:

1. Minimal air pollution.
2. Absence of nutrient enrichment of waters; good water quality.
3. Balanced hydrological regime – alteration to adjacent rivers may alter flooding regime and reduce botanical diversity.
4. Maintenance of traditional hay cut and light aftermath grazing.
5. Absence of direct fertilisation.

A further workshop on HRA for the Oxford Core Strategy was held on the 20th October 2006 at which the additional issues of ensuring that recreational pressures are maintained at a reasonable level and that the A34 does not need to be widened were also raised as issues that need to be addressed. The possible impact of promoting East-West rail has also been added for assessment.

Cothill Fen SAC

The citation for the Cothill Fen SAC states that:

This lowland valley mire contains one of the largest surviving examples of alkaline fen vegetation in central England, a region where fen vegetation is rare. The M13 *Schoenus nigricans* – *Juncus subnodulosus* vegetation found here occurs under a wide range of hydrological conditions, with frequent bottle sedge *Carex rostrata*, grass-of-Parnassus *Parnassia palustris*, common butterwort *Pinguicula vulgaris* and marsh helleborine *Epipactis palustris*. The alkaline fen vegetation forms transitions to other vegetation types that are similar to M24 *Molinia caerulea* – *Cirsium dissectum* fen-meadow and S25 *Phragmites australis* – *Eupatorium cannabinum* tall-herb fen and wet alder *Alnus* spp. wood.

Qualifying habitats: The site is designated under article 4 (4) of the Directive 992/43/EEC) as it hosts the following habitats listed in Annex I:

- Alkaline Fens
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) * Priority feature

The following key environmental requirements to support the Cothill Fen SAC's integrity were identified in HRA for the South East Plan:

- High water table.
- Calcareous, base-rich water supply
- Minimal air pollution.

Little Wittenham SAC

The citation for the Little Wittenham SAC states:

Little Wittenham comprises two main ponds set in a predominantly woodland context (broad-leaved and conifer woodland is present). There are also areas of grassland, with sheep grazing and arable bordering the woodland to the south and west. The River Thames is just to the north of the site, and a hill fort to the south. Large numbers of great crested newts *Triturus cristatus* have been recorded in the two main ponds, and research has revealed that they range several hundred metres into the woodland blocks.

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:

Great crested newts *Triturus cristatus*

No information was included about the environmental requirements for Little Wittenham in the South East Plan. However, the HRA for the South West RSS included the environmental requirements for sites that include great crested newts:

- Maintenance of habitat diversity including unshaded, medium sized ponds, and a variety of terrestrial habitat such as woodland, scrub and grassland, fallen branches, and piles of logs and stones to provide suitable resting, foraging and hibernation areas.
- Water quality and levels requires maintenance to support suitability as breeding ponds.
- Control or elimination of fish and invasive/alien aquatic plants may be required.

Natural England included the additional potential impact of recreational impacts since the area adjacent to Little Wittenham is a popular visitor area. The HRA therefore looks at potential additional recreational pressures for development proposed in the Oxford Core Strategy.

2.5 Possible impacts of the Oxford Core Strategy on the European Sites

Table 2.3 shows the policies that are likely to have an impact on the Oxford Meadows SAC and the likely nature, magnitude, location and extent of any impacts.

Table 2.3 Possible impacts of Oxford Core Strategy on Oxford Meadows SAC

Nature	Policies likely to have an impact on the SAC	Magnitude	Duration	Location	Conclusions
Air Pollution Impacts:	<ul style="list-style-type: none"> • Northern Gateway: Employment Growth at Peartree • SDA: at least 4,000 new dwellings by 2026 • Supporting access to new development • Supporting city-wide movement • Housing numbers 8,000 dwellings by 2026 (400 dwellings/ year) 	<p>Employment development at Northern Gateway could increase vehicle movements along the A34 which bisects the Oxford Meadows SAC</p> <p>An increase in housing numbers is likely to generate an increase in vehicle movements across Oxford, but also on the A34 which bisects the Oxford Meadows SAC</p>	<p>Throughout the Core Strategy Period</p> <p>Throughout the Core Strategy Period</p>	<p>The nearest boundary of the Northern Gateway Strategic development site is located approx. 500m to the North of the SAC.</p> <p>The proposed area of search for the Oxford SDA is over 6.5km away at the southern edge of the city.</p> <p>The SHLAA assesses all sites considered suitable for housing throughout Oxford. The nearest potential housing site to the Oxford Meadows SAC is Peartree.</p>	See section 3.1 for details.
Water quality impacts	<ul style="list-style-type: none"> • Northern Gateway: Employment Growth at Peartree • Green Belt • Housing numbers 8,000 dwellings by 2026 (400 dwellings/ year) • Land at Summertown • Access to education 	<p>Low/ not significant</p> <p>The level of housing development proposed by the Core Strategy is likely to generate a population increase of around 20,000 people. The total population of Oxford is around 150,000. This represents a potential increase of around 13%.</p>	<p>Throughout the Core Strategy period</p> <p>Throughout the Core Strategy Period</p> <p>(Land at Summertown dependent on site becoming available towards the end)</p>	<p>The nearest boundary of the Northern Gateway Strategic development site is located approx. 500m to the North of the SAC. Small scale review of the Green Belt at the Northern Gateway could potentially involve the release of land for development approx 200 metres from the Oxford Meadows SAC</p> <p>Mostly downstream of Oxford Meadows SAC as water is treated at treatment works in Sandford to the south of the city. Potentially pollution of groundwater in north Oxford could affect water quality at Oxford Meadows SAC</p>	See section 3.2 for details.

Nature	Policies likely to have an impact on the SAC	Magnitude	Duration	Location	Conclusions
Balanced hydrological regime	<ul style="list-style-type: none"> Northern Gateway: Employment Growth at Peartree Green Belt Land at Summertown Access to education Housing numbers 8,000 dwellings by 2026 (400 dwellings/year) 	<p>The level of housing development proposed by the Core Strategy is likely to generate a population increase of around 20,000 people. The total population of Oxford is around 150,000. This represents a potential increase of around 13%</p>	<p>Throughout the Core Strategy period.</p> <p>(Land at Summertown dependent on site becoming available towards the end)</p>	<p>The nearest boundary of the Northern Gateway Strategic development site is located approx. 500m to the North of the SAC. Small scale review of the Green Belt at the Northern Gateway could potentially involve the release of land for development approx 200 metres from the Oxford Meadows SAC</p> <p>At the closest point the Summertown land is 1400 metres from the Oxford Meadows SAC, so could possibly affect drainage.</p>	See section 3.3 for details.
Recreational pressure	<ul style="list-style-type: none"> SDA: at least 4,000 new dwellings by 2026 Land at Summertown Northern Gateway West End Housing numbers 8,000 dwellings by 2026 (400 dwellings/ year) 	<p>Low/negligible</p> <p>Compared to the overall catchment area for Port Meadow, additional possible development at Summertown and Northern Gateway would have limited impact. The Core Strategy Strategic Housing Land Availability Assessment (SHLAA) states that there could be up to 200-500 new homes, with accompanying recreational space, built at Summertown, and up to 200 at Northern Gateway. 700-800 homes are proposed in the West End.</p> <p>The level of housing development proposed by the Core Strategy is likely to generate a population increase of around 20,000 people. The total population of Oxford is around 150,000. This represents a potential increase of around 13%.</p>	<p>Throughout the Core Strategy period</p> <p>(Land at Summertown dependent on site becoming available towards the end)</p> <p>West End up to 2016</p>	<p>SDA over 6.5km away on southern boundary of city.</p> <p>At the closest point the Summertown land is 1,400 metres from the Oxford Meadows SAC, so could possibly increase recreational pressure.</p> <p>The Northern Gateway strategic site is located approx 500 metres to the North of the SAC.</p> <p>At the closest point the West End area is some 800 metres from the southern end of the Oxford Meadows SAC.</p> <p>Oxford has a wealth of green infrastructure and open spaces.</p>	See section 3.4 for details.

Nature	Policies likely to have an impact on the SAC	Magnitude	Duration	Location	Conclusions
Maintenance of traditional hay cut and light aftermath grazing.	N/A. Core Strategy does not propose any policies that will alter the way that the site is managed.	None – related to activities directly at the site, which the Core Strategy will not affect.	Throughout the Core Strategy Period	Site management not impacted upon by Core Strategy	Core Strategy unlikely to have significant effects since what is proposed does not affect the maintenance of the site.
Absence of direct fertilisation					

Table 2.4 Possible impacts of Oxford Core Strategy on Cothill Fen SAC

Nature	Policies likely to have an impact on the SAC	Magnitude	Duration	Location	Conclusions
High water table.	<ul style="list-style-type: none"> SDA: at least 4,000 new dwellings by 2026 Housing numbers 8,000 dwellings by 2026 (400 dwellings/ year) 	Negligible/ nil.	Throughout the Core Strategy period	7km from the City Boundary.	Unlikely to be significant
Calcareous, base-rich water supply		Cothill Fen SAC is in a different river catchment from Oxford.		Cothill Fen SAC is in a relatively remote location. It can only be accessed by private car, or by local residents on foot.	Unlikely to be significant
Minimal air pollution		Air pollution impacts tend to be highly localised.		Given the distance from the site, unlikely to be significant impacts	
Recreational impacts		Recreational pressure likely to be slight as a result of the proposed development in the Oxford Core Strategy.		Unlikely to be significant	

Table 2.5 Possible Impacts of Oxford Core Strategy on Little Wittenham SAC

Nature	Policies likely to have an impact on the SAC	Magnitude	Duration	Location	Conclusions
Maintenance of habitat diversity including unshaded, medium sized ponds, and a variety of terrestrial habitat such as woodland, scrub and grassland, fallen branches, and piles of logs and stones to provide suitable resting, foraging and hibernation areas.	N/A. Core Strategy does not propose any policies that will alter the way that the site is managed.	None – related to activities directly at the site, which the Core Strategy will not affect.	Throughout the Core Strategy period	Little Wittenham SAC is Located 19km from the City Boundary	Core Strategy unlikely to have significant effects since what is proposed does not affect the maintenance of the site.
Water quality and levels requires maintenance to support suitability as breeding ponds.	<ul style="list-style-type: none"> • SDA: at least 4,000 new dwellings by 2026 • Housing numbers 8,000 dwellings by 2026 (400 dwellings/ year) 	Water levels are managed along the Thames. Water levels are controlled through locks and weirs to maintain a balanced flow throughout			Unlikely to be significant
Control or elimination of fish and invasive/alien aquatic plants may be required.	N/A. Core Strategy does not propose any policies that will alter the way that the site is managed.	None – related to activities directly at the site, which the Core Strategy will not affect.			Core Strategy unlikely to have significant effects since what is proposed does not affect the maintenance of the site.
Increased recreational pressures due to popular visitor area adjacent to the Little Wittenham SAC	<ul style="list-style-type: none"> • SDA: at least 4,000 new dwellings by 2026 • Housing numbers 8,000 dwellings by 2026 (400 dwellings/ year) 	A high level of green space is proposed to be maintained throughout Oxford. This will reduce the need to travel to other areas to enjoy green spaces. A survey into visitors at Little Wittenham SAC carried out in 2002 found that 10% of visitors were from Oxford.			Unlikely to be significant. Visitor data obtained from Northmoor Trust. Increase in visitors from Oxford likely to be between 320-400 year. South Oxfordshire DC contacted re: 'in-combination impacts'

2.6 Screening conclusions

Oxford Meadows SAC

Table 2.3 suggests that the Oxford Core Strategy could have significant impacts on the Oxford Meadows SAC with regard to the following:

- Air pollution;
- Water quality.
- Balanced hydrological regime; and
- Increased recreational pressure.

These are discussed further at Section 3.

It has been possible to screen out some of the impacts on the Oxford Meadows SAC:

- Maintenance of traditional hay cut and light aftermath grazing
- Absence of direct fertilisation

These have been screened out as they are related to activities directly at the site, which the Oxford Core Strategy will not affect.

Cothill Fen SAC

It is considered that the Oxford Core Strategy could not have an adverse impact on either Cothill Fen. Cothill Fen is an alkaline fen dependent on a high water table and calcareous, base-rich water supply. As Cothill Fen is in the catchment of the River Ock, which is in a different catchment, it could not have an adverse impact on this site. Cothill Fen is in a relatively remote location and can only be accessed by private car, or by local residents travelling on foot. Recreational pressure is therefore likely to be slight as a result of the proposed development in the Oxford Core Strategy. Development within Oxford, and the Strategic Development Area are likely to feature new green spaces, which will ease recreational pressure on the Cothill Fen. Given the results of table 2.4, a full appropriate assessment of this site is not required.

Little Wittenham SAC

Little Wittenham has been designated because it contains two ponds with large populations of great crested newts. [These areas have restricted access which is designed to prevent conflicts between the visiting public, the newts and their habitat.](#) As development in Oxford will not affect the habitat in the ponds or the newts foraging habitat around them, the Oxford Core Strategy could not have an adverse impact on this site. This site has therefore been excluded from further assessment in this screening exercise and the remainder of this document relates exclusively to the Oxford Meadows SAC.

Natural England noted that there could be additional recreational pressure as a result of the Oxford Core Strategy on the SAC at Little Wittenham as the area adjacent to the SAC is a popular visitor destination. Given the distance from the Little Wittenham SAC (19km from the city boundary), and the proposed standard in the citywide target of 5.75 ha of green space per 1,000 population as proposed in the Oxford City Green Space Strategy, it is unlikely that the level of population predicted as a result of the Oxford Core Strategy will have an adverse impact on the Little Wittenham SAC. [Visitor data obtained from the Northmoor Trust indicates that the increase in visitors from Oxford is likely to be only around 320-400 a year, based on current visitor patterns.](#)

The [South](#) Oxford Strategic Development Area (SDA) is on the southern edge of the City within the administrative area of South Oxfordshire District Council. As such any impacts associated with the development would need to be assessed by South Oxfordshire as part of their HRA/AA.

[The draft AA of South Oxfordshire District Council's Core Strategy concludes there is no risk of a significant effect arising as a result of the proposed population growth at Didcot or from the creation of new areas of accessible natural greenspace to the north east of Didcot. These conclusions take account of the fact that due to the restricted access policies which apply to the areas where newts are primarily found, increased visitor numbers will be concentrated onto other habitats on the reserve. These habitats are relatively unimportant in biodiversity terms and not related to the primary reasons for the selection of the SAC.](#)

[SODC's draft AA also notes that Great Crested Newts are not believed to be particularly sensitive to human disturbance provided their breeding ponds are not affected and their primary terrestrial habitat and hibernacula are not adversely affected. Provided controls on access to the most sensitive areas are maintained \(i.e. ponds and hibernacula are not disturbed\), it concludes that there is no reason to believe there would be any significant effect on the integrity of the site or the primary reason for the selection of the site.](#)⁴

Given the results in table 2.5, a full appropriate assessment of this site is not required.

3. APPROPRIATE ASSESSMENT

The following sections deal with each of the possible environmental requirements of the Oxford Core Strategy on the Oxford Meadows SAC, and the likelihood of 'in-combination' significant effects. Each of the environmental requirements is dealt with in turn:

- Air pollution
- Water quality
- Water levels
- Recreational pressure

In compliance with Article 6(3) of the Habitats Directive, the City Council must consider the implications of the Oxford Core Strategy for relevant sites 'in combination' with other plans or projects' that might have significant impacts on these sites. The following documents have therefore been considered:

- [Draft South East Plan, including the Panel Report \(August 2007\) and the Proposed Modifications by the Secretary of State \(July 2008\) and the final Plan \(May 2009\);](#)
- Oxford Local Plan 2001-2016 – although this document will eventually be superseded by the Local Development Framework, at present it sets out the City Council's adopted development control policies and development sites. It is therefore a plan that needs to be considered in this assessment.
- West Oxfordshire Local Plan 2011, and Core Strategy Issues and Options (March 2008) [and interim position statement \(February 2009\);](#)
- Vale of White Horse Local Plan 2011, and Core Strategy Issues and Options (November 2007) [and Preferred Options \(January 2009\);](#)
- Cherwell District Council's Core Strategy Issues and Options document (February 2006), [Supplemental Consultation on Site Allocations Issues and Options \(February 2008\) and Options for Growth \(September 2008\);](#)
- [South Oxfordshire Local Plan 2011, and Core Strategy Issues and Options \(November 2007\) and Preferred Options \(March 2009\)](#)

⁴ South Oxfordshire District Council, Draft Appropriate Assessment of South Oxfordshire District Council's Core Strategy, (June 2008)

- Oxfordshire Minerals and Waste Development Framework – Minerals Sites Development Plan documents;
- Oxford Flood Risk Management Study Scoping Consultation Paper (June 2005) [and Consultation Draft Oxford Flood Risk Management Strategy \(Spring 2009\)](#);
- Catchment Management Plan

3.1 Air Pollution

Baseline situation

A desk-based review of available information has been carried out. As part of this review, data provided by the Air Pollution Information Service was analysed in order to determine whether there would be any likely significant effects (i.e., whether or not the critical load for [Nitrogen \(N\)](#) deposition would be breached) as a result of the policies and proposals in the Core Strategy. It is worth noting at this stage, that N deposition (arising from [Nitrogen Oxides \(NO_x\)](#)) is the main pollutant arising from vehicle traffic, as such it has been given full consideration in this section of the report. [Sulphur dioxide \(SO₂\)](#) is considered to be the main pollutant from coal-fired power stations and ports, and as such it is not considered to have a significant effect on the SAC.

[The percentage of total sulphur dioxide emissions from road transport is very low. In fact, a report from the Department for Transport in 1999⁵ stated that 2% of total sulphur dioxide emissions came from road transport.](#)

The Air Pollution Information Service shows air pollution at 2003 and then projected forward to 2010 for the Oxford Meadows SAC. For the Oxford Meadows SAC, data is provided in relation to N deposition, and S deposition only for these dates.

Table 3.1 shows where air pollution levels at Oxford Meadows SAC exceeded the site's critical load in 1999/2000. Pollution levels were within the critical load for acid deposition, ammonia, nitrogen deposition, [near capacity for](#) sulphur dioxide (SO₂); and [exceed critical load but near capacity](#) for ozone. [The primary pollutants which react to form ozone are often emitted many miles from locations where higher concentrations of the gas are experienced. Thus, the local authority for an area where an exceedance of the ozone objective occurred would be unable to influence levels significantly.](#)⁶ Environment Agency data from 2005 suggests that neither nitrogen nor acid thresholds are exceeded at Oxford Meadows SAC.

Critical loads represent the exposure below which there should be no significant harmful effects on sensitive elements of the ecosystem (according to current knowledge). [They](#) have been established for a number of habitats dependent on low nitrogen levels. Critical loads are expressed in deposition of units of kg/N/ha/yr.

⁵ DfT, (1999), The Environmental Impacts of Road Vehicles in Use, www.dft.gov.uk/pgr/roads/environment/cvtf/theenvironmentalimpactofroa3793

⁶ *ibid*

Table 3.1 showing where air pollution levels at Oxford Meadows SAC exceeded the site's critical load in 1999/2000.

pollutant	deposition / critical load
acid deposition	0.433
ammonia	0.163
N deposition	0.772
NOx	0.99
ozone	1.26
SO2	0.18

Source: <http://www.apis.ac.uk>

Key: deposition / critical load

<0.25	0.25-0.74	0.75-0.99	1-1.24	1.25-1.99	2+
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Note: The critical air pollutant loads that a given site can accommodate depends on the type of site. In this case, Oxford Meadow has been assumed to be unimproved hay meadow.

Table 3.2 shows data from the APIS website from 2003 (with predictions to 2010) for N deposition and S deposition, and their related critical loads.

Site and grid reference*	Habitat	Pollutant, measurement	Critical load range	Deposition** 2003	Deposition** 2010
Oxford Meadows	Lowland hay meadows	N deposition, kg/N/ha/yr	20-30	15.9	13.9
		S deposition, Keq/ S/ ha/ yr	3.88-3.89	0.48	0.36

Note: The Site Relevant Critical Loads tool provides critical loads for acidity and nitrogen for designated features within an SAC or SPA site. A user can view an overview of each interest feature for each site. Critical loads will be assigned to each feature if it is sensitive to either nutrient nitrogen or acidity. (Source: www.apis.ac.uk)

* From <http://www.jncc.gov.uk/page-1458>

** Estimated to 2010

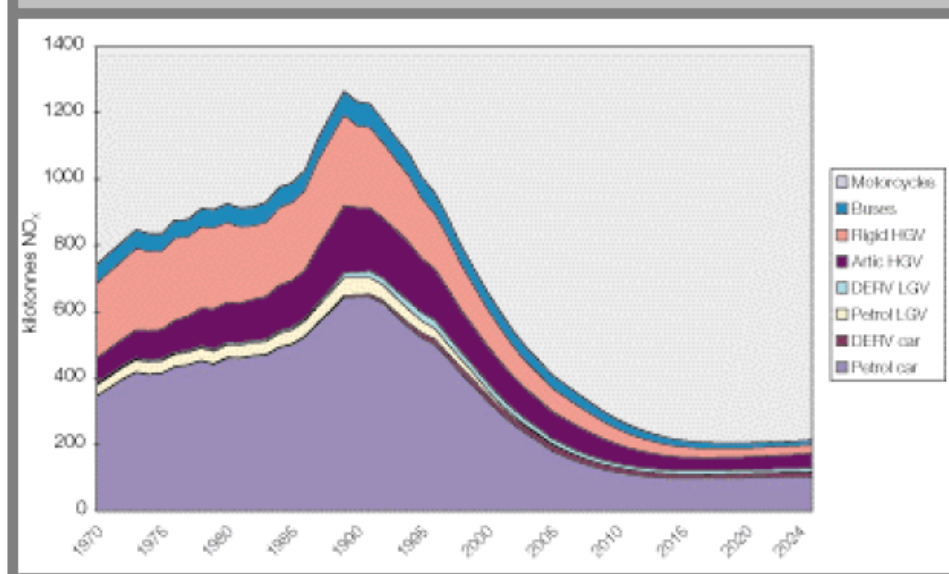
Key:

Deposition within critical load range	Deposition exceeds critical load range by 25-100%
Deposition exceeds critical load range by <25%	Deposition exceeds critical load range by >100%

The Air Pollution Information Service (APIS) website gave two scenarios for measuring the different pollutants at the SAC. The first was a baseline of 2003. The second was an extrapolated estimate to 2010. The 2010 scenario has been used in this instance. Chart 3.1 below shows the likely deposition of Nitrogen by source, at the Oxford Meadows SAC in 2010. NOx levels throughout the UK are expected to drop until about 2020 due to improvements in vehicles' Euro standards and reductions in power station emissions. [Table 3.3 below shows the National NO_x emissions reductions as a result of road transport up to 2025. This chart shows a steep decline in emissions from 1990.](#)

[The critical level for Nitrogen Dioxide is 30µg/m³. According to the APIS website, actual NO_x levels are 29.7 µg/m³. The APIS data is based on a 5km square and as such does not necessarily represent the specific localised impacts associated with Nitrogen dioxide and nitrogen deposition. The APIS website suggests that, "where this method suggests likely](#)

Table 3.3 National NO_x emissions from road transport 1970-2025



Source: Department for Transport report (1999) [The Environmental Impacts of Road Vehicles in the UK](#).

[significant pollutant impact, a detailed site-based assessment should be conducted.” Detailed site based assessments have been carried out at Binsey, OS Grid reference – 449123 207693. A monitoring site has been measuring background levels of nitrogen dioxide since 1995. Table 3.4 shows the background levels of nitrogen dioxide.](#)

Table 3.4 – Background Nitrogen dioxide levels at Binsey, measured in $\mu\text{g}/\text{m}^3$.

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
26.3	25.9	21.5	17.7	17.2	18.0	19.4	16.4	18	16	16	15	13	13

Source: [Oxford City Council monitoring data](#).

[Table 3.4 clearly shows that at present, the actual levels of nitrogen dioxide are well within the critical load specified for the type of habitat on site.](#)

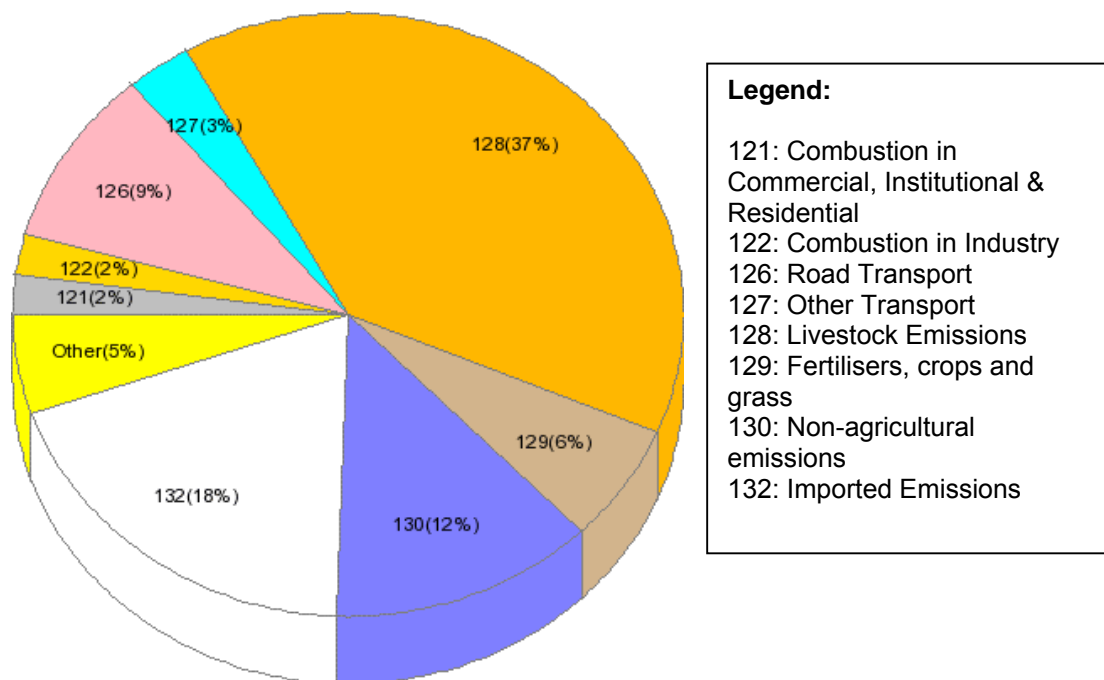
[Air quality monitoring has also been undertaken even closer to the A34 by the Highways Agency, as part of the Environmental Assessment Report for the A34 Wolvercote Viaduct Replacement scheme. This monitoring showed that only at a point 15 metres from the A34 did levels of Nitrogen Dioxide exceed \$30 \mu\text{g}/\text{m}^3\$ and then only by \$2.9 \mu\text{g}/\text{m}^3\$. Measurements taken 30 metres and greater from the A34 showed below critical levels of Nitrogen Dioxide \(see Table 3.5 below\). This monitoring was undertaken in 2007, and therefore if levels of Nitrogen Dioxide in this location have followed the national downward trend mentioned above, it could be expected that concentrations will have reduced between 2007 and the current time.](#)

Location	Measurement Site	X Coord	Y Coord	Data Capture (Months)	6 Monthly Period Mean	Annual Mean Nitrogen Dioxide Concentration
1	St Ebbes	451172	205391	6	24.0	21.8
2	St Ebbes	451172	205391	6	25.2	22.9
3	St Ebbes	451172	205391	6	26.4	24.1
4	Meadow behind Wolvercote House	448989	210074	6	25.3	23.0
5	A34 Transect 15m	448671	210236	6	36.1	32.9
6	A34 Transect 30m	448659	210147	6	30.0	27.3
7	A34 Transect 50m	448647	210157	6	27.2	24.7
8	A34 Transect 120m ^a	448626	210223	4	27.5	25.0
9	Hotel ^b	449676	210169	4	37.0	33.6
10	East of Viaduct along Oxford Canal	449049	210359	6	30.8	28.0
11	West of viaduct along Oxford Canal	448990	210400	6	33.2	30.2
12	A34 Transect 130m	448596	210245	4	22.9	20.9

Table 3.5 – Annual Mean Measure Nitrogen Dioxide concentrations at various diffusion tube sites in the vicinity of the A34 at Wolvercote (source: Highways Agency (2007), Part 1 Environmental Assessment Report; A34 Wolvercote Viaduct Replacement)

Nitrogen deposition and the effects of Nitrogen Oxides are highly localised. See below for information regarding dispersal of nitrogen based pollutants.

Figure 3.1 showing N deposition by source at Oxford Meadows SAC in 2010:



Possible impact of the Core Strategy

Nitrogen deposition has been focused on here as it is one of the key indicators from the APIS website.

Nitrogen Dioxide is taken up by plants principally through their stomata. Concentrations of Nitrogen Dioxide are higher close to roads so vegetation in these areas is exposed to a larger source of nitrogen. The Environment Agency's advice⁷ on traffic related pollution is that it needs to be considered if a road carrying a significant proportion of new traffic related to a plan runs within 200 metres of a European site. In the case of the Oxford Core Strategy, this will generate additional new traffic that will pass along the A34 through the Oxford Meadows SAC.

Interim Advice Note 61/05 (Guidance for Undertaking Environmental Assessment of Air Quality for Sensitive Ecosystems in Internationally Designated (Nature Conservation Sites and SSSIs) provides information about Nitrogen Deposition, as well as Nitrogen Oxides (NO_x) emissions at the local scale. Interim Advice Note 61/05 states that:

If there is a Designated Site within 2km of a scheme so that an Appropriate Assessment is required, but there is no significant change in emissions from roads within 200m of the site, then the scheme will not result in a significant change in air quality and the effects of a change in air quality can be assumed to be negligible.

Chart 3.1 shows a small percentage of the total N deposition at Oxford Meadows SAC can be attributed to housing, employment and transport – the issues covered by spatial planning. The following sources are all considered to contribute to the deposition of Nitrogen under the 2010 scenario:

121: Combustion in Commercial, Institutional & Residential (2%)
122: Combustion in Industry (2%)
126: Road Transport (9%)
127: Other Transport (3%)
Other (5%)

It was considered necessary to include the "other" category as this could include NO_x emissions, which would be likely to result in N deposition.

As a total percentage the total amount of N deposition at the Oxford Meadows SAC that is attributable to spatial planning under the 2010 scenario would be **21%**. Existing Oxford residents are only responsible for part of this, and the Oxford Core Strategy would increase the number of homes in Oxford by about 13%. Even using a very precautionary approach, assuming that (as a very worst case scenario), that N deposition attributable to the Oxford Core Strategy doubles, total N deposition (using this scenario) at the Oxford Meadows SAC would increase by 21% from 13.9 kg/N/ha/yr to 16.8 kg/N/ha/yr. This figure is still within the critical load range for the site.

Given this desk-based analysis, Air Pollution impacts (particularly N deposition) as a result of the Oxford Core Strategy are unlikely to have a significant effect on the Oxford Meadows SAC. [It is acknowledged that the proposed Northern Gateway employment-led regeneration could have an impact on the strategic highway network, which already experiences significant peak hour congestion. Modelling has been undertaken of the transport impacts of the Core Strategy using Oxfordshire County Council's Central Oxfordshire Transport Model. This modelling has recently been updated to take account of other developments proposed in the county.](#)

[Draft outputs shown below indicate that north of Peartree interchange, the A34 will experience a large increase in traffic, both in relative and absolute terms. In the morning peak, the select link analysis suggests that the Northern Gateway and developments elsewhere in Oxford attract](#)

⁷ English Nature (16 May 2006) letter to Runnymede Borough Council, 'Conservation (Natural Habitats &c.) Regulations 1994, Runnymede Borough Council Local Development Framework

relatively small numbers of trips with the vast majority of the additional trips coming from sources external to Oxford. Trips originating from Oxford in the AM peak actually reduce, as do the trips travelling back to Oxford in the PM peak. The A34 south of Oxford would experience more than a 10% growth in trips during the AM peak, with a much larger increase of almost 27% in the PM peak. Table 3.6 below shows the draft model outputs relating to the A34. It should be noted that these outputs model a 'worst case' scenario to 2026.

	Site/Zone	AM new peak hour trips	% of total new trips	% of total trips	PM new peak hour trips	% of total new trips	% of total trips
From	Barton	7	0.4%	0.1%	1	0.0%	0.0%
	Northern Gateway	21	1.3%	0.3%	339	14.5%	5.0%
	South Oxford SDA	3	0.2%	0.0%	6	0.2%	0.1%
	Oxford	-109	-6.7%	-1.5%	273	11.7%	4.1%
	Outside Oxford	1692	104.8%	23.8%	1714	73.5%	25.5%
	Total new trips	1615	100.0%	22.7%	2332	100.0%	34.7%
To	Barton	1	0.1%	0.0%	0	0.0%	0.0%
	Northern Gateway	154	9.5%	2.2%	20	0.9%	0.3%
	South Oxford SDA	-7	-0.4%	-0.1%	3	0.1%	0.0%
	Oxford	163	10.1%	2.3%	-100	-4.3%	-1.5%
	Outside Oxford	1303	80.7%	18.3%	2408	103.3%	35.8%
	Total new trips	1615	100.0%	22.7%	2332	100.0%	34.7%

	Site/Zone	AM new peak hour trips	% of total new trips	% of total trips	PM new peak hour trips	% of total new trips	% of total trips
From	Barton	4	0.4%	0.1%	-2	-0.1%	0.0%
	Northern Gateway	0	0.0%	0.0%	197	8.3%	2.2%
	South Oxford SDA	12	1.1%	0.1%	11	0.5%	0.1%
	Oxford	-509	-49.0%	-6.3%	-173	-7.3%	-2.0%
	Outside Oxford	1533	147.4%	19.0%	2333	98.6%	26.4%
	Total new trips	1040	100.0%	12.9%	2365	100.0%	26.7%
To	Barton	-11	-1.0%	-0.1%	15	0.6%	0.2%
	Northern Gateway	227	21.8%	2.8%	18	0.8%	0.2%
	South Oxford SDA	13	1.3%	0.2%	20	0.8%	0.2%
	Oxford	246	23.7%	3.1%	9	0.4%	0.1%
	Outside Oxford	564	54.2%	7.0%	2303	97.4%	26.0%
	Total new trips	1040	100.0%	12.9%	2365	100.0%	26.7%

Table 3.6 – Select link analysis of traffic growth on the A34 to 2026 (source: Halcrow (June 2009), Draft Technical Note; Addendum to Oxford City LDF testing)

The City Council is working in partnership with the Northern Gateway Consortium, the Highways Agency and Oxfordshire County Council to evaluate in detail the transport impacts of the Northern Gateway proposals and to develop a mitigation strategy. The main conclusions of work so far are:

- background growth in traffic at Peartree without development is likely to significantly worsen congestion. It is likely however that a scheme can be found to improve the local road network and junctions that would prevent any worsening of congestion and improve public transport reliability, whilst accommodating the new development;

- A base model for assessing the traffic impact of the proposed development has been broadly agreed and validated;
- The need for a robust approach to travel demand management has been recognised, and a full Travel Plan will be developed that incorporates various 'hard' and 'soft' measures to influence travel behaviour.

Further air quality monitoring will be undertaken in support of the Northern Gateway Area Action Plan to assess if there would be any very specific localised impacts arising from the proposed Northern Gateway development. This modelling will focus on areas of the SAC immediately adjoining the A34.

Possible 'In combination' impacts

Development of 55,200 new homes in Oxfordshire, as proposed in policy H1 of the ~~draft~~ South East Plan, and 80,000 new homes and 2 million square metres of new business floorspace in South Hampshire, as proposed in policies H1 and SH3 of the ~~Proposed Changes to the~~ South East Plan, is likely to increase traffic levels on the A34 and cause reduced air quality.

Transport modelling undertaken using Oxfordshire County Council's Central Oxfordshire Transport Model shows significant increases of traffic levels in and around Oxford by 2026, although much of this is attributed to development outside Oxford. For instance, the model shows AM peak trip growth of 42% on the network in the 'do nothing' scenario (i.e. without the Oxford Core Strategy proposals), compared to 46% and 49% growth in trips under the Core Strategy low and high growth scenarios. For the PM peak, there would be a 40%, 43% and 47% increase in trips in the do nothing, low growth and high growth scenarios⁸

However, the HRA for the RSS for the South East that:

“Research by AEA Technology suggests that background air quality throughout the UK will improve very significantly over the next 10-15 years, primarily as a result of tightening Euro emission standards for cars and lorries, and cleaner energy generation⁹. The model used does not include the higher housing figures being proposed in various RSSs, nor recent government proposals for new power stations (for instance it assumes that the number of fossil fuel burning power stations will decrease from 23 in 2005 to 12 in 2010 and 5 in 2020). Even if the new stations use 'clean coal' technology as proposed, these will still have some impact on air quality. A recent DEFRA study¹⁰ also suggests that assumptions about vehicle emissions should add 15% to Euro emission standards to take account of real-world effects such as poor maintenance, low tyre pressure, poor driving, and increasing use of air conditioning. DEFRA's Air Quality Expert Group (2007) “*recommends that local authorities, and any other users of the future-year adjustment factors, currently provided by Defra to adjust monitoring data, should*

⁸ Halcrow (2009), Oxford City LDF Testing Version 2, available at <http://www.oxford.gov.uk/planning/CSdocuments.cfm> (CD5/11)

⁹ Grice, S. et al (2006). *Baseline projections of air quality in the UK for the 2006 review of the Air Quality Strategy*, report to Defra et al [online] available at: http://www.airquality.co.uk/archive/reports/cat16/0604041040_baselineprojectionsreport5.pdf (accessed 14 May 2008); and Grice, S. et al. (2007). *Updated projections of air quality in the UK for base case and additional measures for the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007*, report to Defra et al [online] available at: http://www.airquality.co.uk/archive/reports/cat17/0707171116_newbaselineandadditionalmeasuresreport_v6.pdf (accessed 14 May 2008).

¹⁰ Defra (2007). *Passenger transport emissions factors: Methodology paper* [online] available at: <http://www.defra.gov.uk/environment/business/envrpf/pdf/passenger-transport.pdf> (accessed 14 May 2008).

exercise caution, as actual decreases in NO₂ concentrations at some sites may be considerably smaller than those calculated using these adjustment factors”¹¹.

Nevertheless, one can assume that, in most parts of the region, future air quality to 2020 / 2025 will be better than today's. After that, air quality is expected to get worse because the increase in vehicle use will outweigh technical improvements; and because no further significant technical improvements are expected. In the longer term, shipping and aircraft emissions are also expected to increase significantly¹².”

As such, 'in combination' impacts are likely to be insignificant.

3.2 Water Quality

Baseline situation

Oxford Meadows SAC straddles the north western boundary of Oxford. Most of it is therefore upstream of the large urban areas of Oxford. However, a study of 'The Hydrology of the Oxford Meadows'¹³ states that 'The Second Terrace Gravels (Summertown Radley Terrace) on which much of Oxford is built appears to be a source of groundwater recharge (Eyles 1986) with groundwater/surface water flowing south and west across Port Meadow to the Seacourt Stream.'

[A full discussion of groundwater and the implications for the balanced hydrological regime at the Oxford Meadows SAC is discussed at Section 3.3. It is important to recognise that the groundwater recharge that occurs on the Second Gravel Terrace is separate from groundwater recharge and flow that occurs in the Alluvium at the Oxford Meadows SAC.](#)

Water quality is firmly within the remit of the Environment Agency and the Water companies. However, this report recognises the District Council's responsibilities under the Habitats Regulations, regulation 85B(4), to ensure that any plan or project which requires planning permission is approved after having ascertained that it will not adversely affect the integrity of a European site.

Possible impact of the Core Strategy

[The original version of the HRA stated that](#) the Core Strategy could affect water quality in two ways: 1. through pollution of the groundwater, and 2. through effluents from wastewater treatment works.

Pollution of groundwater in north Oxford. Given that most of the North Oxford gravel terrace is already developed, the impact on nutrient enrichment and water quality would probably not be significant. However, two strategic locations for development that have been identified are on the North Oxford gravel ridge, namely Pear Tree/Northern Gateway and land at Summertown. Pear Tree/Northern Gateway is only 500 metres from the Oxford Meadows at its closest point.

[The Second Terrace Gravels \(Summertown Radley Terrace\) on which much of Oxford is built appears to be a source of groundwater recharge \(Eyles, 1986\). Groundwater recharge is the hydrologic process whereby surface water returns to groundwater. A subsequent investigation](#)

¹¹ Air Quality Expert Group (2007) *Trends in primary nitrogen dioxide in the UK*, <http://www.defra.gov.uk/environment/airquality/publications/primaryno2-trends/pdf/executive-summary.pdf> (accessed 7 July 2008)

¹² J. Stedman and S. Grice, pers. comm., June 2008.

¹³ A. Dixon (2005) *The Hydrology of Oxford Meadows*

[undertaken by the Environment Agency¹⁴ provided a conceptual model of groundwater flow at and around the Oxford Meadows. This map is shown at Figure 3.2. Each of the sites, and their likely impact in relation to water quality on the Oxford Meadows SAC will be looked at in turn. The first to be considered is the land at Summertown.](#)

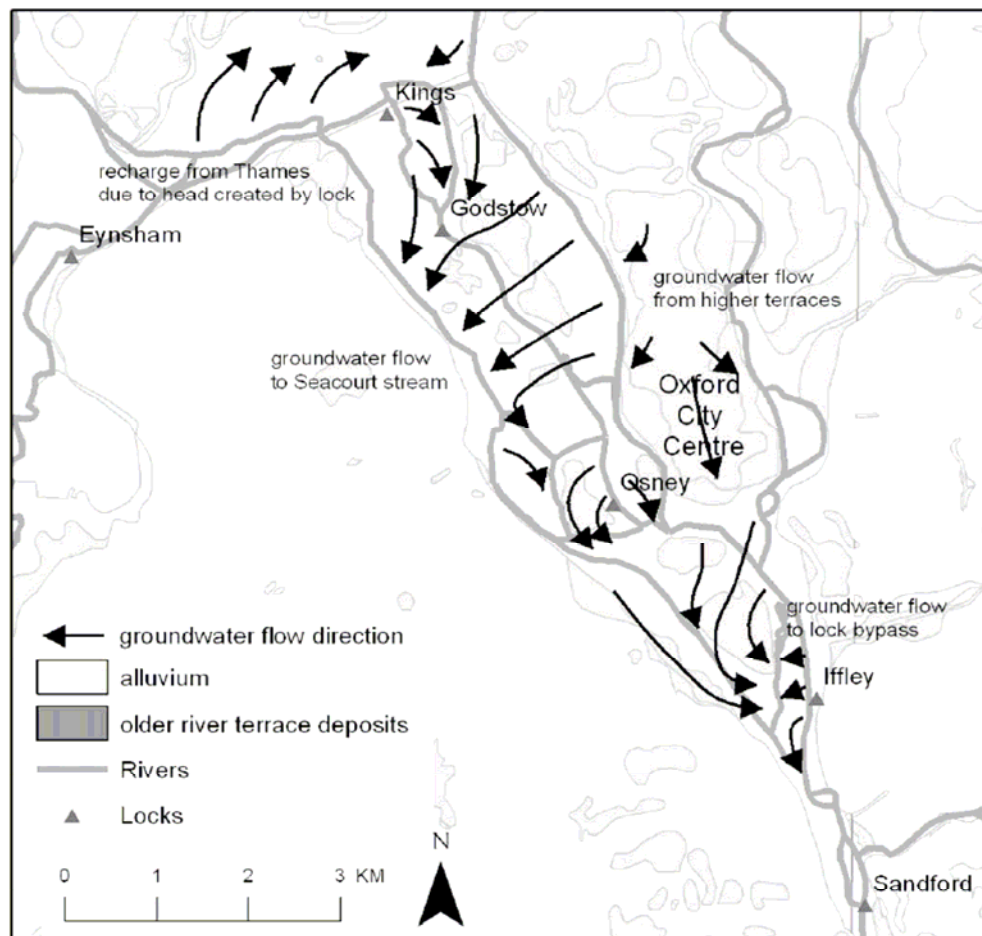


Figure 3.2: Conceptual groundwater flow model for Oxford (2007)

Source: D MacDonald, A Dixon, *et al.* (2007) Investigating the Interdependencies between surface and groundwater in the Oxford area to help predict to timing and location of groundwater flooding and to optimise flood mitigation measures. Presented at the 42nd Flood and Coastal Management Conference, York, 2007.

Part of the Summertown site lies on top of the Second Gravel Terrace. The groundwater model clearly shows the groundwater flow direction at the Summertown site moving in the opposite direction to the Oxford Meadows SAC. Therefore if the flow of groundwater is in the opposite direction to the Oxford Meadows SAC, from the Summertown site, water quality issues that affect the *A. repens* from the development of this site are likely to be insignificant.

It transpires that only a very small portion of the proposed strategic employment site at Peartree/ Northern Gateway sits on top of the Third Wolvercote Terrace Gravels. This is shown in Figure 3.3 which shows the geology of Oxford. However, the majority of the site is in fact on Oxford Clay, which is a non-aquifer. From the groundwater flow model above, it clearly shows

¹⁴ D MacDonald, A Dixon, *et al.* (2007) Investigating the Interdependencies between surface and groundwater in the Oxford area to help predict to timing and location of groundwater flooding and to optimise flood mitigation measures. Presented at the 42nd Flood and Coastal Management Conference, York, 2007.

that groundwater movement does not occur on the Peartree/ Northern Gateway site. Since the flow of groundwater does not flow to the Oxford Meadows SAC from the Peartree/ Northern Gateway site, water quality issues would be likely to be insignificant.

The potential for development at Peartree/ Northern Gateway and Summertown and the likelihood of significant effects as result of development at these two strategic locations has been discussed with the Environment Agency. The Environment Agency stated that: any potential impacts of loss of infiltration (and therefore loss of supply) as well as ensuring maintaining water quality can be significantly reduced by ensuring that suitable Sustainable Drainage techniques are used. An Area Action Plan for the site will investigate the precise type of sustainable drainage techniques to be employed.¹⁵

Oxford City Council Adopted Local Plan contains a policy that specifically deals with groundwater and water quality. Policy NE.13 deals with the prevention of surface or groundwater pollution. Oxford City Council Adopted Local Plan Policy NE.13 states:

Planning permission will only be granted for development that will not cause a deterioration in surface or groundwater quality. Appropriate measures to prevent pollution will be required. The applicant may be required to submit details of an investigation of the site and any precautionary measures, which are proposed. Precautionary measures will be secured through planning conditions or a planning obligation.

This policy has been saved, and will continue, until it is replaced by an equivalent policy in an appropriate Development Plan Document. Applicants will be required to comply with it when they submit proposals for development on the North Oxford Gravel terrace.

Effluent from wastewater treatment works (WWTW). Oxford Meadows SAC is located towards the north / upstream of the city. Sewage treatment will be dealt with at Sandford Sewage Treatment Works, which is located just outside Oxford on its southern boundary, downstream of the SAC.

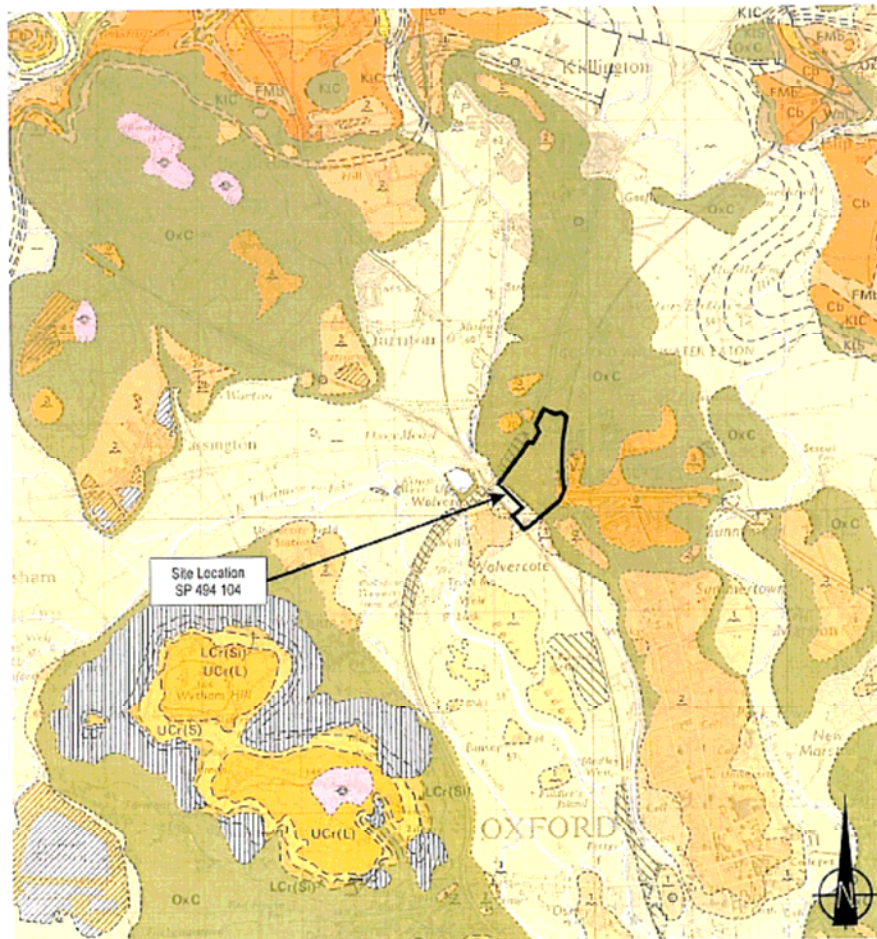
Oxford City Council is not proposing a level of development that exceeds the capacity of wastewater treatment works. Throughout the production of the Core Strategy, Thames Water have been consulted and have supported the proposed new housing both in Oxford and to the South of the City in the proposed Strategic Development Area. Thames Water has confirmed that there is sufficient treatment capacity at the Sandford Sewage Treatment Works to cater for the wastewater flows anticipated in the Oxford Core Strategy and South Oxfordshire Core Strategy, including the South of Oxford SDA. However, Thames Water's preference is for the Sewage Treatment Works to be relocated as part of the overall masterplan for the 4000 dwellings to the South of Grenoble Road¹⁶.

The Sustainability Appraisal and HRA/AA of the South East Plan identified seven locations where a limit should be placed on additional housing because of limits to wastewater treatment capacity; Oxford is not one of the identified locations.¹⁷

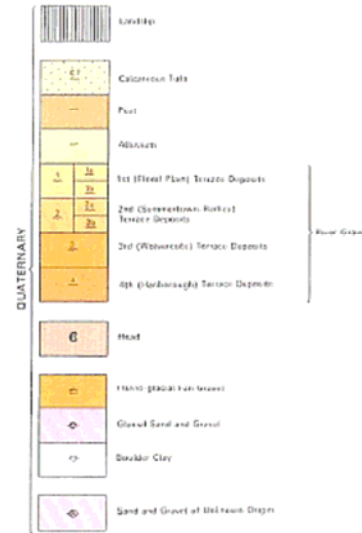
¹⁵ [Email from the Environment Agency dated 03/12/2008](#)

¹⁶ [Email from Thames Water dated 06/07/2009](#)

¹⁷ Scott Wilson and Levitt–Therivel, RSS for the South East: Sustainability Appraisal and Habitats Regulations Assessment/Appropriate Assessment of the Secretary of State's Final Revisions, (April 2009), p 179

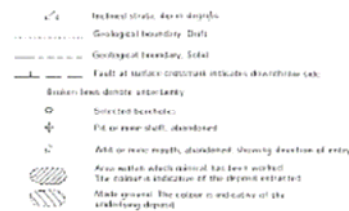


INDEX AND EXPLANATION OF DRIFT SYMBOLS AND COLOURS

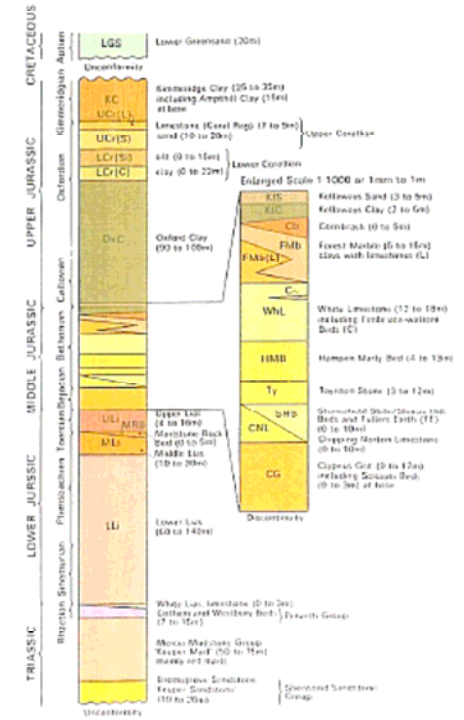


(For Solid symbols and colors see Generalized Vertical Section)

EXPLANATION OF GEOLOGICAL SYMBOLS



GENERALIZED VERTICAL SECTION AND KEY TO SOLID SYMBOLS AND COLOURS



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Figure 3.3: showing the geology of Oxford Meadows SAC and the surrounding area. The Peartree/Northern Gateway (and Green Belt land south of the A40) are outlined in black. Source: Peter Brett Associates, (2009) Peartree/ Northern Gateway Preliminary Hydrogeological Review

Oxford City Council also has an adopted SPD, which deals with a variety of issues, including water resources. The SPD currently requires all developments over a certain threshold size to undertake a Natural Resource Impact Analysis (NRIA). One of the objectives of the NRIA is to incorporate the minimisation of water resources and encourage the use of water saving devices in new developments. The requirement for developers to submit an NRIA will be incorporated in the Core Strategy.

Additional measures, such opportunities for reedbeds, sustainable drainage, etc., should be investigated later on in the planning process, (Natural England's Category B, for "down the line" assessments). The City Council will require details of appropriate sustainable urban systems in the production of the Northern Gateway AAP, and at the detailed mater-planning/ application stages to prevent any significant adverse effect on the Oxford Meadows SAC.

As such, water quality impacts as a result of the Oxford Core Strategy are unlikely to have a significant effect on the Oxford Meadows SAC.

Possible 'in combination' impacts

Nutrient enrichment could potentially occur as a result of the application of fertilizers upstream of Oxford Meadows SAC (outside the boundary of the City). Effluent discharges upstream from Oxford could also potentially affect water quality. However, the Environment Agency only gives consent to developments that will allow water quality standards to be met. The Environment Agency has recently increased the consented discharge at Sandford, to the South of Oxford, from 90,000 to 120,000 cubic metres a day.¹⁸ [With regard to sewage discharges, the Environment Agency has assessed all relevant discharges upstream of the Meadows and concluded "no adverse effect on the integrity of the SAC"¹⁹. From the point of view of major discharges from the built area in/near Oxford, the Environment Agency included the Cassington Sewage Treatment Works in their assessment.](#)

As such, development in Oxford will not have any 'in combination' water quality impact on the Oxford Meadows SAC.

¹⁸ Environment Agency (February 2008) CAMS update www.environment-agency.gov.uk

¹⁹ Email from Environment Agency dated 03/12/2008

3.3 Balanced Hydrological Regime

Baseline situation

Three main sources of water to the meads have been identified to support the plant communities on the Oxford Meadows SAC. These are direct rainfall, surface water, and groundwater flowing in from outside the area. Any one of these sources, or a combination, may contribute to the soil water, which supports the plant communities on the meads.²⁰

Oxford's water comes from Farmoor reservoir, which derives its water from the River Thames. The River Thames is maintained at prescribed levels by a series of weirs and locks. In the vicinity of Oxford Meadows, these are Kings, Godstow, and Osney locks. Apart from at times of drought, and flood, when the weir boards are lowered or raised, river levels are maintained at a remarkably constant level.²¹ Thames Water has an abstraction license for abstracting water at Farmoor reservoir, which is currently close to being fully utilised. The Environment Agency regulates (audits/ controls/ limits) Thames Water's abstraction license from Farmoor.

When the original draft of the HRA was written in 2007, the following statement was inserted as a precautionary measure, since there was uncertainty as to whether this was likely to happen. As the Oxford Meadows SAC forms part of the river Thames flood plain, there is the potential for water abstraction from the Thames to affect the hydrology of Oxford Meadows.

Since the above statement was originally drafted, Thames Water has published its Draft Water Resources Management Plan for the period 2010-2015. Table 30 in the management plan discusses the list of options for the SWOX (Swindon Oxford) area. That table is reproduced below at table 3.7 in the HRA.

The table shows the options that Thames Water is considering for increased water supply to the SWOX area. Notably absent are proposed increases to the abstraction licence at Farmoor, or other areas upstream of the SAC that would affect flow levels in the Thames.

The Environment Agency has undertaken a study on the Oxford Meadows SAC in relation to the abstraction licence that it allows from Farmoor Reservoir and their likely effects on the Oxford Meadows SAC. This study concluded that, at present, the licence at Farmoor does not impact on the SAC.

According to the Catchment Abstraction Management Strategy for the River Thames February 2008 update (produced by the Environment Agency), in February 2007, in consultation with Thames Water, the Environment Agency replaced several unused licences in rural Oxfordshire and Berkshire with an increase in a large licence at Gatehampton on the River Thames. The increase, from 25,620,000 to 31,279,770 cubic metres a year, made more water available to supply the Oxford area.

As originally drafted the HRA stated that: Thames Water has made provision to bring additional water supplies from another area – GATOX (Cleeve). The Cleeve source will provide Thames Water with an additional limited resource which Thames Water estimate will, under current planning horizons, provide water up to 2020. The Gatehampton and Cleeve licences are from further downstream of the SAC. As such they do not pose a risk to the site, however the supply that they provide means an increase in water available. It is worth noting that according to the Draft Water Resources Management Plan, this pipeline has been completed.

²⁰ [A. Dixon \(2005\) The Hydrology of Oxford Meadows](#)

²¹ [ibid](#)

Water Resource Options - SWOX			ADPW Yield (MI/d)	Date available	ADPW AISC (£/MI)
Scheme	Scheme Type	Name			
PR09 SWOX 01	Groundwater	Goring Gap 1 (licence transfer)	4.3	2011	137
PR09 SWOX 02	Groundwater	Goring Gap 3	10.0	2014	210
PR09 SWOX 03	Artificial Storage and Recovery	ASR - Cricklade - OPTION B	9.5	2016	306
PR09 SWOX 04	Groundwater	Lambourn Downs (pumps)	0.9	2012	322
PR09 SWOX 05	Artificial Storage and Recovery	ASR - Cricklade - OPTION A	9.5	2016	332
PR09 SWOX 06	Groundwater	Shalbourne (option B)	7.1	2013	293
PR09 SWOX 07	Groundwater	Goring Gap 2 (Increased licence & Network constraints)	6.1	2014	455
PR09 SWOX 08	Surface Water	Culham (resource only)	4.0	2013	461
PR09 SWOX 09	Groundwater	Goring Gap 4	15.0	2014	461
PR09 SWOX 10	River regulation and direct supply reservoir	Reservoir - Abingdon Phased (75Mm3 + 75Mm3) (P2S)	24.0	2024	550
PR09 SWOX 11	River regulation and direct supply reservoir	Reservoir - Abingdon 150Mm3 (3 zones SWOX)	48.0	2021	574
PR09 SWOX 12	River regulation and direct supply reservoir	Reservoir - Abingdon 150Mm3 (SWOX)	48.0	2021	649
PR09 SWOX 13	River regulation and direct supply reservoir	Reservoir - Abingdon 75Mm3 (SWOX)	24.0	2017	718
PR09 SWOX 14	River regulation and direct supply reservoir	Reservoir - Abingdon Phased (75Mm3 + 75Mm3) (P1S)	24.0	2021	823
PR09 SWOX 15	Direct Supply Reservoir	Reservoir – Longworth 30Mm3	69.0	2019	987
PR09 SWOX 16	Raw Water Transfer	Severn-Thames Transfer (SWOX)	48.0	2020	883
PR09 SWOX 17	Direct Supply Reservoir	Reservoir - Abingdon 30Mm3	69.0	2017	1006
PR09 SWOX 18	Canal Transfer	Oxford Canal Transfer (Grimsbury)	15.0	2014	947
PR09 SWOX 19	Direct Supply Reservoir	Reservoir – Marsh Gibbon 30Mm3	69.0	2019	1191
PR09 SWOX 20	Surface Water	Culham (+ treatment 4.5MI/d)	4.0	2014	1122
PR09 SWOX 21	Direct Supply Reservoir	Reservoir – Quanton 30Mm3	69.0	2019	1274
PR09 SWOX 22	Raw Water Transfer	Northern England Transfer (Cherwell) – SWOX	8.0	2018	1236

* Phase 2 of a two phase scheme, cannot be implemented before (PR09 SWOX 14)

Table 3.7 Water Resource Development Options – SWOX

Source: Thames Water Draft Water Resources Management Plan (May 2008)

The Environment Agency also increased the consented discharge at a sewage treatment works at Sandford, to the south of Oxford, from 90,000 to 120,000 cubic metres a day. The potential impact of the abstractions has therefore moved downstream from sensitive tributaries to the main river, where it has been further mitigated by returning the water upstream of the point of abstraction.²²

Possible impacts from the Oxford Core Strategy

Water resources: surface water and the Oxford Meadows SAC

According to the Audit Commission, annual water use per capita in Oxford is 59,860 litres. If the City Council follows the South East Plan Panel's recommendation for 8,000 dwellings to be built in Oxford over the next 20 years, plus an additional 4,000 dwellings are built in the proposed South Oxford Strategic Development Area, and there are 2.32 persons per household, giving a total population increase of 27,840, the total increase in water consumption would be 1,666,502,400 litres per year (4,565,760 litres a day). Since the HRA was originally published the South East Plan has been finalised, and the housing numbers above are those that the Oxford Core Strategy has planned for. In addition there is the extra water that will be used by non-residential development: ~~commercial, hospital etc~~ the main such growth will be in commercial 'B Class' uses, with a predicted increase of 7,150 – 9,650 jobs in this sector over the Core Strategy period. Using the minimum standard in relation to new office development in the City Council's Natural Resource Impact Analysis SPD (9,300 litres or 9.3 cubic metres per

²² Environment Agency, CAMS update February 2008

person per year), this would result in a total increase in water consumption of between 66,495,000 and 89,745,000 litres per year (between 182,178 litres and 245,876 litres a day).

However, while a significant volume of water, this still constitutes a small proportion of the total extracted from the Thames at Farmoor /Swinford. The ~~total water supply~~ annual licensed abstraction from these sites is ~~between 140 and 160~~ 151.54 million litres a day or ~~58,400~~ 55,312 million litres a year. Based on these figures the increase in the water consumption from Farmoor/Swinford arising from the implementation of the Core Strategy residential development would amount to ~~2.85%~~ 3.01%. The maximum increase arising from office and other B Class uses would be 0.16%. Thames Water has confirmed that the figures for volumes of water abstracted at Farmoor Reservoir are fairly accurate and consider them suitable for inclusion in the Appropriate Assessment of the Oxford Core Strategy. The Environment Agency's increase in the abstraction licence (at Gatehampton/ Cleeve – downstream of the Oxford Meadows SAC) is able to accommodate the estimated increase of 1,666,502.4 cubic metres anticipated by the Oxford Core Strategy.²³ The EA were contacted as to whether this increase would be able to accommodate development in the Oxford Core Strategy. The EA responded that it would be unlikely to have a significant impact on the Oxford Meadows SAC.

The risk of impact to the SAC was posed by the licence at Farmoor alone. According to the Environment Agency, the current maximum abstraction rate licensed at Farmoor is not having a significant impact. No further licences at Farmoor or new licences in the vicinity of the Oxford Meadows SAC will be granted unless it can be show that there is no risk to the SAC²⁴. As previously stated, Thames Water does not intend to increase the abstraction licence at Farmoor.

One of the measures proposed by Thames Water for dealing with water resources issues in the SWOX area, is the Upper Thames Major Resource Development, (UTMRD). The preferred location for the reservoir is in the Vale of White Horse. This reservoir is required for the future supply of water since Thames Water has identified that demand side measures (e.g., water efficiency measures) alone will not be sufficient to meet the future demand for water. The new reservoir was originally anticipated to be required in 2021, but this date has since been revised to 2026 due to the economic downturn and revisions to population forecasts. Thames Water will monitor the situation with regards to the need for additional supply on an annual basis.²⁵

Groundwater and the Oxford Meadows SAC

The previous section (3.2) on water quality also goes into detail about the balanced hydrological regime of groundwater flow at the Oxford Meadows SAC, but it is pertinent to re-iterate the key points here.

Groundwater recharge is a hydrologic process where water moves downward from surface water to groundwater. The Second Terrace Gravels on which Oxford is built appears to be a source of groundwater recharge²⁶. Maps from the British Geological Survey (see figure 3.3 above) indicate that almost the whole of the proposed development site at Peartree/ Northern Gateway is on top of Oxford Clay. Since the site is not on top of the Second Terrace Gravels, its development is not likely to have a significant impact on the Oxford Meadows SAC with regard to groundwater recharge.

²³ Environment Agency, CAMS update February 2008

²⁴ Email from Environment Agency dated 03/12/2008

²⁵ Email from Thames Water dated 06/07/09

²⁶ Eyles, A. R., (1986). An Investigation into the geology and groundwater of the Summertown-Radley river terrace, Oxford, Undergraduate thesis, Coventry (Lanchester) Polytechnic.

A desk review undertaken by Peter Brett Associates in 2009 confirmed that the site (of Peartree/ Northern Gateway) mainly overlies impermeable Oxford Clay, which is a non-aquifer. Groundwater flow is imperceptible with the Oxford Clay and is therefore unlikely to impact on the hydro-geological regime in the area.

Furthermore, the City Council has adopted a Natural Resource Impact Analysis Supplementary Planning Document (NRIA SPD). This requires new developments to look at the issue of minimising the use of water resources, and encourages new developments to look at measures such as water-saving devices; rainwater collection/harvesting and grey water recycling. The preferred target is to achieve a 30% reduction of average water use, though the minimum standard is simply not to exceed the *current average water consumption*. The Oxford 2026 Core Strategy Proposed Changes to the Submission Document also has a policy CS104 on Energy and Natural Resources. Developments on qualifying sites will be expected to demonstrate that they have minimised water consumption by incorporating appropriate design and technologies. Any targets will be set in an appropriate level Local Development Document.

Groundwater flow from the north Oxford Gravel terrace may have an important role in maintaining water levels in the Wolvercote Common/Port Meadow area of the Oxford Meadows SAC. It is important, therefore, that new development in north Oxford, including Peartree/Northern Gateway, includes provision for sustainable drainage so that rainwater is able to continue to percolate into the ground, in order to avoid diminishing this water resource.

A full explanation with regard to the strategic sites of Summertown, and Peartree/ Northern Gateway in relation to groundwater flow has occurred at section 3.2. It is worth noting that the Green Belt land to the south of the A40 lies partially on the Alluvium and terrace deposits that form the base geology for the Oxford Meadows SAC. Given the proximity of this area of Green Belt land to the Oxford Meadows SAC, a full hydrological assessment should be undertaken should this parcel of land be brought forward for development as the result of a Green Belt review. Such an assessment is required to ascertain that the integrity of the Oxford Meadows is not threatened should this parcel of land be brought forward for development.

The city council has an adopted Local Plan policy, NE.10 relating to this issue, which states that:

Planning permission will only be granted for developments that would not significantly increase surface water run-off. Wherever practicable, this will be through the use of sustainable drainage systems. The city council will require developers to demonstrate that they have made appropriate provision for surface water drainage and that this would effectively mitigate any potential adverse impact from surface water run-off.

Policy NE.10 in the Adopted Local Plan is to be superseded by Policy CS12 in the Core Strategy. In relation to Sustainable Drainage systems, Policy CS12 states:

Unless it is shown not to be feasible, all developments will be expected to incorporate sustainable drainage systems or techniques to limit run-off from new development, and preferably reduce the existing rate of run-off.

Policy CS6 on the Northern Gateway in the Proposed Changes to the Submission Core Strategy (April 2009) also expressly requires that “development proposals will be expected to incorporate sustainable drainage systems or techniques”.

This is supported by Planning Policy Statement (PPS) 25 on Development and Flood Risk, which states in paragraph F6 that surface water arising from a developed site should, as far as practicable, be managed in a sustainable manner to mimic the surface water flows arising from

the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account.

Given these mitigation measures, the impact of the Oxford Core Strategy is therefore unlikely to have a significant effect on the balanced hydrological regime of the Oxford Meadows SAC.

Possible 'in combination' impacts

Development in Oxfordshire and Swindon uses water from the River Thames catchment upstream of Oxford Meadows. This could affect the hydrology of the Oxford meadows SAC as it is likely to lead to increased abstraction from the Thames. Residential development in Oxford alone over the Core strategy period is likely to increase the water supply needed from Farmoor/Swinford by 2.85%. With significant development proposed at Swindon and Bicester, both of which currently derive much of their water supply from Farmoor/Swinford the total increase in water supply from this source could be significant, which would increase the amount of water being extracted from the Thames. Development of a proposed eco-town of ~~10,000–15,000 homes at Weston Otmoor~~, [of approximately 5,000 homes north west of Bicester](#), and 1,000 homes at Upper Heyford (Cherwell District Council) could also increase water abstraction.

This is likely to be mitigated by the new pipeline that Thames Water are constructing from Goring to Fyfield ([N.B., this has now been completed](#)), which will enable more of Swindon's water supply to be derived from the borehole at Cleeve. Adverse impacts would be most likely to arise in drought conditions, when a drought permit may be issued allowing additional abstraction from the Thames. This happened, for example, in November 2003 when abstraction of up to 90,000m³day⁻¹ (rather than 59,100 m³day⁻¹) was permitted when flow was less than 136,380 m³day⁻¹. However, water levels in the Thames have not dropped enough to affect the meadows since the drought of 1976. The low flow conditions of 2003 did not approach the severity of 1976. The probability of a repeat of 1976 conditions is dependent on water demand and future drought patterns.²⁷

[As previously stated, Thames Water does not consider further abstraction from the Thames at Farmoor as one of their future development options for the supply of water to the SWOX area. The preferred location for the development of a new reservoir is downstream of the Oxford Meadows SAC in the Vale of White Horse. Any future abstraction from such a development could not have an impact on the hydrology of the Oxford Meadows since any abstraction that would occur would be downstream of the SAC.](#)

[The Environment Agency have also confirmed that no further abstraction licence will be granted at Farmoor unless it can be shown that there will be no significant adverse effects on the Oxford Meadows SAC. Since Thames Water does not include options for further abstraction at Farmoor in any of its Asset Management Plans, it is not an option that needs further consideration.](#)

The Panel report for the Draft South East Plan states that "...with [an] 8% energy saving (which should be achievable following current strengthening of the Building Regulations) and continued development of water supply resources by the water companies shows that with the draft Plan housing levels, all water resources zones except Milton Keynes will experience an approximate supply-demand balance or small surplus at 2016 and 2026."²⁸ [The Sustainability Appraisal of](#)

²⁷ David M Cooper 'Water Levels in three monitoring transects across Yarnton and Pixey Meads, Oxford, during 2004: Inferences on the effect of abstraction from the Thames at Farmoor Reservoir' CEH Wallingford, October 2005 pages ii & 8.

²⁸ The South East Plan Examination-n-Public November 2006-March 2007, Report of the Panel: Volume 1, (August 2007), para 10.8

[the South East Plan did not identify Oxford as one of the locations where water resource constraints were particularly problematic.](#)²⁹

Gravel extraction to meet the increased primary aggregate targets (South East Plan Policy M3) could affect the hydrology of the site. The SA of the draft South East Plan states in paragraph 12.3.2 that ‘expansion of quarrying within the catchment of the Oxford Meadows SAC may lead to problems of maintaining groundwater levels in part of the site.’ While development in Oxford will require the use of additional aggregates, these are serving a nationwide catchment and even if the amount of development in the Core Strategy was reduced this would not have a direct effect on gravel extraction in the vicinity of the Oxford Meadows SAC. While therefore it is important to reduce the use of aggregates and to maximise re-use and recycling, this would be unlikely to reduce the need for gravel extraction in the vicinity of the Oxford Meadows.

[Oxfordshire County Council's Minerals and Waste Development Framework is still at a relatively early stage, and it is therefore not possible for any in-combination impacts arising from future minerals extraction to be assessed at the current time. The City Council will work with the County Council to help assess any in-combination impacts on the Oxford Meadows SAC when the first set of Minerals and Waste Development Documents reach a more advanced stage.](#)

The Environment Agency’s flood alleviation scheme for Oxford, which is likely to consist of enlargement of existing watercourses and/or creating flood relief channels, may affect the flooding regime of the River Thames. Natural England has stipulated that a key requirement of the Oxford flood relief scheme is that it does not have an adverse impact on the Oxford Meadows hydrological regime.

[A consultation document in relation to the draft Flood Relief Management Strategy was published in February 2009. The draft Strategy proposes a new watercourse in West Oxford. The consultation document states “details are currently being drawn up for a new channel that will link parts of the existing river system between Botley and Sandford”](#)³⁰. [The SEA for the Oxford Flood Relief Management Strategy stated that: based on existing information, a series of model assumptions, and objective analysis it has been possible to conclude that the implementation of temporary flood storage under a climate change scenario is unlikely to have a significant impact on the Oxford Meadows SAC](#)³¹

The Environment Agency was contacted with regard to the potential ‘in-combination’ impacts of other plans and projects on the Oxford Meadows SAC. The Environment Agency conducted an HRA for the abstraction license at Farmoor – the only abstraction likely to have an impact on Oxford Meadows SAC. The EA stated that ~~because of the way that water in the River Thames is controlled – through weirs and locks, flows could be maintained along the river. Because flow is controlled in this manner, the EA stated that ‘in-combination’ impacts of other plans and programmes, would be unlikely to have a significant effect on the Oxford Meadows SAC.~~ [Farmoor has the potential to reduce flows \(volume of water moving down the river\). However, because of the locks and weirs, levels can be controlled and are largely maintained at a standard head in everything but the severest droughts. The head at Kings Lock has only really significantly dropped once since monitoring began – and that was in 1976 and was only for a very short period. It is the level that is important for supporting the vegetation on the meadows, as it is the level that helps feed the gravels under them and therefore sustains the vegetation. Because of this the risks posed by the current licence are insignificant](#)³²

²⁹ Scott Wilson and Levitt–Therivel, RSS for the South East: Sustainability Appraisal and Habitats Regulations Assessment/Appropriate Assessment of the Secretary of State’s Final Revisions, (April 2009), p 198

³⁰ [Environment Agency, Consultation for the Oxford Flood Risk Management Strategy, Spring 2009](#)

³¹ [SEA Report for the Oxford Flood Risk Management Strategy, February 2009](#)

³² Email from the Environment Agency dated 03/12/2008

The Environment Agency assessed the “in-combination” impacts of other plans and programs when looking at abstraction impacts and concluded that there would be no adverse effect.

Given the above, it is unlikely that there will be any ‘in-combination’ impacts with regard to the hydrology of the Oxford Meadows SAC.

3.4 Recreational pressure

Baseline situation

Extensive public use is already made of the Oxford Meadows SAC for informal recreation without an adverse impact on *Apium repens*, the species for which it has been designated a SAC. This species is not particularly sensitive to trampling and also thrives in the wettest areas, where there is least recreational pressure for most of the year. The remaining areas of the SAC are further away and have very limited or no public access, with no ready access from Oxford as they are on the north side of the Thames towpath.

Possible impacts of the Core Strategy

Public consultation carried out by Scott Wilson as part of their 'Oxford City Green Space Study' revealed that people are willing to walk approximately 1,900 metres to important green spaces such as Oxford Meadows SAC, which includes [Port Meadow](#) ~~the Oxford Meadows SAC~~. 1,900 metres from Oxford Meadows SAC covers all of north and west Oxford, including the proposed strategic development sites at Peartree/Northern Gateway, the West End and the land at Summertown. Peartree is being considered for employment-led uses. As such it should not significantly affect recreational use of Oxford Meadows SAC. Land at Summertown is identified as a suitable site to meet longer-term residential development needs. It may not necessarily come forward for development within the period covered by the Core Strategy. The railway line, canal and St Edward's School sports ground create significant severance from Oxford Meadows SAC. Regular use from residents of Summertown is therefore unlikely. In any event, new public open space created as part of any future development in Summertown would be likely to ease potential recreational pressure from Summertown on Oxford Meadows SAC.

The other main area of new housing within 1,900 metres of Oxford Meadows SAC will be in the West End. The West End is only 800 metres from the southern end of Oxford Meadows SAC. It is likely that some people will use this area of the SAC for recreational purposes. However, a key aim of the West End development is to improve the public realm and green spaces in the area, offering enhanced recreational opportunities. The creation of a linear park along Castle Mill Stream, improvements to Oxpens Field and to the path along the Thames are all being made to the West End of Oxford in order to improve the environment (in all senses of the word) of the area. Amenity space and play areas to serve the new residential development will also be required. It is expected therefore that many recreational needs will be met within the West End, which will reduce the pressure on Oxford Meadows SAC. There are also already extensive alternative areas of green space that residents of the West End would be able to use including Grandpont Nature Park, Christchurch Meadows and the University Parks.

An important aim of the Core Strategy is to ensure that adequate green space is provided as part of new developments. To this end the Core Strategy will use the citywide target of 5.75 ha of green space per 1,000 population as recommended by the Oxford Green Space study (Scott Wilson). The Core Strategy ~~is~~ is ~~will be~~ worded to ensure that larger developments provide appropriate on-site green space. Contributions will continue to be taken to improve the quality of existing open space. Opportunities will also be sought to open up new areas of green space to the general public. It is expected therefore that many of the recreational needs of new residents will be met by new green space provision as well as by the extensive areas of existing green spaces. The new green areas could also draw existing users away from the SAC, which would help to reduce recreational pressure.

Recreational Pressure as a result of the Oxford Core Strategy is therefore unlikely to have a significant effect on the Oxford Meadows SAC. This has therefore been screened out at this stage of the assessment.

Possible 'in combination' impacts

There has been extensive development in the Oxford canal corridor over recent years, but this is now largely complete. Few other sites have been allocated for residential development within 1900m of the Oxford Meadows SAC in the 'Oxford Local Plan 2001-2016'. One such site is the Wolvercote Paper Mill, allocated for a mix of employment and employment generating uses. In north Oxford there are few other opportunities for residential development, other than infilling and potential redevelopment of existing properties. This is mainly due to the extensive area of the Oxford flood plain. Access to the Oxford Meadows SAC from the existing residential areas in north Oxford is limited by the severance created by the main Oxford to Birmingham railway line.

The proposed area of search for the South Oxford Strategic Development Area is over 6.5km away at the southern edge of Oxford, and recreational pressures from that development are likely to be very limited given that residents could much more easily access the countryside and rights of way to the south of the city.

The area adjacent to Oxford Meadows outside of Oxford is Green Belt and flood plain so is unlikely to be developed. The only housing development is likely to take place in Botley. The Vale of White Horse Core Strategy Preferred Options document indicates that there is likely to be in the order of 750 homes built in Botley between 2006 and 2027, which includes three sites already allocated for housing in their adopted Local Plan³³. These sites are between 1.7km and 3 km from the nearest part of the Oxford Meadows SAC, and are separated from it by the A34, therefore they are unlikely to generate significant additional recreational pressures.

A potentially large mixed-use housing and employment site of 142 ha has been suggested for consideration by Cherwell District Council at Yarnton to the north of the SAC³⁴. However, given the Green Belt designation that applies to this site, it seems extremely unlikely that it will be taken forward in Cherwell's emerging Local Development Framework.

~~The recently adopted West End Area Action Plan proposes 800 new homes as well as 2ha of employment land. The West End of the city is within 1900m of the Oxford Meadows SAC. However, there are already a number of accessible green spaces within Oxford, including University Parks and Christchurch Meadows. Access to the Oxford Meadows SAC is not easy. As such 'in combination' impacts are thus unlikely.~~

³³ Vale of White Horse District Council, Core Strategy Preferred Options, (January 2009), p 56

³⁴ Cherwell District Council, Supplemental Consultation on Site Allocation Issues and Options, (February 2008), pp 82-83

Table 3.8 showing a summary of all impacts including 'in-combination' effects

Site	Qualifying Features	Key environmental conditions to support site integrity*	Possible impacts arising from plan	Is there a risk of significant effect	Possible impacts from other trends, plans, etc.,	Is there a risk of significant 'in-combination' effects?
Oxford Meadows SAC	Lowland hay meadows in the Thames Valley centre of distribution. Site includes vegetation communities that are perhaps unique in the world in reflecting influence of long-term grazing and hay-cutting on lowland hay meadows. Site benefited from survival of traditional management, which has been undertaken for several centuries. Site exhibits good conservation of structure and function.	Minimal air pollution - NOx may cause reduction in diversity	Development of 8,000 new houses and 4,500 new jobs as a result of the Core Strategy, particularly with the allocation of a strategic employment site (Peartree) could result in an increase in air pollution	No	Development of 55,200 new homes in Oxfordshire, as proposed in policy H1 of the draft South East Plan, and 80,000 new homes and 2 million square metres of new business floorspace in South Hampshire, as proposed in policy H1 and SH3 of the Proposed Modifications to the South East Plan could increase pressure to use the A34.	Unlikely to be significant in the Core Strategy period due to tightening of European emissions standards for cars/ lorries and cleaner energy generation. Point source data from the Highways Agency indicates that a very small transect (within 15m of the A34) is outside the critical range for NOx. However, given further tightening of EU vehicle emissions standards, this is likely to fall throughout the Core Strategy period.
	Oxford Meadows is selected because Oxford Meadows SAC is the larger of only two known sites in the UK for creeping marshwort <i>Apium repens</i> .	Absence of nutrient enrichment of waters; good water quality/ Flood waters that are not from a eutrophic source.	The strategic location for Peartree/ Northern Gateway is located predominantly on the Oxford Clay. This is an impermeable non-aquifer. As such groundwater does not flow from this site to the Oxford Meadows SAC. At the proposed strategic location of Summertown, groundwater flow is in the opposite direction to the Oxford Meadows SAC. As such water pollution impacts as a result of development of this site are insignificant.	As most of the North Oxford gravel terrace is already developed the impact on nutrient enrichment and water quality would be unlikely to be significant. Since no water flows from either of the proposed development sites to the Oxford Meadows SAC, water pollution impacts are not significant. Discussions with the EA confirmed that development at Peartree/ Northern Gateway unlikely to have significant impact on Oxford Meadows SAC.	Nutrient enrichment could potentially occur as a result of the application of fertilizers upstream of Oxford Meadows (outside the city boundary). This will not be affected by spatial planning policy. It could also arise from effluent discharges upstream of Oxford. Any impact from development upstream would need to be considered by the relevant Appropriate Assessment.	Little or no impact

	Balanced hydrological regime – alteration to adjacent rivers may alter flooding regime and reduce botanical diversity.	Closest development is Peartree/ Northern Gateway. Given the size and scale of this development (and the fact that the site is predominantly located on impermeable Oxford Clay) it is unlikely that significant effects on groundwater flow that would affect the hydrology of the Oxford Meadows SAC would take place.	No	Development in Oxfordshire and Swindon uses water from the River Thames could affect the hydrology of the Oxford Meadows SAC. Thames Water Draft Water Resources Management Plan does not include options for increasing the abstraction license at Farmoor/ Swinford. Other supply-side measures are proposed for the supply of water the SWOX area including the development of the Upper Thames Reservoir.	Unlikely to be significant as EA has investigated abstraction license at Farmoor and will not increase it unless it can be shown that no significant effect on the Oxford Meadows SAC will result.
	Recreational pressures	Few opportunities for residential development in North Oxford so unlikely to increase recreational pressure.	No	Unlikely	The area close to Oxford Meadows outside of Oxford is Green Belt and flood plain so is unlikely to be developed.

*Identified at an appropriate assessment screening workshop carried out for the South East Plan

Conclusions

The Oxford Meadows SAC is currently judged by Natural England to be in a favourable condition. This Habitats Regulations Assessment has concluded that none of the policies in the Oxford 2026 Core Strategy Proposed Submission Document are likely to have significant effects on the Oxford Meadows SAC with regard to the following environmental requirements of the site:

- Maintenance of traditional hay cut and light aftermath grazing
- Absence of direct fertilisation
- Minimal Air Pollution
- Absence of nutrient enrichment of waters; good water quality
- Balanced Hydrological Regime
- Recreational pressures