URS

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Oxfordshire Minerals and Waste Core Strategy

Sustainability Appraisal/Strategic Environmental Assessment

Minerals Preferred Strategy
August 2011

Revision Schedule

Draft Preferred Minerals Core Strategy SA/SEA
August 2011

Rev	Date	Details	Prepared by	Reviewed by	Approved by
01	August 2011	Draft	Anita Longworth Principal Planner	J.Boca/ Colin Bush Environmental Consultants	Colin Bush
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Executive Summary

Oxfordshire County Council is preparing a Minerals Core Strategy (MCS) as part of its Minerals and Waste Development Framework (MWDF). The MCS will set out the Council's approach to Minerals planning and will replace the adopted Minerals Local Plan. As part of the plan preparation process, the MCS is required to be subject to Strategic Environmental Assessment (SEA) and Sustainability Appraisal (SA).

SEA involves the systematic identification and evaluation of the environmental impacts of plans and programmes and stems from the EU SEA Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment. SA broadens the concept of SEA to encompass economic and social impacts and is required under the Planning and Compulsory Purchase Act 2004. Government guidance requires that all Development Plan Documents (DPDs) are subject to both SEA and SA.

Throughout this report, where reference is made to Sustainability Appraisal, it should be taken to include the requirements of the SEA Directive.

This SA report relates to the Preferred Strategy MCS and has involved the appraisal of the emerging MCS vision, objectives and policies against the SA objectives in order to assess their potential sustainability impacts.

The proposed **vision** addresses all of the sustainability objectives with the exception of climate change and adaptation (Objective 6). Additional text to address this objective should be considered. The proposed vision as worded would generate positive or very positive impacts in relation to all of the identified sustainability objectives, with the exception of Objective 6 (as noted above).

Strategic Policies

Policy M1 and M2 seek to make a sustainable contribution to Oxfordshire's sub-regional minerals apportionment based on a local assessment of supply (Atkins, January 2011). The target for recycled and secondary aggregates is recognised as ambitious as rates of utilisation are already high and secondary and recycled aggregates are not currently substituted for primary aggregates in structural uses, only in lower specification construction uses like car parks. However the target is consistent with the South East Plan (Policy M2 – 0.9 million tonnes per year).

The adverse effects which might arise from a particular volume of mineral working in the County are difficult to predict based on the apportionment figure alone, as it is the spatial implications, i.e. the location and distribution of mineral working sites which make up the apportionment which will determine the effects.

For this reason, the nature of any adverse impacts of Policy M1 and M2 will depend to some extent on the location of sites allocated through the Sites Allocations DPD and the application of the Common Core Policies to any individual applications, including the proximity of such facilities in relation to sensitive receptors.

However it can be expected that the adverse environmental and social effects of the proposed apportionment levels in Policy M2 might be less adverse than those experienced under the delivery of the current policy - Policy M3 of the South East Plan, which requires a higher level of provision or the Secretary of State's proposed changes to Policy M3, which would require an even higher level of supply.

Restoration schemes for those secondary/recycling sites which are no longer required will be required to address biodiversity, landscape, water and soil restoration objectives. A cross reference to Policy M6: Restoration of Mineral Workings in the supporting text to this policy is therefore recommended.

Policy M3 sets out the spatial strategy for mineral working. It is recognised that whilst concentrating extraction predominantly in areas where working is currently taking place or has taken place recently has economic advantages and presents opportunities for co-ordinated large-scale restoration projects which would in the longer term lead to beneficial effects for local communities, landscapes and wildlife; the long-term nature of mineral works means that communities and environments within/close to the identified areas will continue to experience the cumulative adverse effects of mineral working for the foreseeable future. Measures to mitigate against negative effects should be required at site selection and planning application stages.

Appropriately, the policy will not lead to an *overall* increase of working activity in West Oxfordshire, or in any one particular area, and so no significant additional adverse cumulative effects are expected on top of those already experienced, which is particularly important in areas where there has already been extensive working.

It should also be noted that mineral working and after-use in the flood plain can offer opportunities to increase flood water storage capacity and reduce the risk of flooding elsewhere, which will be important in the longer term, given the predicted effects of climate change. The sustainability of Policy M6: Restoration of mineral workings could be improved in relation to SA Objective 6 by reference to this opportunity.

Common Core Policies

All of the Common Core Policies (C1 – C8) were found to be broadly in line with the SA objectives.

The sustainability of Policy C1: Flooding in relation to SA objective 6 could be improved by reference to the future predicted impacts of climate change and the incorporation of adaptation measures to account for this, including any likely increased flood risk.

The sustainability of Policy C2: Water Environment in relation to SA Objective 8 could be improved by explicitly referring to the recreational values of maintaining water quality/quantity, as the River Thames for example, is a very important recreational resource for the county.

Policy C3: Environmental and Amenity Protection could be more explicit in defining what constitutes the 'environment' or a 'sensitive receptor' in order to give more guidance to developers. It would also be helpful to provide some guidance as to what might constitute an "unacceptable adverse impact". In addition, the potential impacts on human health, not just residential amenity should be considered (to comply with the SEA Directive requirements to consider effects on human health as captured by SA objective 8), and it might also be appropriate to consider local businesses as sensitive receptors, particularly where such businesses are dependent on a high quality environment and good amenity (e.g. tourism sector).

A cross reference in the supporting text to the Common Core Policies which deal with distinct elements of the 'environment' would be helpful in relation to Policy C3: Environmental and Amenity Protection – for example to highlight linkages to Policy C2 for ground and surface water, Policy C4 for Biodiversity and Geodiversity, Policy C5 for Landscape and Policy C6 for the Historic Environment and Archaeology.

Public access to restored mineral workings should be carefully managed however, so as to not adversely impact on habitats and species resident in the restored area. A reference to this effect should be included in the supporting text to Policy C8: Rights of Way to improve sustainability in relation to SA objective 1.

1 Introduction

1.1 The Oxfordshire Minerals Core Strategy

The Oxfordshire Minerals Core Strategy (MCS) is part of the Council's Minerals and Waste Development Framework (MWDF). The MWDF will set the overall framework for minerals and waste planning for Oxfordshire and will consist of a series of documents including Development Plan Documents (DPDs) which will contain minerals and waste core strategies, site allocations and policies. The MCS DPD will set out Oxfordshire County Council's approach to minerals planning until at least 2030 and will replace the adopted Minerals Local Plan. The table below shows the Council's proposed timetable for the preparation of the MCS. Further details can be found on the Council's website: www.oxfordshire.gov.uk.

Table 1.1 MWDF Timetable

Minerals Core Strategy DPD timetable
Regulation 27 (proposed submission) – 2012 Regulation 30 (submission) – 2012 Pre examination – 2012 Examination in Public – 2012 Adoption – 2013

1.2 Sustainability Appraisal

DPDs are required to be subjected to the formal process of Sustainability Appraisal (SA). The purpose of SA is to ensure that social, environmental and economic considerations are made during the preparation of policies and plans. By taking account of these factors during the preparation of the MCS DPD the aim is that the resulting planning decisions which emerge following the implementation of the DPD policies will be in keeping with the principles of sustainable development.

SA is a five-stage process as outlined below:

- Stage A – Setting the context, establishing the baseline and defining SA Objectives (Scoping).
- Stage B – Predicting and assessing the effects of the implementation of the DPD.
- Stage C – Documenting the findings of the Appraisal in the SA report.
- Stage D – Consulting on the DPD and SA report.
- Stage E – Monitoring the implementation of the DPD.

Stage A involves gathering the evidence base and defining SA Objectives. The findings of this stage are documented in a Scoping report. A Scoping report for the Oxfordshire MWDF was prepared in August 2005 and was updated in July 2009 and May 2011. It can be found on the Council's website www.oxfordshire.gov.uk.

The appraisal is conducted at Stage B and outcomes recorded in the SA report during Stage C. Following statutory consultation (Stage D) the SA report may require updating to reflect changes made in response to representations. Stage E concerns the ongoing monitoring of significant effects of the implementation of the DPD.

1.3 Compliance with SEA Directive

The SEA Directive sets out a legal assessment process that must be followed. This report clearly sets out the relevant requirements of the SEA Directive and the table below provides an indication of where the information required for inclusion in the 'Environmental Report' (SA Report) can be found.

Table 1.2 Compliance with SEA Directive

Environmental Report requirements[1]	Where covered
An outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes;	Scoping Report (2011) and Chapter 2 of this Report
The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;	Scoping Report (2011)
The environmental characteristics of areas likely to be significantly affected;	Scoping Report (2011) and Chapter 4 of this Report
Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;	Scoping Report (2011) and Chapter 2 of this Report
The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation;	Scoping Report (2011), Appendix 2
The likely significant effects[2] on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors;	Chapter 4 and Appendix A of this Report
The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme;	Chapter 4 and Appendix A of this Report.
An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;	Interim SA Reports – Draft Spatial Options (February 2010), Revised Spatial Options (September 2010) and Aggregates Apportionment Options (July 2011) and Chapter 3 and 4 of this Report.
A description of the measures envisaged concerning	Chapter 5 of this Report

[1] As listed in Annex I of the SEA Directive (Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment).
[2] These effects should include secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative effects.

monitoring in accordance with Article 10.	
A non-technical summary	See separate NTS.

1.4 This Report

This report is the SA Report of the **draft** Preferred Strategy MCS. It should be read in conjunction with the MWDF Scoping Report (May 2011) as the Scoping Report sets the context within which the appraisal has been undertaken. Other related documents include the Interim SA Reports for Minerals Draft Spatial Strategy Options (February 2010), Revised Strategy Options (September 2010) and Aggregates Apportionment Options (July 2011) which are available from the Council.

2 Sustainability Context, Baseline and Objectives

2.1 Introduction

This chapter, in compliance with the SEA Directive, sets the context of the appraisal and provides the details of the current state of the environment as identified in the Oxfordshire MWDF Scoping Report[3]. It also identifies the key issues and problems that the MCS and SA should respond to as well as the SA objectives that are used to appraise the draft Preferred MCS.

2.2 Policy Context

The SEA Directive requires the Environmental Report (SA Report) to provide information on the relationship of the DPD with other relevant plans and programmes. During the Scoping stage, policies, plans and programmes that were considered to influence or affect the Oxfordshire MWDF were reviewed. The purpose of this review was to identify the implications of the objectives of these policies, plans and programmes on the MWDF as well as implications for the SA.

The full list of the Plans and Programmes reviewed during the Scoping Stage can be found in Appendix 1 of the Scoping Report.

A number of key messages that should be taken into account in developing the Oxfordshire MWDF have been identified following the context review. Those relevant to the MCS are listed below. These messages are intended as guidance for the MCS and the SA to inform the decision making process. The list of messages in not necessarily exhaustive and no priority should be inferred from the ordering:

- The need to ensure that average distances travelled and traffic congestion are not exacerbated by minerals and waste HGVs, and that these vehicles do not worsen air quality in identified AQMAs, or reduce quality of life for local residents.
- Avoid damage to, and where possible proactively contribute towards the protection and enhancement of international, national, regionally and locally designated conservation sites, including SACs, SSSIs, NNRs, Local Wildlife Sites as well as BAP Priority Species and Habitats and nationally and regionally important geological features.
- The need to proactively plan for post mineral restoration and for after use of temporary waste sites, to protect, maintain, enhance or restore biodiversity.
- The need to protect the functional floodplain from mineral working and to take into account the hydrological implications of proposed mineral and waste developments, including assessing flood risk, effects of abstraction or de-watering, potential pollution, and groundwater changes before identifying sites for minerals and waste development.
- The need to protect and conserve all aspects of the historic environment and particularly internationally and nationally important historic features.
- The need to ensure a steady supply of mineral materials for local markets, to meet the demand generated by planned and existing development

[3] Oxfordshire MWDF Scoping Report, Revised May 2011.

identified in each of the four District Council's plans, and the City Council's plans, and for markets identified outside the county.

- The need to maintain a land bank of permitted reserves for aggregate minerals in line with national and regional guidance.
- Waste management policies should support sustainable waste management measures to encourage a reduction in the amount of waste arisings going to landfill in Oxfordshire. The need to provide waste management facilities to allow the county to be self-sufficient in its treatment and/or disposal of its waste arisings, and to dispose of its apportionment of London's waste arisings over the plan period.
- Minerals and Waste policies should enable minerals extraction and secure the recovery of waste without endangering human health or residential amenity in local communities.

2.3 Baseline Review

2.3.1 Introduction

The collection of baseline information is a key component of the SA process and a legal requirement under the SEA Directive.

Baseline information helps to provide a basis for predicting and monitoring effects and to identify sustainability issues for the SA to consider. When collecting baseline data, the aim is to assemble sufficient data on the current and likely future state of the area to enable the DPDs' effects to be adequately predicted. The sections that follow present a summary of key baseline data. More detailed information on the baseline conditions can be found in the MWDF Scoping Report (May 2011).

2.3.2 Demographic Profile

Oxfordshire has a population of around 635,500[4] and is predominantly a rural county; it is the least densely populated county in the South East of England.

Despite this, Oxfordshire has seen a strong rate of population growth in recent years (10.7% between 1995 and 2005) and significant growth in older age ranges (in the same period, the number of residents aged between 75 and 84 increased by 11.4%, and aged between 85 and 89 by 35.5%).

The population is expected to increase by 11.4% between 2006 and 2026, above the expected average growth for both England (10.1%) and the South East (10.1%) with growth expected in urban areas such as Oxford, Didcot, Bicester, Wantage, Grove and Witney. Oxfordshire receives a significant number of economic migrants. Oxford City has the second highest proportion of people born outside the UK in the South East and a total of 7,645 people from countries that joined the European Union in 2004 (accession countries) registered for work in Oxfordshire between May 2004 and March 2007 (10% of the total for the South East region). The proportion of non-white people in Oxfordshire is broadly equal with the rest of the South East (4.9%). Overall life expectancy is similar to the national average, although there are variations between Districts. Overall deprivation is low, although there are some more highly deprived areas, such as some wards within Oxford city and in Banbury.

[4] 2007 Mid-year population estimates published by ONS, August 2008, http://www.statistics.gov.uk/popest

2.3.3 Environmental Profile

Oxfordshire has a high environmental quality and environmental assets including areas of national importance designated for nature and landscape conservation. These include many European, nationally and locally designated sites as follows: 6 Special Areas of Conservation, 112 Sites of Special Scientific Interest (SSSIs), 4 National Nature Reserves, 17 Local Nature Reserves, 343 County Wildlife sites and 106 proposed sites.

The county is home to 67 of the UK BAP priority species and examples of 16 of the priority habitats identified in the UK BAP as being of international or national importance for biodiversity can be found in Oxfordshire. The Biodiversity Action Plan for Oxfordshire[5] currently contains Action Plans for 18 habitats and 21 species, including for lowland calcareous grassland, acid lowland meadow and reedbeds, which are the habitats most likely to be created through mineral restoration. Thirty six Conservation Target Areas have been identified in the county. The aim of these areas is to ensure that existing habitats are protected and maintained in good condition and at the same time expansion of areas of biodiversity value and linkage between these areas is encouraged, to provide more viable and sustainable biodiversity management units.

78% of the land in the county is under agricultural management (260,800ha). Important landscapes include the Chiltern Beechwoods, the limestone grasslands of the Cotswolds and the lowland meadows of the Thames valley. Three designated Areas of Outstanding Natural Beauty (AONB) together cover 24% of Oxfordshire and cover parts of the Chilterns, the Cotswolds and the North Wessex Downs. Much of the central part of the county around Oxford is designated as Green Belt.

Oxfordshire has nearly 13,000 Listed Buildings and structures, 2 registered battlefields, 55 Registered Parks and Gardens and 242 Conservation Areas. Blenheim Palace and Park is designated as a world heritage site, which reflects its outstanding international importance. Many of the Conservation Areas are villages which lie in close proximity to existing or planned mineral working. Eynsham, Ducklington, Nuneham Courtenay, Hatford and Shellingford are in existing working areas and Dorchester, Bampton, Benson and Stanton Harcourt & Sutton are in proposed new working areas.

There are approximately 350 Scheduled Ancient Monuments and many scheduled and non-scheduled archaeological sites along the Thames valley. Some areas have experienced mineral working in the past which has had significant effects on archaeological sites, particularly the Lower Windrush Valley, the Lower Evenlode valley and in the Radley area.

[5] Further details can be found on the ONCF website http://www.oncf.org.uk/biodiversity/biod_oxonbap.htm

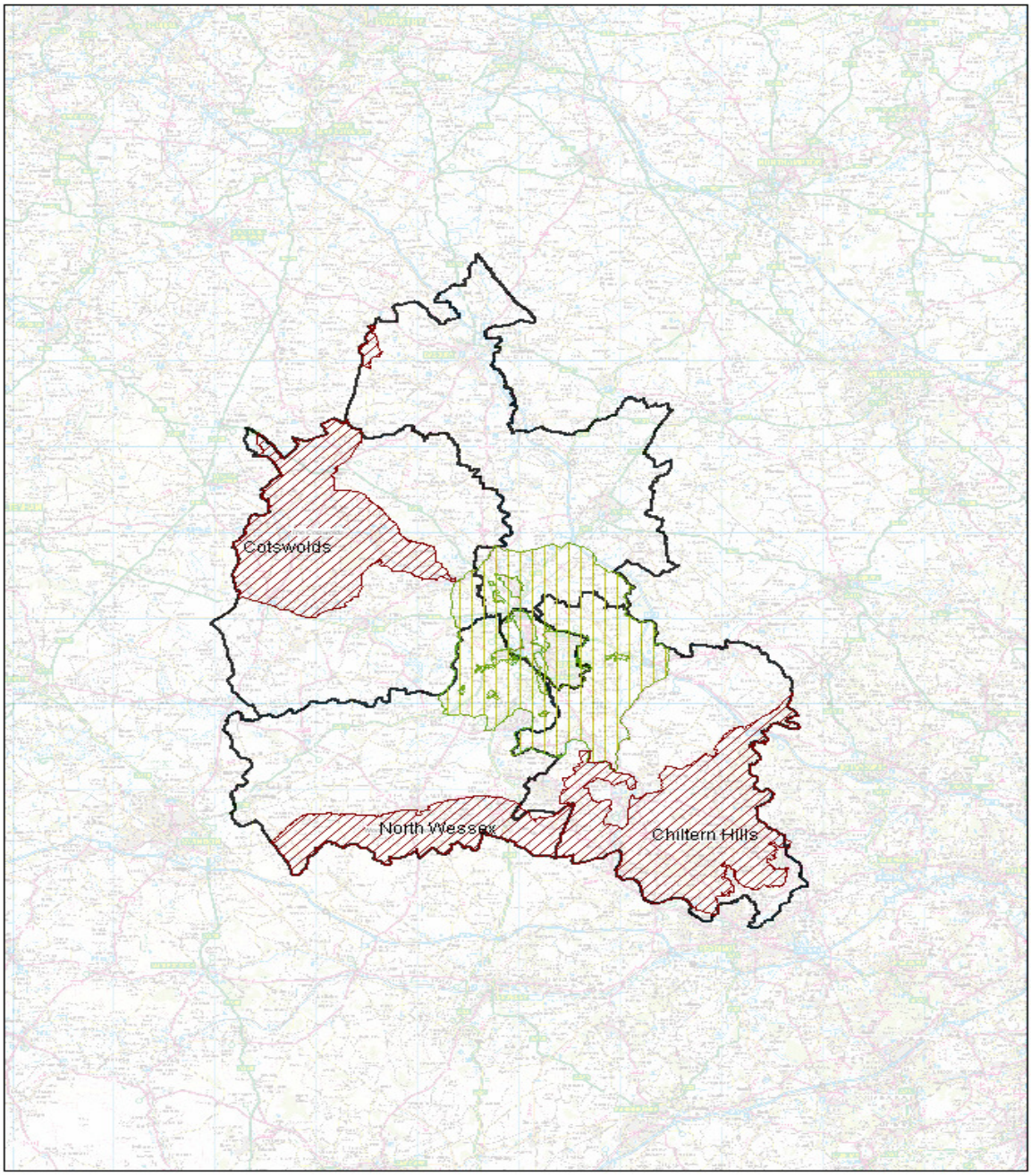

Figure 2.1 Areas of Outstanding Natural Beauty (AONB) and Green Belt in Oxfordshire

The River Thames is the second longest river in Great Britain and provides the backbone of one of the most intensively used water resource systems in the world, taking advantage of the use and subsequent return of highly treated wastewater and the natural purification capacity of the river. Water resources of the river, together with associated groundwater, support significant abstractions for public water supply and to a lesser extent for industry and agriculture.

The River Thames is also one of the most important environmental features of the county and provides a diverse range of habitats, including a vital corridor for migration. These habitats all have their own particular flow and level requirements that need to be protected. The Thames is also highly valued for its navigational and recreational uses, which also have their own flow and level requirements. Tributaries of the Thames which flow through Oxfordshire include the Rivers Cherwell, Ock, Thame, Evenlode, Windrush and Ray. Chemical and biological river quality varies considerably across the county.

Despite the resource that the river provides, the Thames Water region is one of the driest in the country and the Environment Agency has classified the majority of the water catchment areas within Oxfordshire as 'no water available', 'over-licensed' or 'over-abstracted'.

Oxfordshire is particularly vulnerable to flooding along several of its river valleys, including the Thames valley and the Evenlode. Approximately 3,500 properties located throughout the Oxford floodplain are at risk including areas within Osney, Botley, South Hinskey, North Hinksey and Wolvercote[6]. Climate change in Oxfordshire is likely to result in warmer, drier summers, and milder, wetter winters with an increased risk of flooding7.

Households in Oxfordshire emitted between 2.1 and 3.4 tonnes of carbon dioxide (CO2) per person during 2004, above the UK and SE averages for all districts except Oxford City. In 2004 domestic sources accounted for 25% of the county's total CO2 emissions and road transport for 33%. Traffic and associated congestion continues to increase in Oxfordshire which will have implications for county emissions of CO2. In the twenty years from 1981 to 2001, the total number of cars owned by Oxfordshire households increased at a rate more than double the growth of households (78% versus 35%). The district with the highest ratio of cars per household is South Oxfordshire with 1.45, highlighting the car dependency of rural households.

Seven Air Quality Management Areas have been designated in the county, primarily due to road traffic emissions. The AQMAs include some streets in the central area in Oxford City, Green Road roundabout in Oxford, central Henley on Thames, Horsefair in Chipping Norton, and the main streets in the centre of Abingdon, Witney and Wallingford. With the exception of these areas, air quality in Oxfordshire is good. Weather conditions associated with episodes of poor air quality in summer are likely to become more frequent as a result of climate change.

Oxford has good rail accessibility, on the Reading to Birmingham line, cross country from London to Worcester and with a branch line to Bicester. Didcot lies on the inter-city line from London to Bristol and S Wales and East Oxfordshire has good accessibility to the Chiltern line, which passes through Bicester on the Birmingham-London Marylebone line. West Oxfordshire has generally poor accessibility to rail travel, apart from the Worcester line.

[6] http://www.environment-agency.gov.uk/regions/thames/323150/335688/1113336/?lang=_e, accessed 22nd August 2008.
[7] Oxfordshire's Sustainable Community Strategy: Briefing Paper 6: Environment (August 2007).

The proportion of travel by public transport to the central area of Oxford is high (33%) but travel by public transport to the rest of Oxford is much lower (11%). Public transport provision for travel from rural Oxfordshire to Oxford is a significant part of the county's emerging transport strategy.

Transportation of both minerals and waste is an issue for Oxfordshire, given its rural character. The most common means of transportation of aggregate and of bulk movement of waste is by Heavy Goods Vehicle (HGV), which has implications for road safety, air pollution, noise and road congestion. There are a number of rail depots which handle aggregate; Hinksey sidings - Oxford, Oxford Road - Kidlington, Appleford Sidings - Sutton Courtenay and Hennef Way - Banbury.

2.3.4 Economic Profile

Oxfordshire has one of the strongest economies in the South East and is globally competitive in areas such as high performance engineering, bioscience, medical instruments and publishing. The Oxfordshire economy is relatively self-contained with the majority of its workforce (around 85%) resident in the County. Oxford is the principal employment centre, but there is significant economic activity centred on Banbury, and potential to expand the level of economic activity centred on Wantage and Didcot. Economic activity in the County is characterised by micro businesses, and small and medium enterprises - 95% of Oxfordshire enterprises employ fewer than 20 people.

Economic forecasts indicate an increase in jobs in the county of between 51,200 to 75,400 between 2001 and 2026 (Draft South East Plan 2005). Of the total workforce of around 309,000 people, 206,000 are employed in urban areas with the most significant concentration being 85,700 in Oxford City. Almost exactly 100,000 people are employed in Oxfordshire's rural areas (i.e. in settlements of less than 10,000 people – this includes Harwell Science and Innovation Campus, Milton Park and other rural business parks). 23% of employees in rural areas are home based compared with 11% in urban areas. Workplace-based earnings for full-time workers in Oxfordshire averaged £543 in 2006, 1% below the English average (£547) and 4% below the South East average (£567)[8].

With 85,700 people or 28% of the county's employment, Oxford is the centre of a city-region that attracts business activity and inward investment as well as inward commuting from across the county. Concentrated pockets of multiple deprivation are found in urban centres – in general, the larger the centre, the larger the pocket of deprivation. Severe pockets of deprivation and under-performance affect about 15% of people in Oxford and Banbury and all districts have at least one area in the most deprived 20% on the education and skills domain. In rural areas, there is widespread deprivation in the form of poor access to services.

Despite Oxfordshire's overall prosperity and strong economic performance, there are concerns about global competitiveness, particularly in the high-tech sector. Market towns are struggling to maintain their viability as service and retail centres in the face of competition from larger retail centres and the internet. Mineral activities offer employment for local people with a range of skilled and unskilled jobs available.

[8] Oxfordshire Quarterly Economic Update: March 2007 Oxford Economic Observatory, School of the Built Environment, Oxford Brookes University.

2.3.5 Minerals

Several important aggregate mineral resources are present in Oxfordshire. Sand and gravel is the most predominant, occurring extensively along the Thames and Cherwell valleys. Soft sand is present in south west Oxfordshire, often in conjunction with limestone. In the north of the county, ironstone and limestone are present and in the south west of the county, there is a deposit of Fuller's Earth, which is not worked at present. Oxfordshire was a net importer of sand and gravel in 2009. Sales of sand and gravel in Oxfordshire in 2010 were 0.60 million tonnes, and sales of crushed rock were approximately 0.27, million tonnes. Significant quantities of crushed rock are imported from the Mendips by rail for highway construction. Production of aggregates from recycled construction and demolition waste and from secondary materials, such as pulverised fuel ash from Didcot A power station has increased in the county. The Didcot plant is due to cease operations in 2015 although the production of secondary aggregates will to some extent be replaced by the incinerator bottom ash from the Ardley EfW plant, when this becomes operational.

The maps below show the location in the county of the sand and gravel reserves, and the limestone and ironstone reserves.

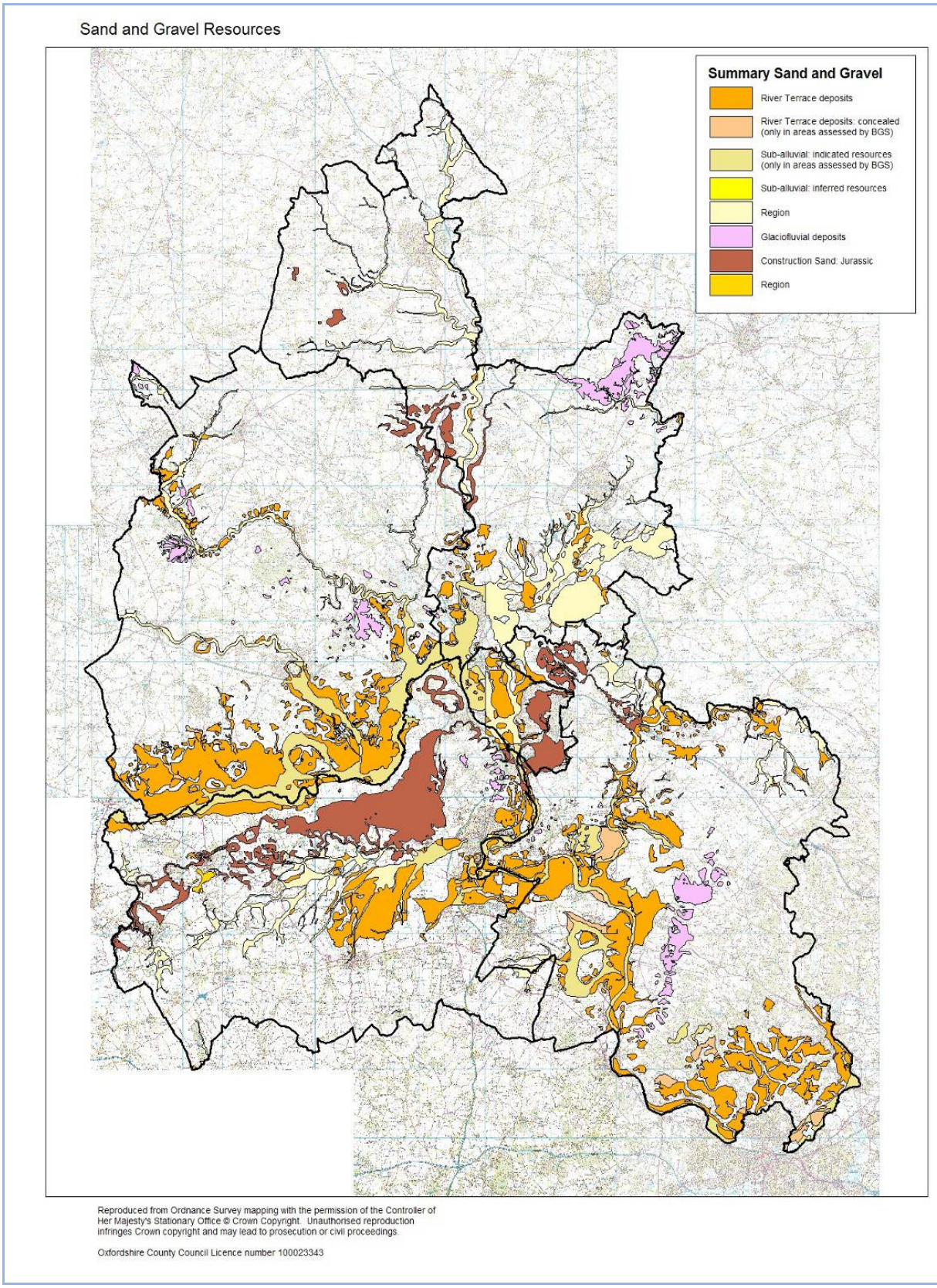

Figure 2.2 Sand and Gravel Resources in Oxfordshire

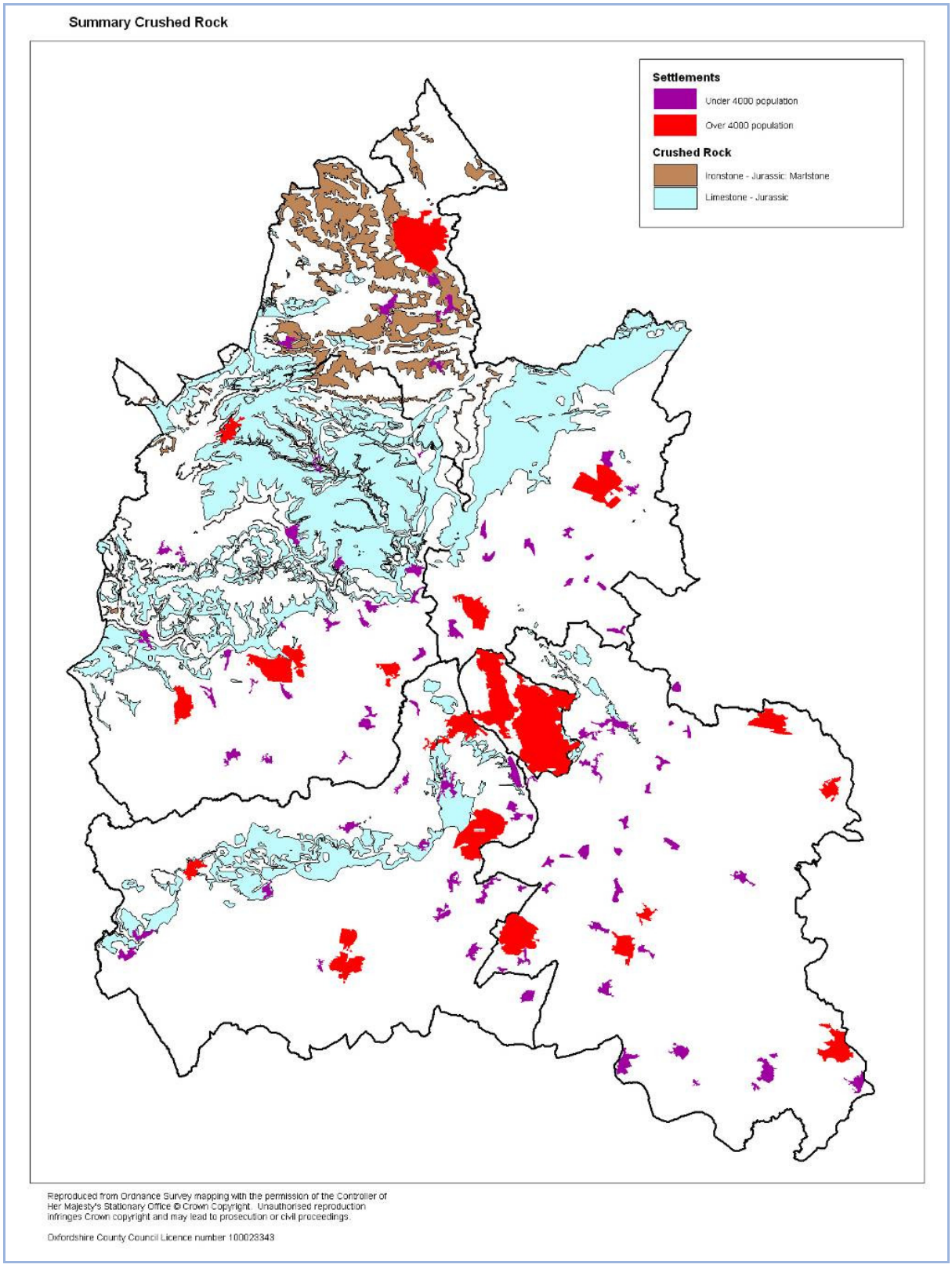

Figure 2.3 Crushed Rock Resources in Oxfordshire

Mineral working can be a highly disruptive activity which can lead to loss of land from agricultural production, potential damage to wildlife habitats and archaeological features as well as lead to disturbances associated with quarrying operations including noise, traffic and dust. However, it also presents opportunities for restoration to create wildlife habitats, increase biodiversity and improve recreational opportunities. Work has been done by OCC officers and biodiversity groups to identify which nominated minerals sites in Oxfordshire could offer opportunities for habitat creation, as part of the RSPB's Nature After Minerals initiative.

Much of the main sand and gravel resource to the North of the River Thames in the west of the County lies on best and most versatile agricultural land, mostly Grade 2 and Grade 3a. Some of the sand and gravel deposit in South Oxfordshire lies on Grade 1 agricultural land.

Present movements of aggregate material from local quarries is by road transport in Oxfordshire, which generates a large number of HGV movements, concentrated in specific areas of the county such as in the Lower Windrush Valley, around Stanton Harcourt, Cassington, Standlake and in the Sutton Courtenay area. The cumulative impact on these localities is potentially significant and damaging both to the highway network and to residential amenity. Any significant increase in working in these areas will contribute to congestion which is already experienced by drivers on the A40, linking Witney and Oxford, and on the A34.

A recent review of planning permissions for construction and demolition waste recycling facilities for production of aggregates indicates a total production capacity in Oxfordshire of 385,000 tonnes per annum. Much of this capacity is in facilities that have planning permission for a temporary period only. This is significantly less than the Oxfordshire target for 2016 of 0.9 million tonnes per annum proposed in the draft South East Plan. Oxfordshire's current apportionment is 1.82 million tonnes (mt) of sand and gravel, and 1.0mt of crushed rock per annum[9]. The National and Regional guidelines for aggregates provision in England 2005-2020 (DCLG, June 2009) show a modest decline in the forecast national demand for aggregates between 2005 and 2020 compared with the previous (2003) guidelines. This masks a more significant decline in forecast demand for some regions, particularly the South East.

[9] Policy M3 of the Regional Planning Guidance 9 apportions the regional aggregates requirement between Mineral Planning Authorities.

2.4 Sustainability Issues and Problems

Following the policy context and baseline review, key sustainability issues facing minerals and waste planning in Oxfordshire were identified. These are listed below with a focus on those relevant to the MCS (the list excludes some issues that are specific to waste):

- Population growth will lead to increased waste production and demand for waste management facilities and for aggregates for construction, across the whole county.
- Economic growth in Oxfordshire, which has slowed down behind neighbouring sub-regions in recent years, should be encouraged. Minerals and waste development could support economic growth through the provision of opportunities for unskilled labour.
- Tourism represents an important part of Oxfordshire's economy. Minerals and waste development could detract from initiatives to encourage people to visit the whole county, not just Oxford. However, post mineral restoration could create opportunities for rural development and recreational facilities.
- Climate change poses a threat to parts of the county through flooding. Minerals and waste development could meet this challenge not only by managing the positive and negative aspects of development in the floodplain, but also by encouraging working practices that minimise greenhouse gas emissions.
- Increased traffic generation on both motorways and major roads in the county leads to congestion and contributes towards a reduction in air quality. Minerals and waste development should balance reducing air pollution by employing the 'proximity principle' with ensuring that minerals and waste transport minimises environmental impacts by using suitable roads.
- Seven Air Quality Management Areas have been identified in Oxfordshire, where levels of NO^2 from traffic exceed recommended government levels. Minerals and waste developments need to manage their transport routes in order to reduce the negative impact on air quality, and to avoid exacerbating pollution levels in existing AQMAs.
- Oxfordshire has low rainfall levels and the Thames Water area is one of the most water stressed in the country. Population growth and smaller household size will increase demand for water. The review of abstraction licences by the Environment Agency may result in smaller numbers of licences being permitted. Thames Water has proposed that it build a new reservoir in Oxfordshire to meet rising demand; this may result in increased demand for aggregate for a temporary period.
- Minerals and waste site development will be constrained by the hierarchy of sites identified in PPS9 for their biodiversity value. Minerals and waste development could negatively impact on these sites. Restoration of minerals sites may be constrained by the designation of airfield safeguarding zones across much of Oxfordshire, which reduce the risk of bird strike to aircraft. It may also be constrained by a lack of available inert fill to restore sites to uses such as reed bed or wet woodland.
- Mineral and waste development offers opportunities to improve access to rural areas create recreational facilities and contribute towards habitat creation in the County.

- Oxfordshire is a county which has a rich historic built environment. Minerals and waste development could result in the loss or destruction of some of the historic assets of the county such as Regionally Important Geological Sites, geological SSSIs or Scheduled Ancient Monuments.
- Oxfordshire has plentiful sand and gravel resources, having approximately one third of the unconstrained gravel resource in the South East region. Possible increases in the sub-regional apportionment for the county may require a significant increase in mineral working in the county. Identifying sites for mineral extraction should take into account the cumulative effect of extensive mineral working on local communities and the transport infrastructure.
- The extraction of plentiful sand and gravel resources in the county must be balanced against the potential loss of best and most versatile agricultural land which could result from extraction.
- Water quality in Oxfordshire's rivers could be improved. Minerals and waste development could contribute to the pollution of water courses.

2.5 SA Framework

In order to appraise the effects of the MWDF on sustainability, a series of Sustainability Objectives were developed during the scoping stage. These were developed and consulted on with key stakeholders and statutory consultees. They provide the benchmark for undertaking the appraisal and cover the full range of environmental impacts stipulated by the SEA Directive and Regulations, as well as economic and social issues relevant to Oxfordshire.

The objectives are underlain by detailed sub-objectives (appraisal criteria) which amplify the broad objectives and allow for the appraisal to capture the different level of detail as appropriate. They are also accompanied by indicators to aid in future monitoring and testing MWDF performance against current baseline. Table 2.5 below shows the SA Objectives that have been used to appraise the emerging MCS policies.

Table 2.1 SA Framework (objectives)

SA Objective	Appraisal Criteria/Sub-objectives	Possible Indicators
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	Will the MWDF protect, maintain and enhance UK BAP Priority Habitats?	Number of permitted applications for minerals and waste development which include a restoration scheme which contributes to the objectives of Oxfordshire Habitats Plans for the creation of calcareous grasslands, lowland acid grassland and reedbeds
		Number of planning applications which have an impact on designated sites or BAP habitats
	Will the MWDF conserve and enhance internationally, nationally and regionally important sites of nature conservation importance?	Number of permitted applications which result in restoration of favourable/favourable recovering condition or buffering of designated areas through appropriate habitat creation.
	Will the MWDF protect, maintain and enhance UK BAP Priority Species?	Number of permitted applications for minerals and waste development which include a restoration scheme which contributes to the objectives of Oxfordshire Species Plans.
	Will it contribute to the aims of the Conservation Target Areas?	Contribution of the MWDF policies to Conservation Target Areas for restoration of minerals and waste management sites.
	Will it protect and conserve geological SSSIs and RIGs?	Number of permitted applications which include conditions for the protection or enhancement of RIGS or geological SSSIs.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	Will the MWDF conserve and enhance Oxfordshire's AONBs & their settings and take into account guidelines associated with specific landscape types?	Number of permitted applications for Minerals and Waste development which include conditions for the protection or restoration of statutory or non-statutory landscape designations.
	Will the MWDF protect and enhance the historic and prehistoric environment of Oxfordshire?	Number of permitted applications for Minerals and Waste development which include conditions for the protection or enhancement of the historic and prehistoric environment in Oxfordshire.

3. To maintain and improve ground and surface water quality	Will the MWDF affect groundwater quality?	Number of permitted applications affecting source protection zones 2 and 3 Number of permitted applications which assess the risk of contamination of groundwater
	Will the MWDF affect surface water quality?	Number of sites within 50m of a watercourse
		Number of permitted applications requiring abstraction licences
4. To improve and maintain air quality to levels which do not damage natural systems	Will the MWDF lead to increased traffic congestion in built up areas?	Number of permitted applications with routeing agreements which avoid AQMAs Survey of trip generation to civic amenity sites
	Will the MWDF lead to increased dust and/or odours?	Number of complaints relating to dust/odours
5. To reduce greenhouse gas emissions to reduce the cause of climate change	Will the MWDF lead to a decrease in production of greenhouse gases such as methane?	Proportion of waste and aggregates transported by rail or water Quantity of biodegradable wastes landfilled
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	Number of sites that are permitted within flood risk zone as identified by PPS25.	Number of permitted sites for minerals and waste development within the flood plain (flood zone 3a/) Number of mineral restoration schemes identified for flood attenuation
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	Will the MWDF reduce distances travelled by road?	Distances travelled by road from new applications to settlements (waste) or markets Number of sites with rail/water access
	Are sites in the MWDF well located in relation to surrounding settlements for waste, or minerals for markets?	Number of sites with suitable access to appropriate roads
	Will the waste facilities or mineral operation serve local needs?	
	Does the MWDF facilitate HGV routeing agreements and developer contributions for infrastructure	

	improvements?	
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	Will the MWDF have impacts which could have a harmful effect on human health? Will the MWDF result in loss of amenity through visual impact, noise, dust or vibration for local communities? Will the MWDF provide opportunities for enhancement of local amenity and access to the countryside?	Number of permitted applications for mineral or waste development within 250m of sensitive receptors (settlements) Number of sites for mineral or waste development within 250m of sensitive receptors (settlements) Number of permitted applications with restoration conditions which enhance local amenity and /or improve access to the countryside.
9. To protect, improve and where necessary restore land and soil quality	Will the MWDF affect high grade agricultural land? Will the MWDF lead to soil pollution or contamination?	Area of high grade agricultural land lost to minerals and waste development Incidences of land contamination related to minerals and waste development
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	Will the MWDF policies reduce the amount of waste produced?	Amount of waste arising in Oxfordshire
11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment		Number of permitted applications for waste management to meet targets to achieve net waste self sufficiency. Number of permitted applications which contribute to meeting apportionment.
12. To support Oxfordshire's economic growth and reduce disparities across the county.	Will the MWDF encourage the provision of more locally based skills and facilities? Will the MWDF generate new jobs for the county?	Number of direct jobs created in the waste/mineral sector per year

	Will the MWDF support and encourage the growth of small and medium size business?	Number of new mineral and waste permissions

3 Appraisal Methodology

3.1 Approach

Planning Policy Statement 12 paragraph 4.43 states that: "*The Sustainability Appraisal should perform a key role in providing a sound evidence base for the plan and form an integrated part of the plan preparation process. Sustainability assessment should inform the evaluation of alternatives. Sustainability assessment should provide a powerful means of providing to decision makers, and the public, that the plan is the most appropriate given reasonable alternatives.*"

The approach adopted in undertaking the appraisal involved the following key tasks:

- Testing the MCS vision and objectives against the SA objectives;
- Testing the emerging issues and options against the SA objectives;[10]
- Testing the emerging policies (Preferred Strategy MCS) against the SA objectives.

The appraisal involved a textual analysis of the potential effects of the implementation of the emerging policies. The assessment was a qualitative exercise based on professional judgement taking into account the information gathered in the Scoping report and other available background information relevant to the issues raised.

Each emerging policy was assessed in terms of the nature of its impacts (beneficial/adverse/neutral/uncertain), its relative magnitude and duration over time. Matrices were used to identify the sustainability effects and these are provided in Appendix A.

[10] Relevant reports include the SA of Oxfordshire Minerals Spatial Strategy Options February 2010, Revised Minerals Spatial Strategy Options September 2010 and Aggregates Apportionment Options July 2011.

4 Appraisal Findings

4.1 Vision

The vision for Oxfordshire's minerals planning strategy is that:

a) *In the period to 2030, the supply of aggregate materials to meet the development needs of Oxfordshire and help sustain its world class economy will be met by:*
- *an increased use of secondary and recycled aggregate materials;*
- *a reduced proportion of locally produced sand and gravel, soft sand, limestone and ironstone; and*
- *the continued import of materials such as hard crushed rock that are not available locally.*

b) *Mineral working will be located and managed to minimise:*
- *the distance that aggregates are transported by road;*
- *the use of unsuitable roads through settlements; and*
- *other harmful impacts of mineral extraction and transportation on Oxfordshire's environment and communities.*

c) *The restoration of mineral workings will enhance the quality of Oxfordshire's natural environment and the quality of life for Oxfordshire residents by:*
- *contributing to the creation of habitats and protection of biodiversity, particularly in relation to the Conservation Target Areas; and*
- *providing access to the countryside and opportunities for recreation.*

SA Findings – When assessed against the SA framework objectives, the proposed vision was found to appropriately address all of the sustainability objectives with the exception of Objective 6 which addresses climate mitigation and adaptation. Additional text to address this objective should be considered. The proposed vision as worded would generate positive or very positive impacts in relation to all of the identified sustainability objectives, with the exception of Objective 6 (as noted above).

4.2 Objectives

In order the deliver the above proposed vision, the Council has prepared the following strategic objectives:

i. *Enable Oxfordshire to meet the locally determined requirements for supply of sand and gravel, soft sand, crushed rock and secondary and recycled aggregates over the plan period to meet planned economic growth and social needs.*

ii. *Enable a continued supply of limestone and ironstone for building and walling stone from small scale quarries for the maintenance, repair and construction of locally distinctive buildings and structures.*

iii. *Provide a framework for investment and development by mineral operators and landowners through a clear and deliverable spatial strategy which is sufficiently flexible to meet future needs and which is based on existing and planned infrastructure provision.*

iv. *Facilitate the economically and environmentally efficient supply of minerals in Oxfordshire and encourage the maximum practical recovery of aggregate resources from secondary and recycled materials for use in place of primary aggregates.*

v. *Minimise the impact of mineral development on climate change by identifying areas for mineral extraction which reduce the need to transport minerals and which minimise the impact of mineral working on areas vulnerable to flooding.*

vi. *Minimise the distance minerals need to be transported by road and encourage where possible the movement of aggregates by conveyor, rail and on Oxfordshire's waterways in order to reduce adverse impacts of mineral transportation on local communities and the environment; and minimise the impact of mineral traffic on local communities through implementation and monitoring of routeing agreements.*

vii. *Protect Oxfordshire's important landscapes and ecological, geological and heritage sites, and archaeological and heritage assets from harmful impacts of mineral development and transportation.*

viii. *Provide benefits to Oxfordshire's natural environment and local communities through the restoration of mineral workings by contributing to nature conservation, enhancing the quality and extent of Conservation Target Areas, contributing to landscape character, improving access to the countryside, safeguarding local amenity and providing opportunities for local recreation.*

ix. *Safeguard resources of sand and gravel, crushed rock, building stone and Fuller's Earth to ensure that these resources are potentially available for future use and are considered in future development decisions; and*

x. *Safeguard permanent facilities for producing secondary and recycled aggregate and for importing aggregates into Oxfordshire by rail.*

SA Findings – Overall, the proposed objectives were found to be compatible with the SA objectives. No incompatibility was found between the SA objectives and the Minerals LDF objectives. The Minerals LDF objectives seek to manage Oxfordshire's mineral planning needs in a way that protects the valued natural environment (objectives iv, vi, vii and viii), contributes to economic growth (objectives I, iii, iv, and ix) as well as ensuring communities are provided with adequate facilities to meet anticipated needs in a manner that protects their health and safety (objectives vi, viii, ix, and x). Objectives v and vi supports reducing the need to transport minerals significant distances by road and this is further supported by Objective x. Together these objectives have the potential to reduce the negative impacts associated with HGV movements in specific areas of the County including: addressing the serious congestion on the County's roads, lowering the high level of GHG emissions per capita (currently above both UK and SE averages), reducing air and noise pollution and other local amenity impacts experienced by local communities in mineral working areas.

4.3 Strategic Policies

4.3.1 Policy M1: Provision for Secondary and Recycled Aggregates

Policy M1 seeks to make a sustainable contribution to Oxfordshire's sub-regional minerals apportionment for secondary and recycled aggregates based on a local assessment of supply[11] and consistent with the South East Plan target (Policy M2 – 0.9 million tonnes per year). The anticipated production varies from 400,000 to 550,000 with a level of uncertainty yet to be verified[12]. Further capacity and production are anticipated from mobile plant (approx 25%[13]) but this target is recognised as ambitious as rates of utilisation are already high and secondary and recycled aggregates are not currently substituted for primary aggregates in structural uses, only in lower specification construction uses like car parks.

Production of secondary/recycled aggregates is recognised as having environmental effects broadly similar to those caused by processing of primary aggregates. The nature of any adverse impacts will depend to some extent on the exact location of sites for secondary and recycled aggregates allocated through the Sites Allocations DPD and the application of the Common Core Policies to any individual applications for production of secondary/recycled aggregates, including the proximity of such facilities in relation to sensitive receptors. Where these facilities exist in close proximity to active mineral workings there are likely to be negative cumulative effects of a temporary but sustained nature. The adverse effects arising from the operation of temporary mobile units associated with individual developments are likely to be of a much more temporary and local nature than facilities which hold long term consents.

Restoration schemes for those secondary/recycling sites which are no longer needed will be required to address biodiversity, landscape, water and soil restoration objectives. A cross reference to Policy M6: Restoration of Mineral Workings in the supporting text to this policy is therefore recommended

The apportionment will support Oxfordshire's economic growth over the long term and in particular growth of the local economy, as recycling facilities tend to be located at existing quarries and landfills, thus continuing to support local jobs and businesses.

4.3.2 Policy M2: Provision to be made for Mineral Working

The adverse effects which might arise from a particular volume of mineral working in the County are difficult to predict based on the apportionment figure alone, as it is the spatial implications, i.e. the location and distribution of mineral working sites which make up the apportionment which will determine the effects. The proposed spatial distribution of this apportionment is appraised through Policy M3. However it can be expected that the adverse environmental and social effects of the proposed apportionment level might be less adverse than those experienced under the delivery of the current policy - Policy M3 of the South East Plan, which requires a higher level of provision or the Secretary of State's proposed changes to Policy M3, which would require an even higher level of supply. The policy makes provision for aggregate supply to support the expected economic growth, based on a local assessment of future aggregate demand by consultants Atkins (January 2011[14]).

[11] Local Assessment of Aggregates Supply Requirements Final Report January 2011 Prepared for Oxfordshire County Council by Atkins Ltd
[12] Ibid
[13] Ibid
[14] Ibid

4.3.3 Policy M3: Strategy for the Location of Mineral Working

Soft sand and gravel:
Seeking to concentrate extraction in areas where working is currently taking place or has taken place recently has the economic advantages of using existing infrastructure as well as labour force. It also presents opportunities for co-ordinated large-scale restoration projects which would in the longer term lead to beneficial effects for the local communities (through recreation and leisure opportunities) as well as for wildlife. However, there is still potential for cumulative negative effects in the short to medium term on the local communities especially with regard to traffic and amenity issues unless appropriately mitigated. Potential adverse effects on nature conservation objectives and in particular designated European Sites will need to be addressed at the Site Allocation stage, and potentially at the individual application stage, in particular the potential impacts on the hydrology of Oxford Meadows and Cothill Fen SACs. Measures to mitigate against negative effects on the already extensively modified landscapes should be required at site selection and planning application stages.

Soft sand:
Identifying two areas of working in the south of the county and one in the north of the county will help minimise traffic impacts as well as spread the effects of soft sand working more equitably. However, there will be some cumulative effects on communities living close to existing sites and careful consideration should be given when identifying sites and allowing further extraction so as to minimise the overall effects of continued working in these areas. The two areas in the south west of the county have different quality sands and the policy appropriately allows for the working of the two types of sand. Continuing with the existing pattern provides certainty to industry and also takes advantage of existing infrastructure. Potential adverse effects on nature conservation objectives and in particular designated European Sites will need to be addressed at the Site Allocation and/or individual planning application stage.

Crushed rock:
The revised crushed rock policy would lead to a distribution of effects of crushed rock working in the county therefore potentially preventing adverse effects on a single locality. This policy takes advantage of existing infrastructure as well as continuing to provide local employment. This has positive economic benefits. In the long term, there is potential for adverse cumulative effects on the communities living near the identified areas. Careful consideration should be given to the exact location of sites and works, relative to housing and other sensitive receptors to mitigate against potential additional adverse effects to those already experienced.

Where there is potential for adverse effects due to proximity to nature conservation sites, mitigation measures should be put in place to protect these areas.

Cumulative effects:

Sharp sand and gravel:
Due to continued working in the Lower Windrush Valley, Eynsham / Cassington / Yarnton and Caversham there is potential for long-term adverse cumulative effects on the environment and on the local communities from sharp sand and gravel working. These include ecological, visual and local landscape impacts, air and noise pollution from HGV movements, traffic congestion, GHG emissions and

impacts on the water environment. In Sutton Courtenay, cumulative effects would be felt in the short-medium term (to 2020) after which production is planned to cease in this area. Cholsey is then expected to experience similar impacts, although these should be addressed through the Site Allocations DPD process and individual applications.

Appropriately, the policy will not lead to an overall increase of working activity in west Oxfordshire, or of the attendant cumulative impacts in this area where there has already been extensive working.

Soft sand:
In the long-term, there is potential for cumulative adverse effects on the environment and local communities due to soft sand extraction although these are not envisaged to be significant due to the small quantities of soft sand which will be produced.

Crushed rock:
Continued working in the existing areas has potential for adverse cumulative effects over time on the local communities including on landscape and local amenity – noise, air, dust and traffic impacts. Mitigation measures at the planning application stage can help reduce such impacts. It is also envisaged that there will be no significant increase in working in any one particular area and so no significant additional adverse cumulative effects are expected on top of those already experienced.

4.3.4 Policy M4: Aggregates rail depots

Policy M4 seeks to safeguard the necessary infrastructure to transport imported aggregates by rail, reducing the long term cumulative adverse impacts on the environment and local communities experienced by long distance transport of aggregates by road. It will also have subsequent positive impacts on reducing air pollution and GHG emissions and supports sustainable growth of the Oxfordshire economy.

4.3.5 M5: Mineral safeguarding

The proposed policy recognises that in-situ mineral resources must not be sterilised by non-mineral development and that mineral deposits are finite and scarce resources that must be safeguarded for the long term, including unknown future requirements for an increasing population and economic growth.

Potential impacts which might arise when safeguarded areas are worked will be dependent on the exact location of sites to be worked within those areas. Potential impacts should be addressed through the planning application process, should such sites be proposed for development. Where there is potential for adverse effects on the environment and local communities, these should be adequately mitigated against. Until the point of exploration and extraction, no adverse impacts on sensitive receptors are expected. There is potential for short term positive impacts, in that other, more permanent development does not take place in the safeguarded areas – leaving natural habitats relatively undisturbed, and current air, soil and water quality maintained or even possibly improved over the medium period. Likewise, local communities, landscapes and built heritage may benefit from a lack of more permanent development that might otherwise generate adverse impacts, including increased flood risk or congestion on the local and strategic road network.

4.3.6 M6: Restoration of mineral workings

The requirement for prompt and phased restoration to an after-use appropriate to the location, transport network capacity and amenity of local communities will

have a positive long term impact on many of the SA objectives as it provides an opportunity to create or restore habitats and biodiversity, restore landscape character, improve water and soil quality; and address possible amenity impacts on local communities arising from the after-use of minerals sites. It also provides opportunities to develop new local amenity facilities, such as sport and recreational uses which can provide new business opportunities and reduce disparities in access to such facilities for rural communities. Extended management responsibility is important however, to maintain long term benefits, and this is appropriately recognised by the policy.

It should also be noted that mineral working and after-use in the flood plain can offer opportunities to increase flood water storage capacity and reduce the risk of flooding elsewhere, which will be important in the longer term, given the predicted effects of climate change. The sustainability of the policy could be improved in relation to SA Objective 6 by reference to this opportunity.

4.4 Common Core Policies for Minerals and Waste

4.4.1 Policy C1: Flooding

Policy C1 will have positive effects on a number of the SA objectives insofar as it protects valued habitats, flora and fauna, built heritage, landscapes, valuable agricultural land, local communities and businesses from damage, disruption and distress caused by flood events. However the sustainability of the policy in relation to SA objective 6 could be improved by reference to the future predicted impacts of climate change and the incorporation of adaptation measures to account for this, including any likely increased flood risk.

4.4.2 Policy C2: Water Environment

Policy C2 has a positive impact on many of the SA objectives, as water quality and quantity are an essential precursor to the proper functioning of ecosystems, landscapes, businesses and local communities. The sustainability of the policy in relation to Objective 8 could be improved by explicitly referring to the recreational values of maintaining water quality/quantity as well, as the River Thames for example, is a very important recreational resource for the county.

4.4.3 Policy C3: Environmental and Amenity Protection

Policy C3 seeks to protect the environment, residential amenity and other sensitive receptors from unacceptable adverse impacts. The ‘environment’ and ‘other sensitive receptors’ can be construed to include those SEA elements covered by the SA objectives, including biodiversity, landscape character and historic and built heritage, air and water; but it would be helpful if the policy could be more explicit in defining what constitutes the ‘environment’ or a ‘sensitive receptor’ in order to give more guidance to developers. It would also be helpful to provide some guidance as to what might constitute an “unacceptable adverse impact”. In addition, the potential impacts on human health, not just residential amenity should be considered (to comply with the SEA Directive requirements to consider effects on human health as captured by SA objective 8), and it might also be appropriate to consider local businesses as sensitive receptors, particularly where such businesses are dependent on a high quality environment and good amenity (e.g. tourism sector).

A cross reference in the supporting text to the Common Core Policies which deal with distinct elements of the ‘environment’ would also be helpful – for example to highlight linkages with Policy C2 for ground and surface water, Policy C4 for

Biodiversity and Geodiversity, Policy C5 for Landscape and Policy C6 for the Historic Environment and Archaeology.

4.4.4 Policy C4: Biodiversity and Geodiversity

Policy C4 will have a positive impact on many of the SA objectives – as the protection of biodiversity provides many direct and indirect benefits for other SEA elements. Biodiversity/geodiversity features are essential elements of landscape character and quality. The proper functioning of ecosystem services which are provided by the flora and fauna resident within Conservation Target Areas will have long term positive impacts on air, water, soil, human health and the economy. Other long term benefits include reduced flood risk and carbon capture.

4.4.5 Policy C5: Landscape

Policy C5 will have a positive impact on many of the SA objectives – as the protection of landscape quality and character provides many direct and indirect benefits for other SEA elements. For example the proper functioning of ecosystem services which are provided by the flora and fauna resident within these landscape features will indirectly but positively impact over the long term on air, water, soil, human health and the economy, and provide such benefits such as reduced flood risk and carbon capture.

4.4.6 Policy C6: Historic environment and archaeology

Policy C6 has a positive impact on SA objective 2 as it relates to the protection of the historic and built heritage. It also has indirect positive impacts on a number of the other SEA elements, in particular landscape character, biodiversity and the economy. There is no direct relationship between this policy and the other SA objectives.

4.4.7 Policy C7: Transport

Transportation of minerals that maintains or improves environmental and residential amenity has potential for positive impacts on biodiversity, landscape character and built heritage, local communities, businesses and sensitive biodiversity/soil/water features in the vicinity of roads used by minerals traffic. Reducing the number of road miles travelled to reach markets and addressing congestion through an efficient road network is likely to have a positive impact on SA objectives for air quality and greenhouse gas emissions, as a result of subsequently reduced air emissions from minerals traffic, as well as facilitating the efficient functioning of those businesses that rely on the road network. The policy aims to provide the necessary and appropriate infrastructure to ensure that minerals are sustainably transported to their markets, thus positively assisting to meet Oxfordshire's sub-regional apportionment and supporting continued economic growth.

4.4.8 Policy C8: Rights of Way

Enhancements to the public rights of way network should have a long term indirect positive effect on a number of the SA objectives, by encouraging people to make local trips on foot or bicycle, reducing traffic conflicts on local roads, reducing GHG emissions and improving local air quality, improving health through physical activity and generating business opportunities through recreation. Improved public access can also indirectly assist with the enhancement of landscape character and the settings of historic/built heritage.

Public access to restored mineral workings should be carefully managed however, so as to not adversely impact on habitats and species resident in the restored

area. A reference to this effect should be included in the supporting text to improve sustainability in relation to SA objective 1.

4.5 Cumulative Effects

There is always a degree of uncertainty associated with cumulative effects at a strategic planning level, as the principal locations identified for mineral working do not provide enough certainty as to the adverse effects that might be experienced at the operational level. Potential cumulative effects on specific receptors for example air; water and the transport network will become more apparent at the site selection stage, and will be assessed during the SA of the Sites Allocations DPD. At this stage more details will be available on allocated sites allowing for the detailed assessment of potential impacts on sensitive receptors.

The appraisal has not identified any potential **adverse** cumulative (in-combination) effects of the policies operating together, based on the predicted performance of the MCS policies against the SA objectives.

The appraisal has however identified the following potential **beneficial** cumulative (in-combination) effects based on the predicted performance of the MCS policies against the SA objectives.

- **Biodiversity and natural habitats –** Strategic Policies M4 and M6 and the Common Core Policies C1 – C7 support SA objective 1. When implemented together, these policies have potential to lead to enhancement and conservation of Oxfordshire's biodiversity and protected species.

- **Landscape character and historic features -** Strategic Policies M4 and M6 in association with Common Core Policies C1 - C7 have potential to reduce the overall potential for negative impacts on landscape character and historic features, and take advantage of opportunities to improve these elements through restoration proposals and implementation.

- **Ground and surface water quality –** Strategic Policies M4 and M6 in association with Common Core Policies C1 - C7 have potential to reduce the overall potential for negative impacts on ground and surface water quality when implemented together.

- **Air quality –** Strategic Policies M4 and M6 together with Common Core Policies C3, C4, C5, C7 and C8 have potential to reduce the overall potential for negative air quality impacts when implemented together.

- **Climate change mitigation –** The following Common Core Policies have potential for a cumulative positive impact on reducing GHG emissions – C3, C4, C5, C7 and C8. Together, these policies can help in mitigating against climate change by reducing overall GHG emissions associated with proposed minerals working and restoration schemes.

- **Flood risk** – Strategic Policies M4 and M6 and Common Core Policies C1 - C5 work together to protect areas at risk from flooding. When implemented together, these policies assist to limit vulnerable development in areas at risk from flooding, and where development is allowed, adequate mitigation measures are in place and flood attenuation opportunities are implemented.

- **Strategic and Local Road Network –** Strategic Policies M4 and M6 and Common Core Policies C3, C7 and C8 will have a positive cumulative impact on ensuring the safe and efficient functioning of the road network.

- **Local Communities and Human health** – Strategic Policies M4 and M6 in conjunction with the Common Core Policies seek to manage the effects of minerals working in a way that protects the amenity of local communities, safeguards human health and results in beneficial effects in terms of restoration proposals.

- **Soil quality –** Strategic Policy M6 and Common Core Policies C1, C4, C5, C7 and C8 will have a positive cumulative effect on restoring soil quality, through the regulation of new minerals working activity and proposals for restoration schemes.

- **Economic growth –** Strategic policies M4, M5 and M6 in combination with all of the Common Core Policies have the potential to positively contribute to local economic growth. Together, these policies have potential for cumulative beneficial effects on the local economy by creating the preconditions for a healthy functioning economy (addressing traffic congestion and ecosystem requirements, and a healthy attractive place to live and work) and maintenance/creation of business opportunities to sustain growth.

4.6 Uncertainties and risks

Sustainability Appraisal is an inherently uncertain process that involves making predictions concerning environmental and sustainability conditions on the basis of often limited data.

The main uncertainty arising from the appraisal relates to the nature of impacts likely to arise at as a result of minerals working within the various 'principal locations'. This is denoted by the symbol (?) in the appraisal matrices. The strategic nature of the appraisal and the broad nature of the principal locations make it difficult to predict with certainty the likely impacts of development in these areas. This Report has defined the potential effects of development based on current available information. The eventual impacts will depend on the location of specific sites relative to sensitive receptors, the scale of proposed development, the nature and type of operations and proposed mitigation measures.

The preparation of the Site Allocations DPD provides an opportunity for impacts to be considered in detail once potential sites have been identified. More detailed assessment will also be provided through the Environmental Impact Assessment and Integrated Pollution Prevention and Control (IPPC) processes which are required prior to planning consents and operating licences being issued by the planning authority and the Environment Agency respectively.

5 Monitoring

5.1 Introduction

In order to identify unforeseen adverse effects and to enable remedial actions to be taken, it is important to monitor the implementation of the MCS. Monitoring some of the identified indicators will also enable gaps in the existing information to be filled providing a better impact prediction basis for future appraisals and revisions of the strategy.

In order to satisfy the requirements of the SEA Directive, further monitoring relating to the effects of the MCS and the environmental baseline are proposed. It is recommended that wherever possible, these are monitored as part of the MCS monitoring as the majority of baseline information required will be relevant to both the Plan and the SA.

5.2 Effects Monitoring

It is not necessary to monitor everything or to monitor an effect indefinitely. Effects monitoring has therefore been identified where it is judged that the effect could lead to a significant effect. This is considered for both adverse and beneficial effects.

Table 5.1 Proposed Effects for Monitoring

Policy	Effects to be monitored	Proposed Indicators to be monitored
M1	• Substitution of primary aggregates by secondary and recycled aggregates	• Number of permitted applications for secondary and recycled aggregates which contribute to meeting apportionment.
M2	• Apportionment/ rate of extraction	• Number of permitted applications which contribute to meeting apportionment. • Number of new mineral permissions
M4	• Safeguarding of rail depots and provision of new rail depots	• Proportion of waste and aggregates transported by rail or water • Number of sites with rail/water access
M6	• Effectiveness of restoration of mineral workings	• Number of permitted applications for minerals and waste development which include a restoration scheme which contributes to the objectives of Oxfordshire Habitats Plans for the creation of calcareous grasslands, lowland acid grassland and reedbeds • Number of permitted applications which result in restoration of favourable/favourable recovering condition or buffering of designated areas through appropriate habitat creation. • Contribution of the MWDF policies to

		Conservation Target Areas for restoration of minerals and waste management sites. • Number of permitted applications for minerals and waste development which include a restoration scheme which contributes to the objectives of Oxfordshire Species Plans. • Number of permitted applications with restoration conditions which enhance local amenity and /or improve access to the countryside.
C1	• Flood risk and attenuation	• Number of permitted sites for minerals and waste development within the flood plain (flood zone 3a/) • Number of mineral restoration schemes identified for flood attenuation
C2	• Unacceptable adverse impacts on water quality or quantity	• Number of permitted applications affecting source protection zones 2 and 3 • Number of permitted applications which assess the risk of contamination of groundwater • Number of permitted applications requiring abstraction licences • Number of sites within 50m of a watercourse
C3	• Unacceptable adverse impacts on the environment, residential amenity and other sensitive receptors	• Number of permitted applications with routeing agreements which avoid AQMAs • Number of complaints relating to dust/odours • Number of permitted applications for mineral or waste development within 250m of sensitive receptors (settlements) • Number of sites for mineral or waste development within 250m of sensitive receptors (settlements) • Number of permitted applications with restoration conditions which enhance local amenity and /or improve access to the countryside. • Area of high grade agricultural land lost to minerals and waste development • Incidences of land contamination related to minerals and waste development
C4	• Enhancement of Conservation Target Areas and long term maintenance of BAP priority habitats • Unacceptable adverse impacts on designated sites for nature	• Number of permitted applications for minerals and waste development which include a restoration scheme which contributes to the objectives of Oxfordshire Habitats Plans for the creation of calcareous grasslands, lowland acid grassland and reedbeds • Number of planning applications which have an impact on designated sites or BAP habitats • Number of permitted applications which

	conservation and their settings • Protection of nationally and regionally important geological features from harmful development	result in restoration of favourable/favourable recovering condition or buffering of designated areas through appropriate habitat creation. • Number of permitted applications for minerals and waste development which include a restoration scheme which contributes to the objectives of Oxfordshire Species Plans. • Contribution of the MWDF policies to Conservation Target Areas for restoration of minerals and waste management sites. • Number of permitted applications which include conditions for the protection or enhancement of RIGS or geological SSSIs.
C5	• Protection and enhancement of landscape quality. • Sensitive siting, design and landscaping	• Number of permitted applications for Minerals and Waste development which include conditions for the protection or restoration of statutory or non-statutory landscape designations.
C6	• Conservation and protection of historic assets and their settings • Preservation of archaeological remains in situ	• Number of permitted applications for Minerals and Waste development which include conditions for the protection or enhancement of the historic and prehistoric environment in Oxfordshire.
C7	• Maintenance of the safety, efficiency and quality of the road network • Maintenance of residential and environmental amenity • Minimisation of road miles travelled to reach markets • Alternative transportation of minerals (rail, water, pipeline, conveyor)	• Proportion of waste and aggregates transported by rail or water • Distances travelled by road from new applications to markets • Number of sites with rail/water access • Number of sites with suitable access to appropriate roads • Number of complaints relating to dust/odours
C8	• Maintenance and enhancement of the rights of way network	• Number of permitted applications with restoration conditions which enhance local amenity and /or improve access to the countryside.

Measures to be monitored with regard to Common Core Policies will become clearer during the SA of Site Allocations DPD when potential impacts can be adequately addressed and indicators for monitoring confirmed.

5.3 Baseline Indicator Monitoring

Monitoring selected baseline indicators can also help establish a causal link between implementation of the MCS and the likely effects being monitored. Changes in the direction of indicators can be measured against the existing baseline position as well as against other comparable data (e.g. regional/national trend) to establish whether similar effects are occurring elsewhere.

This is best achieved by establishing a common set of core indicators. Oxfordshire County Council has developed a set of core indicators to monitor the performance of the MCS DPD. To avoid duplication of effort and facilitate a cost-effective and efficient way of monitoring both the MCS and the SA indicators, it is recommended that the SA monitoring is incorporated into the existing performance monitoring for the MCS.

The following baseline indicators (Table 5.1) were identified during the Scoping stage and should be monitored as part of the MCS where relevant.

Table 5.1 Baseline indicators

Table 5.1	**Baseline**	**Indicators**						
Oxfordshire MWDF SEA/SA Baseline Review								
Indicator	Oxfordshire	South East Region	UK	Target	Local trend	Indicator Status	Commentary	Source
Population								
Population	635,600	8,000,645	60,975,000		10.7% growth between 1996 and 2006			Office for National Statistics
Population density(persons/km²)	2.3/ha	4.2/ha	3.8/ha				Oxon is the least densely populated county in the SE. The MWDF needs to be aware of accessibility to amenities for a low density population.	http://www.sepho.org.uk/Download/Public/10171/1/Population%20Information%20Bulletin_1.pdf
Index of Multiple Deprivation	The county was ranked 137th out of 149 county areas in 2007						There are some areas of deprivation within the county, such as some wards in Oxford city and in Banbury	DCLG (2007) Indices of Deprivation County Council summaries
% of the working age pop in employment	81.1% in 2006				This has stayed steady around 81% since 2000			http://www.areaprofiles.audit-commission.gov.uk

Population change	1991-2001: 10.6%	1991-2001: 6.7%	1991-2001: 4.4%		Growth rates significantly above the national average.		Potential impact on demand for waste management facilities and aggregates.	Oxfordshire Data Observatory www.oxfordshireobservatory.info
Life expectancy at birth for men and women	Males:78.8 Females: 82.4	Males:78.1 Female: 82.0	Males: 76.9 females: 81.1		Improved life expectancy		There are some significant differences between wards, and between Oxford and the rest of the county.	Oxfordshire Data Observatory
Biodiversity								
% of SSSIs in favourable condition	48.1	46	45	Govt's PSA target to have 95% SSSIs in favourable or recovering condition by 2010			SSSIs in Oxford and W Oxfordshire already meet govt target	TVERC, Natural England
Area of SSSIs in recovering favourable condition	36.1	33	28	Govt's PSA target to have 95% SSSIs in favourable or recovering condition by 2010			SSSIs in Oxford and W Oxfordshire districts already meet govt target - MWDF needs to avoid negative impacts on SSSIs in recovering condition	TVERC, Natural England

% change in number of farmland birds in Oxon	-13%	-21%		2006 farmland bird PSA 1966-2005			Used by government as an indicator of trends in biodiversity	TVERC
Extent of priority habitats	6 SACs, 4 NNRs, 17 LNRs							Oxfordshire Data Observatory
Built and historic environment								
% Grade I & Grade II* listed considered 'at risk'	5 buildings considered 'at risk'	169 buildings, 5 fewer than in 2007		No buildings				English Heritage
Water Quality & Resources								
Rivers of good biological quality	86.5% in S Oxon, 19% in Oxford	78%	70%	National target of 95% rivers to reach good standard				Environment Agency http://www.sustainable-development.gov.uk/regional/se/30.htm
Rivers of good chemical quality	90.1% good quality in S Oxon, 54.3% in Cherwell	55%	62%	National target of 95% rivers to reach good standard			River quality varies greatly between districts.	http://www.sustainable-development.gov.uk/regional/se/30.htm

Daily domestic water usage	158		154.14	TW's target consumption is 158l/head/day	Expected to increase		Thames Water expects population growth, which will lead to increased demand.	The Audit Commission
Climate Change								
Total CO2 emissions per capita in 2005	10.2	8.4	9.3	Reduction of 12.5% of emissions of greenhouse gases by at least 12.5% of 1990 levels by 2012	Higher than national or regional averages			Oxfordshire Data Observatory: CO2 emissions
Properties at risk from flooding	5491 properties in Oxford	310,000	2 million				M & W development must not exacerbate flood risk in Oxon.	www.environment-agency.gov.uk
Air Quality								
Number of designated AQMAs	Seven		223 local authorities have declared at least 1 AQMA		Increasing: 2006 there were 4		Each district carries out monitoring and is required to identify an AQMA if air quality falls below a certain level.	www.oxfordshire.gov.uk
Transport								

Bus journeys undertaken in Oxfordshire	Increased by 3.7% between 2005/2006 and 2006/2007			DoT target 12% increase in bus journeys nationally			An increase in the number of people travelling by bus potentially reduces road congestion and air pollution from traffic.	Oxfordshire Data Observatory
Traffic on non-motorway roads	Between 1996 and 2006, traffic increased by 12,5%		Traffic levels increased by 1.3% between 2001 and 2002	Govt hopes to approach zero growth in traffic by 2010	Local trends are in line with national trends, showing a steady increase.			National statistics transport statistics bulletin, Oxon data Observatory
Minerals								
Sub-regional apportionment of sand and gravel	1.82mt per year	420mt 1996-2006					Could increase under sub-regional SEERA review of apportionment methodology	Oxfordshire Minerals and Waste Local Plan 1996
Use of secondary and recycled aggregates					No local data-nationally increasing figures		Data gap: difficulty in obtaining data from operators	
Land bank. Regional apportionment sand and gravel					The land bank is currently 2.5 years for sand and gravel		MWDF needs to identify adequate number of sites to meet national guideline of 7 years landbank	

Sand and gravel sales	1,059, 195 tonnes				1,288,591 tonnes		Sales are slowly decreasing: MWDF needs to identify sites to meet sub-regional apportionment	Annual Monitoring Survey returns, 2005, 2007
Sand and gravel reserves	5,789,727						Plentiful reserves identified	Annual Monitoring Survey returns, 2007, BGS data
Waste								
Waste produced	2m tonnes							
Amount of MSW landfilled (tonnes)	210,000 (2008)	4.5m tonnes produced: 76% went to landfill		56,700 tonnes by 2019/2020(EU Landfill Directive 1999)			Amount of waste going to landfill needs to decrease significantly to avoid fines under landfill tax. MWDF needs to identify potential for alternative technologies to dispose of waste.	Oxfordshire Waste Partnership. Environment Agency
Recycled	38.6% household waste recycled 2006-07.			Recycle or compost at least 55% household waste by 2020	Gradual increase of amount of household waste recycled			Oxfordshire Waste Strategy 2000, Oxfordshire Data Observatory
Composted								
Land and resources								

Loss of Grade I and Grade II agric land	1,328 ha Grade 1 (0.5%). 51,021 ha Grade II (19.6%)		Grade 1:2.7%, Grade II: 14.2%		Data gap		Not known	http://www.defra.gov.uk/rds/lgmt/docs/ALC-Stats071105.pdf
Average house price	£289,130	£264,906	£219,262		Change in last year: +4.4%. Change in last quarter: -0.3%		Affordability a problem for first time buyers.	http://news.bbc.co.uk/1/shared/spl/hi/in_depth/uk_house_prices
Number of new developments on brownfield sites	1999-2004: 52%		67%	UK target: 60% by 2008	Slowly increasing			Oxfordshire Data Observatory
Economy								
Value of tourism								
Employment growth	3.3% 1998-2005		8% 1998-2005		Increasing but more slowly than adjoining counties			Oxon quarterly economic update, OEO

6 Next Steps

6.1 Commenting on the Sustainability Appraisal

In order to take account of the views of the community and other stakeholders there will be a period of formal consultation on the Preferred Minerals Core Strategy DPD. The Sustainability Appraisal can be read alongside the Minerals DPD document to inform consultation responses and comments can be made on the Sustainability Appraisal Report.

If consultation gives rise to significant changes that have not already been subject to Sustainability Appraisal, the Council will then be required to undertake an appraisal of these changes before the plan can be published for submission.

7 APPENDIX A: ASSESSMENT OF SIGNIFICANT EFFECTS

The following table provides an explanation to the symbols used in the appraisal.

Symbol	Likely effect on the SA Objective
++	The option is likely to have a **very positive** impact
+	The option is likely to have a **positive** impact
0	**No significant effect / no clear link**
?	**Uncertain** or **insufficient information** on which to determine impact
-	The option is likely to have a **negative** impact
- -	The option is likely to have a **very negative** impact
+/-	The option is likely to have some positive and some negative effect

7.1 Vision

Vision –

a) In the period to 2030, the supply of aggregate materials to meet the development needs of Oxfordshire and help sustain its world class economy will be met by:

- an increased use of secondary and recycled aggregate materials;
- a reduced proportion of locally produced sand and gravel, soft sand, limestone and ironstone; and
- the continued import of materials such as hard crushed rock that are not available locally.

b) Mineral working will be located and managed to minimise:

- the distance that aggregates are transported by road;
- the use of unsuitable roads through settlements; and
- other harmful impacts of mineral extraction and transportation on Oxfordshire's environment and communities.

c) The restoration of mineral workings will enhance the quality of Oxfordshire's natural environment and the quality of life for Oxfordshire residents by:

- contributing to the creation of habitats and protection of biodiversity, particularly in relation to the Conservation Target Areas; and
- providing access to the countryside and opportunities for recreation.

Sustainability Appraisal objectives	**Option 1**	**Comments**
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	++	The vision recognises the importance of the ecological values present in the county and explicitly recognises the purpose/objectives of the Conservation Target Areas which are identified in the sub-criteria of this SA objective.

2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	+	The restoration aims in Part C of the vision directly address this SA objective.
3. To maintain and improve ground and surface water quality	+	The restoration aims in Part C of the vision directly address this SA objective.
4. To improve and maintain air quality to levels which do not damage natural systems	++	The restoration aims in Part C of the vision address this SA objective, as does the aim to reduce transportation of aggregates by road.
5. To reduce greenhouse gas emissions to reduce the cause of climate change	+	The aim to reduce transportation of aggregates by road and increased use of secondary and recycled aggregates address this SA objective, although the vision relies on some imported primary materials which will still require transportation into the county.
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	0	There is no direct reference in the vision to the issues of flood risk or climate change although restoration proposals may result in reduced risk in some areas. It is recognised that flood risk is not a major issue for minerals as it is taken to be compatible development, although the policies that implement this vision should generally address the issues of climate mitigation and adaptation.
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	+	The aim to reduce transportation of aggregates by road and to minimise the use of unsuitable roads through settlements is positive in relation to this SA objective.
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	++	The vision clearly aims to enhance quality of life for Oxfordshire's residents through restoration, improved access to the countryside, opportunities for recreation and minimisation of impacts on settlement roads through transportation of minerals.
9. To protect, improve and where necessary restore land and soil quality	++	The restoration of mineral workings and creation of habitats should have a positive impact on land and soil quality and thus this SA objective.
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	+	The increased use of secondary and recycled aggregates will move management of this material up the waste hierarchy and is thus positively consistent with this SA objective.

11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	++	The vision aims to meet the development needs of Oxfordshire through a sustainable and balanced approach including some local provision, increased use of secondary or recycled aggregate materials and the continued import of those materials necessary, but not available locally, e.g. hard crushed rock.
12. To support Oxfordshire's economic growth and reduce disparities across the county.	+	The vision identifies that supply will meet the development needs and help to sustain its world class economy. It doesn't address reduction of disparities, but this is difficult to achieve due to the fact that minerals are worked where they are won.

Summary

The proposed vision addresses all of the sustainability objectives with the exception of SA Objective 6 on climate mitigation and adaptation. Additional text to address climate change issues should be considered. The proposed vision as worded would generate positive or very positive impacts in relation to all of the identified sustainability objectives, with the exception of Objective 6 (as noted above).

7.2 Objectives

The following table provides an explanation to the symbols used in the compatibility appraisal of the proposed Minerals LDF Objectives and the Sustainability Appraisal Objective.

Symbol	Likely effect on the Sustainability Objective
+	Objective compatible
0	Objectives not related
-	Objectives incompatible
?	The objective relationship is unknown or is dependent on implementation

SA Objectives / **Proposed Waste LDF Objectives**	**SA1. Biodiversity and Geodiversity**	**SA2. Landscape and Historic built heritage**	**SA3. Ground and Surface water quality**	**SA4. Air Quality**	**SA5. Green house gas emissions**	**SA6.Flooding and Climate change adaptation**	**SA7. Transport**	**SA8. Human Health and Local Amenity**	**SA9. Land and Soil Quality**	**SA10. Waste Hierarchy**	**SA11. Waste and minerals management**	**SA12. Economic Growth**
OBJECTIVE i	?	?	?	?	?	?	?	?	?	?	+	+
OBJECTIVE ii	?	+	?	?	+	0	+	?	?	0	+	+
OBJECTIVE iii	0	0	0	0	0	0	+	0	0	0	+	+
OBJECTIVE iv	+	+	+	+	+	+	+	+	+	+	+	+

SA Objectives / Proposed Waste LDF Objectives	SA1. Biodiversity and Geodiversity	SA2. Landscape and Historic built heritage	SA3. Ground and Surface water quality	SA4. Air Quality	SA5. Green house gas emissions	SA6.Flooding and Climate change adaptation	SA7. Transport	SA8. Human Health and Local Amenity	SA9. Land and Soil Quality	SA10. Waste Hierarchy	SA11. Waste and minerals management	SA12. Economic Growth
OBJECTIVE v	?	?	+	+	+	+	+	+	?	0	0	+
OBJECTIVE vi	+	+	?	+	+	+	+	+	?	0	0	+
OBJECTIVE vii	+	+	+	+	?	?	0	+	+	0	0	+
OBJECTIVE viii	+	+	+	+	+	+	0	+	+	0	0	0
OBJECTIVE ix	?	?	?	?	?	?	?	?	?	0	+	+
OBJECTIVE x	?	?	?	+	+	+	+	+	0	+	+	+

Overall, the proposed objectives were found to be compatible with the SA objectives. No incompatibility was found between the SA objectives and the Minerals LDF objectives. The Minerals LDF objectives seek to manage Oxfordshire's mineral planning needs in a way that protects the valued natural environment (objectives iv, vi, vii and viii), contributes to economic growth (objectives I, iii, iv, and ix) as well as ensuring communities are provided with adequate facilities to meet anticipated needs in a manner that protects their health and safety (objectives vi, viii, ix, and x). Objectives v and vi supports reducing the need to transport minerals significant distances by road and this is further supported by Objective x. Together these objectives have the potential to reduce the negative impacts associated with HGV movements in specific areas of the County including: addressing the serious congestion on the County's roads, lowering the high level of GHG emissions per capita (currently above both UK and South East averages), reducing air and noise pollution and other local amenity impacts experienced by local communities in mineral working areas.

7.3 Strategic policies

Symbol	Likely effect on the SA Objective
++	The option is likely to have a **very positive** impact
+	The option is likely to have a **positive** impact
0	**No significant effect / no clear link**
?	**Uncertain** or **insufficient information** on which to determine impact
-	The option is likely to have a **negative** impact
- -	The option is likely to have a **very negative** impact
+/-	The option is likely to have some positive and some negative effect

Policy M1: Provision for Secondary and Recycled Aggregates

The production and supply of secondary and recycled aggregates, in place of land won aggregates, will be encouraged.

Provision will be made for facilities to enable the supply of at least 0.9 million tonnes of secondary and recycled aggregates a year, comprising:

- **Permanent facilities; and**
- **Temporary facilities at aggregate quarries and inert waste landfill sites.**

Provision will be primarily through recycling of construction, demolition and excavation waste but also through recycling of road planings and rail ballast and recovery of ash from combustion processes.

Sustainability Appraisal objectives	Option 1	Comments
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	?	Use of secondary and recycled aggregates to replace land won aggregates should have a positive impact on protection of Oxfordshire's geodiversity over the longer term and potentially a long term positive effect in relation to protecting/maintaining biodiversity and habitats in those areas where primary minerals would otherwise be won. The facilities for processing of such aggregates tend to be located in existing quarries/landfills, and so would not compromise any new areas. However the production of secondary/recycled aggregates is recognised as having environmental effects broadly similar to those caused by processing of primary aggregates so in the short and at least temporary term, adverse effects on natural habitats and species could be experienced unless appropriately mitigated. The nature of any adverse impacts will depend to some extent on the allocation of sites for secondary and recycled aggregates through the Sites Allocations DPD and the application of the Common Core Policies to any individual applications for production of secondary/

		recycled aggregates, including the location of such facilities in relation to sensitive receptors. Where these facilities exist in close proximity to active mineral workings there are likely to be temporary but sustained negative cumulative effects without appropriate mitigation. The adverse effects arising from mobile units which serve individual developments are likely to be of a much more temporary and local nature than those facilities holding long term consents. Restoration schemes for those sites which are no longer required should be required to address biodiversity and habitat creation objectives consistent with Policy M6 and a cross reference to this policy in the supporting text would improve the sustainability of this policy in relation to this SA Objective.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	?	Use of secondary and recycled aggregates to replace land won aggregates have potential for long term minor positive impacts on protection of Oxfordshire's landscape character and historic/built heritage in that facilities for processing of such aggregates tend to be located in existing quarries/landfills, and so would not compromise any new areas. Production of secondary/recycled aggregates is recognised as having environmental effects broadly similar to those caused by processing of primary aggregates so in the short and at least temporary term, adverse effects on natural habitats and species could be experienced without appropriate mitigation. The nature of any adverse impacts will depend to some extent on the allocation of sites for secondary and recycled aggregates through the Sites Allocations DPD and the application of the Common Core Policies to any individual applications for production of secondary/ recycled aggregates, including the location of such facilities in relation to sensitive receptors. Where these facilities exist in close proximity to active mineral workings there are likely to be temporary but sustained negative cumulative effects without appropriate mitigation. The adverse effects arising from mobile units which serve individual developments are likely to be of a much more temporary and local nature than those facilities holding long term consents. Restoration schemes for those sites which are no longer required should assist with reinstatement of an appropriate landscape or protection of geodiversity consistent with Policy M6 and a cross reference to this policy in the supporting text would improve the sustainability of this policy in relation to this SA Objective.

3. To maintain and improve ground and surface water quality	?	The nature of any adverse impacts will depend to some extent on the allocation of sites for secondary and recycled aggregates through the Sites Allocations DPD and the application of the Common Core Policies to any individual applications for production of secondary/ recycled aggregates, including the location of such facilities in relation to sensitive receptors. Where these facilities exist in close proximity to active mineral workings there are likely to be temporary but sustained negative cumulative effects without appropriate mitigation. The adverse effects arising from mobile units which serve individual developments are likely to be of a much more temporary and local nature than those facilities holding long term consents.
4. To improve and maintain air quality to levels which do not damage natural systems	?	The nature of any adverse impacts will depend to some extent on the allocation of sites for secondary and recycled aggregates through the Sites Allocations DPD and the application of the Common Core Policies to any individual applications for production of secondary/ recycled aggregates, including the location of such facilities in relation to sensitive receptors. Where these facilities exist in close proximity to active mineral workings there are likely to be temporary but sustained negative cumulative effects without appropriate mitigation. The adverse effects arising from mobile units which serve individual developments are likely to be of a much more temporary and local nature than those facilities holding long term consents. Mobile units also provide a means to reduce the distance that aggregates are transported, which could have a positive impact on air quality in relation to transport related emissions.
5. To reduce greenhouse gas emissions to reduce the cause of climate change	++	The nature of any adverse impacts will depend to some extent on the allocation of sites for secondary and recycled aggregates through the Sites Allocations DPD and the application of the Common Core Policies to any individual applications for production of secondary/ recycled aggregates, including the location of such facilities in relation to the markets that they serve. Temporary mobile units have the advantage of locating close to the source/end point, reducing transportation distances and subsequently reducing GHG emissions.
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	+	The nature of any adverse impacts will depend to some extent on the allocation of sites for secondary and recycled aggregates through the Sites Allocations DPD and the application of the Common Core Policies to any individual applications for production of secondary/ recycled aggregates and in particular the planned location of such facilities – i.e. whether they are located in areas of flood risk. Restoration schemes for those sites which are no longer required should assist with flood attenuation where appropriate. A reference to Policy M6 (and inclusion of flood attenuation objectives in Policy M6) would improve sustainability of this policy in relation to this SA objective.

7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	?	The nature of any adverse impacts will depend to some extent on the allocation of sites for secondary and recycled aggregates through the Sites Allocations DPD and the application of the Common Core Policies to any individual applications for production of secondary/recycled aggregates and in particular the planned location of such facilities in relation to the markets/end use sites. Where these facilities exist in close proximity to active mineral workings there are likely to be negative temporary but sustained cumulative effects without appropriate mitigation. Many of the active temporary and permanent secondary and recycle aggregates facilities are located at existing quarries and landfill sites so effects on the local road network are likely to be similar as for primary aggregates, depending on the volumes of material moved and potential for backfilling. Temporary mobile units have the advantage of locating close to the source/end point, reducing transportation distances and subsequently impacts on the strategic road network.
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	?	The nature of any adverse impacts will depend to some extent on the allocation of sites for secondary and recycled aggregates through the Sites Allocations DPD and the application of the Common Core Policies to any individual applications for production of secondary/recycled aggregates and in particular the planned location of such facilities in relation to local communities. Many of the active temporary and permanent secondary and recycled aggregates facilities are located at existing quarries and landfill sites so adverse effects on the local communities are likely to be similar to the winning of primary aggregates, depending on the volumes of material moved and potential for backfilling. Temporary mobile units have the advantage of locating close to the source/end point, reducing transportation distances and subsequently impacts on local communities.
9. To protect, improve and where necessary restore land and soil quality	++	The nature of any adverse impacts will depend to some extent on the allocation of sites for secondary and recycled aggregates through the Sites Allocations DPD and the application of the Common Core Policies to any individual applications for production of secondary/recycled aggregates. The promotion of secondary and recycled aggregates to replace land won aggregates should have a positive impact on protection of high grade agricultural land and soil quality, as it minimises land take – sites are usually operated from existing quarries/landfills.
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	++	The policy encourages use of secondary and recycled aggregates which might otherwise be disposed of to landfill, so is very positive in relation to this SA objective.

11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	+	The policy makes a sustainable contribution to Oxfordshire's sub-regional minerals apportionment based on a local assessment of supply and is consistent with the South East Plan target (Policy M2 – 0.9 million tonnes per year). The anticipated production varies from 400,000 to 550,000 with a level of uncertainty yet to be verified. Further capacity and production are anticipated from mobile plant (approx 25%) but this target is ambitious as rates of utilisation are already high and secondary and recycled aggregates are not currently substituted for primary aggregates in structural uses, only in lower specification construction uses like car parks.
12. To support Oxfordshire's economic growth and reduce disparities across the county.	+	The apportionment will support Oxfordshire's economic growth over the long term and in particular growth of the local economy. Recycling facilities tend to be located at existing quarries and landfills, thus continuing to support local jobs and businesses. A reliance on imported material would not support local business.

Summary

Policy M1 seeks to make a sustainable contribution to Oxfordshire's sub-regional minerals apportionment for secondary and recycled aggregates based on a local assessment of supply[15] and consistent with the South East Plan target (Policy M2 – 0.9 million tonnes per year). The anticipated production varies from 400,000 to 550,000 with a level of uncertainty yet to be verified[16]. Further capacity and production are anticipated from mobile plant (approx 25%[17]) but this target is recognised as ambitious as rates of utilisation are already high and secondary and recycled aggregates are not currently substituted for primary aggregates in structural uses, only in lower specification construction uses like car parks.

Production of secondary/recycled aggregates is recognised as having environmental effects broadly similar to those caused by processing of primary aggregates. The nature of any adverse impacts will depend to some extent on the exact location of sites for secondary and recycled aggregates allocated through the Sites Allocations DPD and the application of the Common Core Policies to any individual applications for production of secondary/recycled aggregates, including the proximity of such facilities in relation to sensitive receptors. Where these facilities exist in close proximity to active mineral workings there are likely to be negative cumulative effects of a temporary but sustained nature. The adverse effects arising from the operation of temporary mobile units associated with individual developments are likely to be of a much more temporary and local nature than facilities which hold long term consents.

Restoration schemes for those secondary/recycling sites which are no longer required will be required to address biodiversity, landscape, water and soil restoration objectives. A cross reference to Policy M: Restoration of Mineral Workings in the supporting text to this policy is therefore suggested, as it would improve the sustainability of this policy in relation to a number of the SA objectives.

The apportionment will support Oxfordshire's economic growth over the long term and in particular growth of the local economy, as recycling facilities tend to be located at existing quarries and landfills, thus continuing to support local jobs and businesses.

[15] Local Assessment of Aggregates Supply Requirements Final Report January 2011 Prepared for Oxfordshire County Council by Atkins Ltd
[16] Ibid
[17] Ibid

Policy M2: Provision to be made for Mineral Working

Permission will be granted for mineral working to enable landbanks of reserves with planning permission to be maintained of at least 7 years for soft sand and sharp sand and gravel and 10 years for crushed rock, based on the following rates of extraction:

- **Sharp sand and gravel – 1.01 million tonnes a year;**
- **Soft sand 0.25 – million tonnes a year; and**
- **Crushed rock – 0.63 million tonnes a year.**

Sustainability Appraisal objectives	Option 1	Comments
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	+	Effects cannot be judged on the apportionment figure alone, these depend on the location and distribution of mineral working sites which make up the apportionment – as appraised in Policy M3. However it can be expected that the long term environmental effects of such an apportionment level might be less adverse than under the current policy - Policy M3 of the South East Plan, which requires a higher level of provision or the Secretary of State's proposed changes to Policy M3, which require an even higher level of supply.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	+	As above
3. To maintain and improve ground and surface water quality	+	As above
4. To improve and maintain air quality to levels which do not damage natural systems	+	As above
5. To reduce greenhouse gas emissions to reduce the cause of climate change	+	As above
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	+	As above

7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	+	As above
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	+	Effects cannot be judged on the apportionment figure alone, these depend on the location and distribution of mineral working sites which make up the apportionment – as appraised in Policy M3. However it can be expected that the long term environmental and local amenity effects of such an apportionment level might be less adverse than under the current policy - Policy M3 of the South East Plan, which requires a higher level of provision or the Secretary of State's proposed changes to Policy M3, which require an even higher level of supply.
9. To protect, improve and where necessary restore land and soil quality	+	As above
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	0	
11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	++	The policy makes a sustainable contribution to Oxfordshire's sub-regional minerals apportionment based on a local assessment of supply prepared by Atkins (January 2011) which suggests that the Secretary of State's proposed changes to policy M3 are too high.
12. To support Oxfordshire's economic growth and reduce disparities across the county.	+	The policy makes provision for aggregate supply to support the expected economic growth, based on an assessment of future aggregate demand by consultants Atkins (January 2011).

Summary

The adverse effects which might arise from a particular volume of mineral working in the County are difficult to predict based on the apportionment figure alone, as it is the spatial implications, i.e. the location and distribution of mineral working sites which make up the apportionment which will determine the effects. The proposed spatial distribution of this apportionment is appraised through Policy M3. However it can be expected that the adverse environmental and social effects of the proposed apportionment level might be less adverse than those experienced under the delivery of the current policy - Policy M3 of the South East Plan, which requires a higher level of provision or the Secretary of State's proposed changes to Policy M3, which would require an even higher level of supply. The policy makes provision for aggregate supply to support the expected economic growth, based on a local assessment of future aggregate demand by consultants Atkins (January 2011[18]).

[18] Local Assessment of Aggregates Supply Requirements Final Report January 2011 Prepared for Oxfordshire County Council by Atkins Ltd

Policy M3: Strategy for the Location of Mineral Working

The principal locations for sharp sand and gravel working, as shown in figure 7, will be at:
i. existing areas of working at:

- **Lower Windrush Valley;**
- **Eynsham / Cassington / Yarnton;**
- **Sutton Courtenay; and**
- **Caversham;**

through extensions to existing quarries or new quarries to replace exhausted quarries; and
ii. a new area of working at Cholsey, to replace Sutton Courtenay when reserves there become exhausted;
Permission for further working within the Lower Windrush Valley and Eynsham / Cassington / Yarnton areas will not be permitted if it would lead to an increase in the overall level of mineral extraction or mineral lorry traffic above past levels within these areas combined.

The principal locations for soft sand working, as shown in figure 7, will be:

- **East and south east of Faringdon;**
- **North & South of the A420 to the west of Abingdon**
- **Duns Tew.**

The principal locations for crushed rock working, as shown in figure 7, will be:

- **North of Bicester to the east of the River Cherwell;**
- **South of the A40 near Burford; and**
- **East and south east of Faringdon.**

Preference will be given to extensions to existing soft sand and crushed rock quarries. New quarries will only be permitted if sufficient provision cannot be made through extensions.

Additional working of ironstone for aggregate use will only be permitted in exchange for revocation, without compensation, of an existing permission containing workable resources.

The working of clay will normally be permitted only from areas where sand and gravel is being worked in the following locations:
• Lower Windrush Valley;
• Eynsham/Cassington/Yarnton; and
• Sutton Courtenay.

Planning permission will not be granted for mineral working outside the locations identified above unless the required provision cannot be met from within these areas.

Applications to work fullers earth, oil, gas, coal or any other minerals not currently worked in the county will be considered in the light of national and development plan policies.

Permission will be granted for extensions to existing quarries and new quarries for extraction of building stone where a local need for the material has been demonstrated and provided that the quarrying is at a scale appropriate to the locality and will not harm the environment or local amenity.

Sustainability Appraisal objectives	Option 1	Comments

1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	+/-	**Sharp sand and gravel:** Although the proposed areas for sharp sand and gravel extraction are generally well located in terms of their proximity to important nature conservation sites, some areas within Eynsham/Cassington/Yarnton and the Lower Windrush Valley (LWV) are close to important nature conservation designations (SSSIs, SAC). These designations could constrain working in some sites within these areas. The HRA Screening Report has concluded that it would be possible to deliver the required amount of sand and gravel from this area from nominated sites which are not likely to impact on Oxford Meadows SAC but that some sites could have an impact on the hydrology of the Cothill Fen SAC, which would require further investigation. Where there is potential for adverse effects due to proximity to nature conservation sites, mitigation measures should be put in place to protect these areas. The LWV lies within the Conservation Target Areas (CTAs) identified by the Oxfordshire Nature Conservation Forum[19] . The main aim within CTAs is to restore biodiversity at a landscape-scale through maintenance, restoration and creation of BAP priority habitats. Further working in this area would therefore contribute positively to the planned restoration and habitat creation at a large-scale, which combined with existing restoration plans, would have significant beneficial cumulative effects for the local community and wildlife. However, these benefits would be in the long-term as mineral works are likely to take years before the restoration plans are implemented and short term adverse effects are more likely during the period of active working. **Soft sand:** There are SSSIs close to all the identified areas for soft sand extraction. The Tubney/Marcham/Hinton Waldrist area is also close to Cothill Fen SAC. The HRA Screening Report concluding that working soft sand sites in this area is unlikely to have an impact on this SAC as it is possible to put in place buffer zones and to work above the water table to avoid hydrological impacts. The presence of SSSIs will affect the extent of the area that can be worked. Mitigation measures will be required where working is close to designated areas to ensure there are no adverse effects on them. Restoration of sites has the potential to result in creation of new habitats which would be a long term positive effect. **Crushed rock:** The area north of Bicester (Ardley) is constrained by the presence of SSSIs. Proximity to these sites may affect the extent of areas that can be worked and mitigation measures may be required to ensure there are no adverse effects on them. Restoration has potential to create opportunities for biodiversity which would be a long term positive effect.

[19] http://www.oncf.org.uk/biodiversity/cta.html

2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	+/-	**Sharp sand and gravel:** There are no national landscape designations in any of the areas proposed for sharp and gravel extraction, although Cholsey is adjacent to the AONB. The extent of actual areas available for working in Cholsey would be constrained by this designation. However, increased working in the identified areas has potential for negative cumulative landscape and visual effects for the local communities living nearby. Measures to mitigate against negative effects on the already extensively modified landscapes should be required at site selection and planning application stages. There is potential for negative impacts in LWV and Sutton Courtenay due to the presence of Scheduled Ancient Monuments. Mineral working can lead to damage to archaeological features and so sites should be well sited away from these and where they are in close proximity, mitigation measures against adverse effects should be in place (where applicable) before extraction of materials. **Soft Sand:** None of the identified sites for soft sand extract lie within the AONB. However, mineral working has potential for adverse visual and landscape effects, and mitigation measures should be in place where sensitive receptors like housing may be affected, leading to adverse visual effects. There are Scheduled Ancient Monuments close to the Tubney/Marcham/Hinton Waldrist area for soft sand extraction. Working in this area would need to take account of the presence of the monuments and protect them accordingly. **Crushed rock:** There are no strategic landscape designations in any of the areas identified for crushed rock. None of the areas identified are within the AONB. However, there is potential for local landscape and visual impacts depending on the location of sites relative to sensitive receptors. There are Scheduled Ancient Monuments within the area north of Bicester. Mitigation measures against adverse effects on these monuments as well as on local visual and landscape effects may be required prior to extraction of materials to avoid adverse effects.

3. To maintain and improve ground and surface water quality	+/-	**Sharp sand and gravel:** There is potential for negative impacts on ground water in LWV, Eynsham/Cassington/Yarnton (ECY) and Caversham from sharp sand and gravel extraction due to the presence of underlying aquifers. There is also potential for negative impacts on the surface water quality of rivers Windrush (LWV), River Evenlode (ECY) and River Thames (Caversham, Sutton Courtenay - up to 2020 and Cholsey post 2020) from sharp sand and gravel extraction in these areas. There is potential for cumulative negative effects on ground water flow as a result of concentration of mineral workings within one area and in particular in the LWV and Cassington area. **Soft sand:** Most soft sand working takes place above the water table and therefore minimal adverse impacts on ground water flows are expected. **Crushed rock:** Impacts on ground water would need to be tested at the planning application stage.
4. To improve and maintain air quality to levels which do not damage natural systems	-	There is potential for air pollution associated with HGV movements in all the identified areas for working over the lifetime of the working permissions and into the restoration period. However as rate of production should not exceed the current permitted rates, there should be no additional short term adverse impacts in those areas which are existing working areas. **Sharp sand and gravel:** As resources at Sutton Courtenay are exhausted and working moves to Cholsey, it is expected that adverse effects will shift as well. Sand and gravel extraction in the Cholsey area will provide a continued local source of aggregates in the south of the county, which is well located to meet the likely need from planned development at Didcot and Wantage & Grove and reduce distances travelled to these markets. **Soft sand:** Working in the south west areas identified is unlikely to lead to significant increases in HGV traffic as these areas are based around existing working areas, and preference would be on extensions to existing quarries to make the most efficient use of plant and infrastructure. **Crushed rock:** As the identified areas for crushed rock are based around existing limestone working areas, if working continues at the current level, it is expected that there would be no increase in adverse effects on air quality as traffic levels would be the same as current and preference would be on

		extensions to existing quarries, to make the most efficient use of plant and infrastructure.
5. To reduce greenhouse gas emissions to reduce the cause of climate change	-	GHG emissions are expected in all the areas due to transportation of materials by road. However the strategy should not lead to significant increases in GHG emissions as the increase in HGV vehicles is not expected to be high and the emphasis is predominantly on extensions rather than new sites, at least in the short term. Sand and gravel extraction in the Cholsey area will provide a continued local source of aggregates in the south of the county, which is well located to meet the likely need from planned development at Didcot and Wantage & Grove and reduce distances travelled to these markets.
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	0	**Sharp sand and gravel:** Some parts of the proposed production area for sharp sand and gravel lie within high flood risk zones (LWV, ECY, Caversham and Sutton Courtenay). The Environment Agency (EA) requires that development should be avoided in the floodplain where possible and would require the sequential and (where appropriate), the exception tests as required through Planning Policy Statement 25 (PPS25).However, sand and gravel extraction is considered to be compatible development. Supporting infrastructure would however be at risk from flooding and should be located away from the high risk areas. **Soft sand:** Most soft sand working areas lie outside flood risk zones 2 and 3. Where there is potential for flooding (e.g. small area in Hatfrod/Shellingford lies within flood risk zone 3), mitigation measures including the sequential test will be required before site allocation of supporting infrastructure. **Crushed rock:** None of the proposed areas lie within areas of high flood risk.
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	-	Continued working in the existing areas will result in cumulative effects over time on the local communities including on landscape and local amenity – noise, air, dust and traffic impacts. However, mitigation measures at the planning application stage can help reduce such impacts. It is also envisaged that there will be no significant increase in working in any one particular area and so no significant adverse cumulative effects are expected in any of these areas. **Sharp sand and gravel:** There is potential for adverse, temporary but long term transport impacts associated with sharp sand and gravel working on the A40 (LWV, ECY), A 44 (ECY), A4155/B478 (Caversham) and B4016/A4130 (Sutton

		Courtenay – up to 2020). Post 2020, there is potential for negative transport impacts along the A4130 and A4074 associated with working in Cholsey. **Soft sand:** It is not envisaged that soft sand working in any of the identified areas would lead to significant increases in HGV traffic. However, there is potential for some adverse impacts from increased traffic on the local roads including on the B4030/A260 (Duns Tew) and on the A420, A417, and B4508 (south east Faringdon and the Tubney/Marcham/Honton Walrdist area). Further assessment on access and suitability of roads to accommodate more HGV traffic is recommended at the site selection stage. **Crushed rock:** If working continues at the current level (identified areas are existing limestone working areas), transport impacts will remain as current. However, increased working in any one particular area has potential for negative cumulative effects on the road network and communities near the area. Careful consideration should be given to access and road capacities when considering sites for further working.
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	?/-	All but one of the proposed working areas are existing minerals working areas, the exception is Cholsey (sand and gravel). In this respect, while there will be no significant adverse effects of such workings on new communities (with the exception of the Cholsey area), those communities that are currently adversely affected by mineral workings are expected to continue to experience some effects for the long term, although once sites are fully worked out and restored, positive permanent effects are expected. The degree and nature of impacts is dependent on mitigation measures put in place, proximity to sensitive receptors and the duration of working.
9. To protect, improve and where necessary restore land and soil quality	+	LWV and ECY offer opportunities for landscape wide restoration schemes. There are extensive Conservation Target Areas within the Lower Windrush Valley and there is extensive scope for restoration on a landscape scale, which would also contribute to national Biodiversity Action Plan targets. Other areas have potential for beneficial restoration impacts depending on the preferred land uses. Restoration of sites is likely to lead to improved land and soil quality.
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	0	

11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	++	The policy makes a sustainable contribution to Oxfordshire's sub-regional minerals apportionment by allocating sites in existing minerals working areas predominantly, which can take advantage of existing infrastructure and employment, and which are located in reasonable proximity to the markets. To safeguard these communities from additional cumulative impacts the policy does not permit an increase in the overall level of extraction or mineral lorry traffic above past levels within these areas combined.
12. To support Oxfordshire's economic growth and reduce disparities across the county.	+	**Sharp sand and gravel:** All the areas for sharp sand and gravel extraction are well located close to the markets and provide potential for investment and job creation which supports the local economy and has a long term positive impact. **Soft sand:** Working in the identified areas for soft sand extraction provides some positive economic benefits and allows for use of existing infrastructure and networks. This policy also allows the current pattern of extraction of two different quality sands to be continued which has a positive economic benefit.

Summary

Soft sand and gravel:
Seeking to concentrate extraction in areas where working is currently taking place or has taken place recently has the economic advantages of using existing infrastructure as well as labour force. It also presents opportunities for co-ordinated large-scale restoration projects which would in the longer term lead to beneficial effects for the local communities (through recreation and leisure opportunities) as well as for wildlife. However, there is still potential for cumulative negative effects in the short to medium term on the local communities especially with regard to traffic and amenity issues unless appropriately mitigated. Potential adverse effects on nature conservation objectives and in particular designated European Sites will need to be addressed at the Site Allocation stage, and potentially at the individual application stage, in particular the potential impacts on the hydrology of Oxford Meadows and Cothill Fen SACs. Measures to mitigate against negative effects on the already extensively modified landscapes should be required at site selection and planning application stages.

Soft sand:
Identifying two areas of working in the south of the county and one in the north of the county will help minimise traffic impacts as well as spread the effects of soft sand working more equitably. However, there will be some cumulative effects on communities living close to existing sites and careful consideration should be given when identifying sites and allowing further extraction so as to minimise the overall effects of continued working in these areas. The two areas in the south west of the county have different quality sands and the policy appropriately allows for the working of the two types of sand. Continuing with the existing pattern provides certainty to industry and also takes advantage of existing infrastructure. Potential adverse effects on nature conservation objectives and in particular designated European Sites will need to be addressed at the Site Allocation and/or individual planning application stage.

Crushed rock:
The revised crushed rock policy would lead to a distribution of effects of crushed rock working in the county therefore potentially preventing adverse effects on a single locality. This policy takes advantage of existing infrastructure as well as continuing to provide local employment. This has positive economic benefits. In the long term, there is potential for adverse cumulative effects on the communities living near the identified areas. Careful consideration should be given to the

exact location of sites and works, relative to housing and other sensitive receptors to mitigate against potential additional adverse effects to those already experienced.

Where there is potential for adverse effects due to proximity to nature conservation sites, mitigation measures should be put in place to protect these areas.

Cumulative effects:

Sharp sand and gravel:
Due to continued working in LWV, ECY and Caversham there is potential for long-term adverse cumulative effects on the environment and on the local communities from sharp sand and gravel working. These include ecological, visual and local landscape impacts, air and noise pollution from HGV movements, traffic congestion, GHG emissions and impacts on the water environment. In Sutton Courtenay, cumulative effects would be felt in the short-medium term (to 2020) after which production is planned to cease in this area. Cholsey is then expected to experience similar impacts, although these should be addressed through the Site Allocations DPD process and individual applications.

Appropriately, the policy will not lead to an overall increase of working activity in west Oxfordshire, or of the attendant cumulative impacts in this area where there has already been extensive working.

Soft sand:
In the long-term, there is potential for cumulative adverse effects on the environment and local communities due to soft sand extraction although these are not envisaged to be significant due to the small quantities of soft sand which will be produced.

Crushed rock:
Continued working in the existing areas has potential for adverse cumulative effects over time on the local communities including on landscape and local amenity – noise, air, dust and traffic impacts. Mitigation measures at the planning application stage can help reduce such impacts. It is also envisaged that there will be no significant increase in working in any one particular area and so no significant additional adverse cumulative effects are expected on top of those already experienced.

Policy M4: Aggregates rail depots

Existing and permitted rail depots will be safeguarded for importing aggregates at:

- **Banbury (Hennef Way);**
- **Kidlington;**
- **Sutton Courtenay (Appleford Sidings); and**
- **Shipton on Cherwell Quarry.**

Where proposals for development would result in the loss of a rail depot site, a suitable alternative site should be provided.

The development of further aggregates rail depots will be encouraged at suitable locations outside the Green Belt.

Sustainability Appraisal objectives	Option 1	Comments
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	0	This policy safeguards the movement of imported aggregates via rail transport and encourages further development of rail infrastructure. This may have more positive long term impacts on biodiversity than transportation by road.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	0	This policy safeguards the movement of imported aggregates via rail transport and encourages further development of rail infrastructure. This may have more positive long term impacts on local landscape character than transportation by road.
3. To maintain and improve ground and surface water quality	+	This policy safeguards the movement of imported aggregates via rail transport and encourages further development of rail infrastructure. This approach should have a minor positive impact on surface water quality as a result of reduced pollution from runoff from roads arising from transportation of aggregates.
4. To improve and maintain air quality to levels which do not damage natural systems	++	This policy safeguards the movement of imported aggregates via rail transport and encourages further development of rail infrastructure. This has much more positive long term impacts on air quality than transportation by road as it reduces road transport emissions.
5. To reduce greenhouse gas emissions to reduce the cause of climate change	++	This policy safeguards the movement of imported aggregates via rail transport and encourages further development of rail infrastructure. This has much more positive impacts on aspirations to reduce GHG emissions as rail transport produces less GHG emissions than transportation by road.

6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	0	This policy may have a positive impact on this objective. Transport of imported aggregates by rail is less likely to be disrupted than transport by roads, which may be more vulnerable to flooding.
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	++	This policy will have a positive impact on this objective as it will reduce the volume of aggregates travelling on the local and strategic road network.
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	+	This policy will have a positive impact on this objective as it will reduce the volume of aggregates travelling on the local and strategic road network – reducing congestion and amenity impacts on local communities over the long term.
9. To protect, improve and where necessary restore land and soil quality	0	
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	0	
11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	0	
12. To support Oxfordshire's economic growth and reduce disparities across the county.	++	This policy safeguards the necessary infrastructure to ensure that Oxfordshire can sustainably support its predicted economic growth over the long term.
Summary **Policy M4 seeks to safeguard the necessary infrastructure to transport imported aggregates by rail, reducing the long term cumulative adverse impacts on the environment and local communities experienced by long distance transport of aggregates by road. It will also have subsequent positive impacts on reducing air pollution and GHG emissions and supports sustainable growth of the Oxfordshire economy.**		

Policy M5: Mineral safeguarding

Mineral resources will be safeguarded for the future and development which would prevent or otherwise hinder the possible future working of minerals will not be permitted unless it can be shown that:

- **The need for the development outweighs the economic and sustainability considerations relating to the mineral resource; or**
- **The mineral will be extracted prior to the development taking place; or**

Mineral Safeguarding Areas will be defined, and identified in detailed maps, and will include the following mineral resources:

- **Sand and gravel in the main river valleys and in other areas where there is a proven resource;**
- **Soft sand, limestone and ironstone in existing areas of working, including the areas proposed for working in policy M3;**
- **Fuller's earth.**

Development which would prejudice the operation or establishment of existing or permitted aggregates rail depots identified in or subsequently permitted under policy M4 will not be permitted. Development sensitive to disturbance that could be adversely impacted by the operation of a rail depot will not be permitted in proximity to an existing or permitted rail depot. Permanent secondary and recycled aggregate production facilities will be safeguarded.

Sustainability Appraisal objectives	**Option 1**	**Comments**
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	?	Potential impacts on biodiversity will depend on the location of safeguarded areas relative to the location of sensitive biodiversity resources. If proposed for development, mitigation measures relating to biodiversity should be put in place to avoid adverse effects.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	?	Potential impacts on landscape character and heritage will depend on the location of safeguarded areas relative to the location of sensitive landscapes and heritage features. If proposed for development, mitigation measures relating to landscape and heritage should be put in place to avoid adverse effects.
3. To maintain and improve ground and surface water quality	?	Potential impacts on ground and surface water quality will depend on the location of safeguarded areas relative to the location of sensitive water features. If proposed for development, mitigation measures relating to ground and surface water quality should be put in place to avoid adverse effects.
4. To improve and maintain air quality to levels which do not damage natural systems	?	Potential impacts on air quality will depend on the location of safeguarded areas relative to the location of sensitive receptors. If proposed for development, mitigation measures relating to air quality should be put in place to avoid adverse effects.

5. To reduce greenhouse gas emissions to reduce the cause of climate change	?	Potential impacts will be dependent on the location of safeguarded areas in relation to the potential markets which are served.
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	?	Potential impacts with respect to flood risk will depend on the location of safeguarded areas relative to areas of flood risk. If proposed for development mitigation measures relating to flood risk should be put in place to avoid adverse effects.
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	?	Potential impacts with respect to the road network will depend on the location of safeguarded areas relative to the strategic and local road network. If proposed for development mitigation measures relating to the road network should be put in place to avoid adverse effects.
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	?	Potential impacts with respect to local communities will depend on the location of safeguarded areas relative to residential areas. If proposed for development mitigation measures relating to amenity should be put in place to avoid adverse effects.
9. To protect, improve and where necessary restore land and soil quality	?	Potential impacts with respect to soil quality will depend on the location of safeguarded areas relative to areas of high grade agricultural soils. If proposed for development mitigation measures relating to protection of high grade agricultural soils should be put in place to avoid adverse effects.
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	0	
11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	++	The proposed policy recognises that minerals must not be sterilised by non-mineral development and that mineral deposits are finite and scarce resources that must be safeguarded for the long term, including unknown future requirements.
12. To support Oxfordshire's economic growth and reduce disparities across the county.	++	The proposed policy recognises that minerals must not be sterilised by non-mineral development and that mineral deposits are finite and scarce resources that must be safeguarded for the long term, including unknown future requirements for an increasing population and economic growth.

Summary

The proposed policy recognises that in-situ mineral resources must not be sterilised by non-mineral development and that mineral deposits are finite and scarce resources that must be safeguarded for the long term, including unknown future requirements for an increasing population and economic growth.

Potential impacts which might arise when safeguarded areas are worked will be dependent on the exact location of sites to be worked within those areas. Potential impacts should be addressed through the planning application process, should such sites be proposed for development. Where there is potential for adverse effects on the environment and local communities, these should be adequately mitigated against. Until the point of exploration and extraction, no adverse impacts on sensitive receptors are expected. There is potential for short term positive impacts, in that other, more permanent development does not take place in the safeguarded areas – leaving natural habitats relatively undisturbed, and current air, soil and water quality maintained or even possibly improved over the medium period. Likewise, local communities, landscapes and built heritage may benefit from a lack of more permanent development that might otherwise generate adverse impacts, including increased flood risk or congestion on the local and strategic road network.

Policy M6: Restoration of mineral workings

Minerals workings should be restored to a high quality as quickly as possible and in a phased manner to an after-use appropriate to the location and the capacity of the transport network and which is sympathetic to the character of the surrounding landscape and the amenity of local communities.

Planning permission will not be granted for mineral working unless satisfactory proposals have been made for the restoration, aftercare and after-use, including the means of securing them in the long term.

Where mineral working is proposed on best and most versatile agricultural land, the restoration should be back to agricultural land if this is practicable.

Where restoration could assist or achieve the creation of priority habitats and/or Oxfordshire Biodiversity Action Plan targets, the relevant biodiversity after-use should be incorporated within the restoration scheme.

Where restoration could protect geodiversity and improve educational opportunities this should be incorporated into the proposed restoration scheme, such as by providing for important geological faces to be left exposed and enabling access to the faces.

Where a mineral working site has the potential to provide for local amenity uses, including appropriate sport and recreational uses, these uses should be incorporated into the restoration scheme.

Where appropriate, operators and landowners will be expected to contribute towards the management of restored mineral workings for an extended period beyond any formal aftercare period.

Sustainability Appraisal objectives	**Option 1**	**Comments**
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	++	The requirement for prompt and phased restoration of mineral working sites which achieves the creation of priority habitats or BAP targets or which protects geodiversity and improves educational opportunities has a very positive, and long term impact on biodiversity/geodiversity, although it is recognised that in the short term positive effects will be minor as restoration schemes take time to establish. Extended management responsibility is important.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	++	The requirement for prompt and phased restoration of mineral working sites which is sympathetic to the character of the surrounding landscape has a very positive, long term impact on landscape character, although it is recognised that in the short term positive effects will be minor as restoration schemes take time to establish. Extended management responsibility is important.

3. To maintain and improve ground and surface water quality	++	The requirement for prompt and phased restoration of mineral working sites should have a very positive long term impact on ground and surface water quality, although it is recognised that in the short term positive effects will be minor as restoration schemes take time to establish. Extended management responsibility is important.
4. To improve and maintain air quality to levels which do not damage natural systems	+	The requirement for prompt and phased restoration of mineral working sites should have a positive long term impact on improving air quality.
5. To reduce greenhouse gas emissions to reduce the cause of climate change	0	
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	+	The requirement for prompt and phased restoration of mineral working sites has a long term positive impact on flood risk. Mineral working in the flood plain can offer opportunities to increase flood water storage capacity and reduce the risk of flooding elsewhere.
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	++	The requirement for restoration to be to an after-use appropriate to the location and capacity of the transport network has a positive impact on minimising transportation impacts as it addresses possible transport impacts arising from the after-use.
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	++	The requirement for prompt and phased restoration to be to an after-use appropriate to the location, transport network capacity and amenity of local communities has a positive long term impact on this objective as it addresses possible amenity impacts on local communities arising from the after-use. It also provides for new local amenity uses, such as sport and recreational uses.
9. To protect, improve and where necessary restore land and soil quality	++	The requirement for prompt and phased restoration of agricultural land where working is proposed on such land has long term positive impacts on restoring soil quality.
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	0	

11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	0	
12. To support Oxfordshire's economic growth and reduce disparities across the county.	+	Over the long term, restoration will help to ensure a high quality environment with improved sport and recreational opportunities for local communities, which should indirectly, support economic growth through potential business opportunities, and reduce disparities in access to such facilities for rural communities.

Summary

The requirement for prompt and phased restoration to an after-use appropriate to the location, transport network capacity and amenity of local communities will have a positive long term impact on many of the SA objectives as it provides an opportunity to create or restore habitats and biodiversity, restore landscape character, improve water and soil quality; and address possible amenity impacts on local communities arising from the after-use of minerals sites. It also provides opportunities to develop new local amenity facilities, such as sport and recreational uses which can provide new business opportunities and reduce disparities in access to such facilities for rural communities. Extended management responsibility is important however, to maintain long term benefits, and this is appropriately recognised by the policy.

It should also be noted that mineral working and after-use in the flood plain can offer opportunities to increase flood water storage capacity and reduce the risk of flooding elsewhere, which will be important in the longer term, given the predicted effects of climate change. The sustainability of the policy could be improved in relation to SA Objective 6 by reference to this opportunity.

7.4 Common Core Policies

Symbol	Likely effect on the SA Objective
++	The option is likely to have a **very positive** impact
+	The option is likely to have a **positive** impact
0	**No significant effect / no clear link**
?	**Uncertain** or **insufficient information** on which to determine impact
-	The option is likely to have a **negative** impact
- -	The option is likely to have a **very negative** impact
+/-	The option is likely to have some positive and some negative effect

Policy C1: Flooding

Minerals and waste development will, wherever possible, take place in areas that are not at risk of flooding. Where development takes place in an area of identified flood risk this should only be where alternative locations in areas of lower flood risk have been explored and discounted, and where a flood risk assessment is able to demonstrate that the development will not:

- **impede the flow of floodwater;**
- **displace floodwater and increase the risk of flooding elsewhere;**
- **reduce existing floodwater storage capacity;**
- **adversely affect the functioning of existing flood defence structures.**

Proposals for the restoration of quarries located in areas liable to flood should, where possible, incorporate measures for the storage of floodwater.

Sustainability Appraisal objectives	Option 1	Comments
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	++	Ensuring that minerals development will not increase flood risk will have a short and long term positive impact on ensuring that biodiversity downstream will not be adversely affected by floodwaters which might affect flow and level of water systems as well as levels of pollutants from runoff. Restoration which incorporates floodwater storage will have a long term beneficial impact in terms of reducing existing flood risk and rapid changes in flow and level downstream, and may create additional habitat.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	+	Ensuring that minerals development does not increase flood risk or even reduces flood risk, has the potential to protect landscape character and historic built heritage structures which might otherwise be damaged by floodwaters.
3. To maintain and improve ground and surface water quality	++	Ensuring that minerals development does not increase flood risk or even reduces flood risk will help to maintain surface/ground water quality which might otherwise be subject to pollution from increased volumes and rates of run-off.

4. To improve and maintain air quality to levels which do not damage natural systems	0	
5. To reduce greenhouse gas emissions to reduce the cause of climate change	0	
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	+	This policy addresses flood risk vulnerability although it does not explicitly take account of climate change and appropriate adaptation. It would be appropriate to address climate change adaptation within the policy wording.
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	0	
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	++	This policy will have a positive long term effect on local communities to the extent that it ensures that mineral workings do not increase flood risk, and provide opportunities to reduce existing flood risk which may be experienced by local communities. It also maintains flow and levels of rivers which may be used for recreation. Floodwater storage as part of restoration schemes may over the longer term provide some recreational/amenity opportunities for local communities.
9. To protect, improve and where necessary restore land and soil quality	+	This policy will have a positive effect on restoration of soil quality to the extent that it ensures that mineral workings do not increase flood risk, and provides opportunities to reduce existing flood risk which might otherwise impact on high grade agricultural land or result in pollution of soils from runoff.
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	0	
11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	0	

12. To support Oxfordshire's economic growth and reduce disparities across the county.	+	The policy is likely to have a minor indirect positive effect on the economy as the prevention of flood risk supports economic growth by maintaining business continuity.

Summary

Policy C1 will have positive effects on a number of the SA objectives insofar as it protects valued habitats, flora and fauna, built heritage, landscapes, valuable agricultural land, local communities and businesses from damage, disruption and distress caused by flood events. However the sustainability of the policy in relation to SA objective 6 could be improved by reference to the future predicted impacts of climate change and the incorporation of adaptation measures to account for this, including any likely increased flood risk.

Policy C2: Water Environment

Minerals and waste development will need to demonstrate that there would be no unacceptable adverse impact on or risk to:

- **The quantity or quality of surface or groundwater resources;**
- **The quantity or quality of water abstraction currently experienced by water abstractors unless acceptable alternative provision can be made;**
- **The flow of groundwater at or in the vicinity of the site.**

Proposals for minerals and waste development should ensure the protection of watercourses and canals of significant landscape, nature conservation or amenity value.

Sustainability Appraisal objectives	Option 1	Comments
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	++	This policy has a positive impact on biodiversity in that it will assist to protect sensitive biodiversity from changes in the chemical composition of water systems and availability of groundwater.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	+	To the extent that surface/ground waters contribute to landscape character (e.g. by sustaining certain species of trees, use of canals etc), protection of the quantity/quality of these waters through this policy should have a positive long term effect on landscape character and heritage features.
3. To maintain and improve ground and surface water quality	++	The policy directly and positively addresses ground and surface water quality.
4. To improve and maintain air quality to levels which do not damage natural systems	0	
5. To reduce greenhouse gas emissions to reduce the cause of climate change	0	
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	+	Groundwater flows can have an impact on flood risk, so addressing adverse impacts or risks to groundwater flows has a long term positive impact in relation to this objective.

7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	0	
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	++	Mineral workings may cause dewatering and therefore impact on the availability of groundwater to serve the water supply needs of local communities – this risk is positively addressed through this policy. The policy also recognises the amenity values of maintaining water quality. It could explicitly refer to the recreational values of maintaining such quality as well, as the Thames River for example, is a very important recreational resource.
9. To protect, improve and where necessary restore land and soil quality	+	Maintenance of ground and surface water flows will have a positive impact on protecting the functioning of high grade agricultural land and other soils.
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	0	
11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	0	
12. To support Oxfordshire's economic growth and reduce disparities across the county.	++	To the extent that the economy relies on water supplied from surface and groundwater to function and grow, it is important to protect these resources, which the policy sets out to do.
Summary **Policy C2 has a positive impact on many of the SA objectives, as water quality and quantity are an essential precursor to the proper functioning of ecosystems, landscapes, businesses and local communities. The sustainability of the policy in relation to SA objective 8 could be improved by explicitly referring to the recreational values of maintaining water quality/quantity as well, as the River Thames for example, is a very important recreational resource for the county.**		

Policy C3: Environmental and Amenity Protection **Proposals for minerals and waste development should demonstrate that they will not have an unacceptable adverse impact on the environment, residential amenity and other sensitive receptors.**		
Sustainability Appraisal objectives	**Option 1**	**Comments**
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	+	The policy seeks to protect the environment from unacceptable adverse impacts. The 'environment' encompasses biodiversity and geodiversity although the policy could be more explicit about what is included in the 'environment' and provide some guidance as to what might constitute an "unacceptable adverse impact". It is appreciated that biodiversity and geodiversity is covered by Policy C4 – it would be useful to provide a cross reference to this policy.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	+	The policy seeks to protect the environment and other sensitive receptors from unacceptable adverse impacts. The 'environment' and 'other sensitive receptors' can be construed to include landscape character and historic and built heritage but it would be helpful if the policy could be more explicit in this respect, and provide some guidance as to what might constitute an "unacceptable adverse impact". It is appreciated that landscape character is covered by Policy C5 and the historic environment and archaeology by Policy C6 – it would be useful to provide a cross reference to these policies.
3. To maintain and improve ground and surface water quality	+	The policy seeks to protect the environment and other sensitive receptors from unacceptable adverse impacts. The 'environment' and 'other sensitive receptors' can be construed to include ground and surface water. It is appreciated that ground and surface water quality is covered by Policy C2 – it would be useful to provide a cross reference to this policy.
4. To improve and maintain air quality to levels which do not damage natural systems	+	The policy seeks to protect the environment and other sensitive receptors from unacceptable adverse impacts. The 'environment' and 'other sensitive receptors' can be construed to include air quality but it would be helpful if the policy could be more explicit in this respect, and provide some guidance as to what might constitute an "unacceptable adverse impact".
5. To reduce greenhouse gas emissions to reduce the cause of climate change	+	An indirect positive effect on this SA objective is expected as a result of the fact that the impact of air emissions on sensitive receptors is covered by the policy. This is mentioned in the supporting text although not explicitly in the policy text.

6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	+	An indirect positive effect on this SA objective can be expected as a result of the fact that protecting the natural functioning of the environment, including river systems, should ensure these systems can absorb future flood events.
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	+	The supporting text indicates that the potential impact of noise, dust, odour, other air emissions, vibration, vermin and litter which might arise from minerals transportation will be assessed. However the policy would be strengthened by explicit mention of these potential impacts and that transportation of materials can also lead to some of these impacts (i.e. that 'development' includes transportation).
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	+	The policy directly aims to address the negative impacts of minerals extraction on local communities. However it could be strengthened by explicit reference in the policy text to the types of impacts that will be considered, and that potential impacts on human health, not just residential amenity, will be considered.
9. To protect, improve and where necessary restore land and soil quality	0	
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	0	
11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	0	
12. To support Oxfordshire's economic growth and reduce disparities across the county.	+	The policy seeks to protect the environment and other sensitive receptors from unacceptable adverse impacts. The 'environment' and 'other sensitive receptors' can be construed to include local businesses and jobs (which includes employment in for example, the tourism/agricultural sector which would be sensitive to minerals development) but it would be helpful if the policy could be more explicit in this respect, and provide some guidance as to what might constitute an "unacceptable adverse impact".
Summary **Policy C3 seeks to protect the environment, residential amenity and other sensitive receptors from unacceptable adverse impacts. The 'environment' and 'other sensitive receptors' can be construed to include those SEA elements covered by the SA objectives, including biodiversity, landscape character and historic and built heritage, air and water; but it would be helpful if the policy could be more explicit in defining what constitutes the 'environment' or a 'sensitive**		

receptor' in order to give more guidance to developers. It would also be helpful to provide some guidance as to what might constitute an "unacceptable adverse impact". In addition, the potential impacts on human health, not just residential amenity should be considered (to comply with the SEA Directive requirements to consider effects on human health as captured by SA objective 8), and it might also be appropriate to consider local businesses as sensitive receptors, particularly where such businesses are dependent on a high quality environment and good amenity (e.g. tourism sector).

A cross reference in the supporting text to the Common Core Policies which deal with distinct elements of the 'environment' would also be helpful – for example highlighting linkages to Policy C2 for ground and surface water, Policy C4 for Biodiversity and Geodiversity, Policy C5 for Landscape and Policy C6 for the Historic Environment and Archaeology.

Policy C4: Biodiversity and Geodiversity

Proposals for minerals and waste development should demonstrate that the development will not have an unacceptable adverse impact on sites designated as internationally, nationally or locally important for nature conservation, including the Oxfordshire Conservation Target Areas and the setting of those areas.

Mineral working and waste management development should not damage or destroy irreplaceable habitats or biodiversity, including ancient woodland and species rich grassland.

The County Council will seek the enhancement of Conservation Target Areas to implement Oxfordshire Biodiversity Action Plan (BAP) targets within and close to areas of mineral working. Mineral extraction will not be permitted unless the long term maintenance of BAP Priority Habitats and appropriate contributions to Oxfordshire BAP targets through the Conservation Target Area approach have been secured.

Nationally and regionally important geological features including geological Sites of Special Scientific Interest and Regionally Important Geological and Geomorphological Sites should be protected from harmful development and retained in situ unless there are exceptional reasons justifying their removal, in which event their presence should be appropriately recorded.

Sustainability Appraisal objectives	**Option 1**	**Comments**
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	++	This policy directly addresses biodiversity/ geodiversity and will have a very positive long term impact on the attainment of this objective.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	++	The protection and enhancement of natural habitats and valued geological features will have a positive long term impact on protecting landscape character, as these habitats and geological features are a major component of the local landscape character.
3. To maintain and improve ground and surface water quality	++	Conservation and restoration of natural habitats will indirectly assist to maintain and improve water quality over the long term as these habitats provide vital ecosystem services, including maintaining the proper functioning of the water cycle.
4. To improve and maintain air quality to levels which do not damage natural systems	++	Conservation and restoration of natural habitats will indirectly assist to maintain and improve air quality over the long term as these habitats provide vital ecosystem services, including maintaining air quality through filtering of pollutants and capture of CO_2.
5. To reduce greenhouse gas emissions to reduce the cause of climate change	++	Conservation and restoration of natural habitats will indirectly assist to reduce GHG emissions as these habitats provide vital ecosystem services, including the capture of $C0_2$, an important GHG.

6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	++	Conservation and restoration of natural habitats will indirectly assist to reduce flood risk as these habitats provide vital ecosystem services, including maintaining the proper functioning of the water cycle and absorbing run-off.
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	0	
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	++	Enhancement of Conservation Target Areas and protection of valued habitats/geological features will have an indirect long term beneficial impact on people and local communities - by providing ecosystem services that function properly – i.e. providing clean air and water and fertile soils and thus sustaining communities and the economy; and by providing access to the natural environment for recreation and by enhancing nature – which has an impact on general wellbeing and mental health.
9. To protect, improve and where necessary restore land and soil quality	++	Conservation and enhancement of natural habitats will assist to restore land and soil quality as these habitats provide vital ecosystem services, including providing the appropriate nutrients to restore soil quality and prevent loss of soils through flooding/run-off.
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	0	
11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	0	
12. To support Oxfordshire's economic growth and reduce disparities across the county.	++	Enhanced Conservation Target Areas and protected natural habitats/geological features indirectly support economic growth – by providing opportunities for employment through industries such as tourism, agriculture and arboriculture; providing essential ecosystem services; and maintaining wellbeing and health of employees through access to natural areas and opportunities for active recreation in these areas.

Summary

Policy C4 will have a positive impact on many of the SA objectives – as the protection of biodiversity provides many direct and indirect benefits for other SEA elements. Biodiversity/geodiversity features are essential elements of landscape character and quality. The proper functioning of ecosystem services which are provided by the flora and fauna resident within Conservation Target Areas will have long term positive impacts on air, water, soil, human health and the economy. Other long term benefits include reduced flood risk and carbon capture.

Policy C5: Landscape **Proposals for minerals and waste development should demonstrate that the development will protect and where possible enhance the landscape quality of Oxfordshire and will take account of the landscape character areas identified in the Oxfordshire Wildlife and Landscape study. Appropriate measures should be taken to mitigate potential adverse visual impacts through siting, design and landscaping.**		
Sustainability Appraisal objectives	**Option 1**	**Comments**
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	++	The protection and enhancement of landscape character will indirectly help to protect natural habitats and geological features, as these habitats and geological features are a major component of the local landscape character.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	++	This policy directly addresses the landscape character element of this SA objective and will have a very positive impact on the attainment of this objective.
3. To maintain and improve ground and surface water quality	+	This policy should indirectly have a positive impact on improving ground and water quality, as landscape character includes such water features.
4. To improve and maintain air quality to levels which do not damage natural systems	+	This policy should indirectly have a positive impact on air quality, as protection of landscape character includes those natural habitats which make up that landscape character and which provide ecosystem services, including the maintenance of air quality.
5. To reduce greenhouse gas emissions to reduce the cause of climate change	+	This policy should indirectly have a positive impact on reducing GHG emissions, in that protection of landscape character includes the natural habitats which make up that landscape character, and these natural habitats provide ecosystem services, including carbon capture.
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	+	This policy should indirectly have a positive impact on flood risk, in that protection of landscape character includes the natural habitats which make up that landscape character, and these natural habitats provide ecosystem services, including maintaining the water cycle and reducing run-off rates and flows.

7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	0	
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	+	This policy should indirectly have a positive impact on local communities, in that protection of landscape character in turn provides protection of local amenity and addresses any adverse visual effects for residents.
9. To protect, improve and where necessary restore land and soil quality	+	This policy should indirectly have a positive impact on soil quality in that protection of landscape character includes the natural habitats which make up that landscape character, and these natural habitats provide ecosystem services, including providing the appropriate nutrients to restore soil quality and prevent loss of soils through flooding/run-off.
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	0	
11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	0	
12. To support Oxfordshire's economic growth and reduce disparities across the county.	+	Protection of landscape quality indirectly supports economic growth – by providing opportunities for employment through industries such as tourism; providing essential ecosystem services through the habitats protected within these landscapes; and maintaining wellbeing and health of employees through access to high quality natural areas and opportunities for active recreation in these areas.
Summary **Policy C5 will have a positive impact on many of the SA objectives – as the protection of landscape quality and character provides many direct and indirect benefits for other SEA elements. For example the proper functioning of ecosystem services which are provided by the flora and fauna resident within these landscape features will indirectly but positively impact over the long term on air, water, soil, human health and the economy, and provide such benefits such as reduced flood risk and carbon capture.**		

Policy C6: Historic environment and archaeology

Proposals for minerals and waste development will be considered in the light of the need to protect and conserve Oxfordshire's historic assets and the setting of those assets, including Blenheim Palace, scheduled ancient monuments, listed buildings, conservation areas, historic battlefields, and registered parks and gardens.

Scheduled Ancient Monuments, other archaeological remains of national importance and their settings should be preserved in situ. For all other remains of regional or local importance preservation in situ will be preferred; where this is not appropriate, and for all other remains, adequate provision should be made for their excavation and recording.

Sustainability Appraisal objectives	Option 1	Comments
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	+	Insofar as protection of the setting of historic features and built heritage also provides for the protection of biodiversity, including species which are resident within these features, the policy has an indirect positive impact on biodiversity/geodiversity.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	++	This policy directly addresses the historic/built heritage element of this SA objective and will have a very positive impact on the attainment of this objective.
3. To maintain and improve ground and surface water quality	0	
4. To improve and maintain air quality to levels which do not damage natural systems	0	
5. To reduce greenhouse gas emissions to reduce the cause of climate change	0	
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	0	

7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	0	
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	+	Insofar as the protection of historic features and built heritage also provides for the protection of local amenity and valued assets for recreation and relaxation, the policy has an indirect positive impact on local communities.
9. To protect, improve and where necessary restore land and soil quality	0	
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	0	
11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	0	
12. To support Oxfordshire's economic growth and reduce disparities across the county.	+	Insofar as the protection of historic features and built heritage also protects valued assets for recreation and relaxation and the development of tourism related economic activity, the policy has an indirect positive impact on the economy.
Summary **Policy C6 has a positive impact on SA objective 2 as it relates to the protection of the historic and built heritage. It also has indirect positive impacts on a number of the other SEA elements, in particular landscape character, biodiversity and the economy. There is no direct relationship between this policy and the other SA objectives.**		

Policy C7: Transport

Minerals and waste development will only be permitted where provision is made for convenient access to and along the strategic road network in a way that maintains or improves:

- **the safety of all road users including pedestrians;**
- **the efficiency and quality of the road network;**
- **residential and environmental amenity.**

Proposals for mineral working should:
a) wherever possible, transport minerals by rail, water, pipeline or conveyor, rather than by road;
b) minimise the number of miles that have to be travelled to reach markets if this can be achieved using roads suitable for lorries.

Sustainability Appraisal objectives	Option 1	Comments
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	++	Transportation that maintains or improves environmental amenity should have a positive impact on biodiversity, in that some species are sensitive to the dust, vibration and noise of traffic and reduction of these impacts will be positive. However the installation of alternative infrastructure for transportation (water based, pipeline, and conveyor) also has the potential to adversely impact on biodiversity where such infrastructure is proposed.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	++	Transportation that maintains or improves environmental amenity should have a positive impact on landscape character and built heritage. Dust, vibration and traffic noise can disrupt the serenity of landscape character and busy roads result in visual intrusion. Dust and vibration can have negative impacts on sensitive built structures, which are also sensitive to air pollution from transport emissions. Reduction of these impacts will be positive.
3. To maintain and improve ground and surface water quality	+	This policy will help to reduce the temporary adverse impacts on surface water which can arise from contaminated dust on roads from the transportation of minerals causing pollution through runoff.
4. To improve and maintain air quality to levels which do not damage natural systems	++	Reducing the number of road miles travelled to reach markets should have a positive impact on improving air quality, as a result of reduced air emissions from minerals traffic. Improving the efficiency and quality of the road network should also have a positive effect by reducing congestion, and thus the higher levels of emissions associated with slow moving traffic.
5. To reduce greenhouse gas emissions to reduce the cause of climate change	+	Reducing the number of road miles travelled to reach markets should have a positive impact on reducing GHG emissions as a result of reduced air emissions from minerals traffic. Improving the efficiency and quality of the road network should also have a positive effect by reducing congestion, and thus the higher levels of emissions associated with slow moving traffic.

6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	0	
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	++	This policy directly addresses this SA objective and will have a very positive impact on the attainment of this objective to the extent that it is deliverable.
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	++	This policy will have a very positive impact on minimising impacts on local communities of new minerals working activity as it seeks to address the transportation impacts of minerals development (through addressing residential amenity and road safety).
9. To protect, improve and where necessary restore land and soil quality	+	This policy will help to reduce the adverse impacts on soil quality which can arise from contaminated dust from the transportation of minerals, including runoff from road surfaces.
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	0	
11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	+	The policy aims to provide the necessary and appropriate infrastructure to ensure that minerals are sustainably transported to their markets, thus assisting to meet Oxfordshire's sub-regional apportionment.
12. To support Oxfordshire's economic growth and reduce disparities across the county.	++	The policy will assist to support Oxfordshire's economic growth by providing the necessary and appropriate infrastructure to ensure that minerals are sustainably transported to their markets. It should also assist to ease further congestion which has an impact on businesses reliant on road transport. By addressing impacts on road users and local communities it aims to reduce disparities in terms of the unequal distribution of effects which are felt by those communities/businesses in close proximity to minerals working areas.

Summary

Transportation of minerals that maintains or improves environmental and residential amenity has potential for positive impacts on biodiversity, landscape character and built heritage, local communities, businesses and sensitive biodiversity/soil/water features in the vicinity of roads used by minerals traffic. Reducing the number of road miles travelled to reach markets and addressing congestion through an efficient road network is likely to have a positive impact on SA objectives for air quality and greenhouse gas emissions, as a result of subsequently reduced air emissions from minerals traffic, as well as facilitating the efficient functioning of those businesses that rely on the road network. The policy aims to provide the necessary and appropriate infrastructure to ensure that minerals are sustainably transported to their markets, thus positively assisting to meet Oxfordshire's sub-regional apportionment and supporting continued economic growth.

Policy C8: Rights of Way **The integrity of the rights of way network should be maintained and if possible retained in situ. Diversions should be safe, attractive and convenient and, if temporary, should be reinstated as soon as possible. If permanent diversions are required, these should seek to enhance and improve the public rights of way network. Improvements and enhancements to the rights of way network will be encouraged and public access will be sought to restored mineral workings, especially if this can be linked to wider provision of green infrastructure.**		
Sustainability Appraisal objectives	**Option 1**	**Comments**
1. To protect, maintain, and enhance Oxfordshire's biodiversity and geodiversity including natural habitats, flora and fauna and protected species	?	Public access to restored mineral workings should be carefully managed so as to not adversely impact on habitats and species resident within the restored area.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	+	Improved public access can indirectly assist with the enhancement of landscape character and the settings of historic/built heritage.
3. To maintain and improve ground and surface water quality	0	
4. To improve and maintain air quality to levels which do not damage natural systems	+	Enhancements to the public rights of way network could have an indirect positive effect on improving air quality by encouraging people to make local trips on foot or bicycle where such improvements are provided.
5. To reduce greenhouse gas emissions to reduce the cause of climate change	+	Enhancements to the public rights of way network could have an indirect positive effect on reducing GHG emissions by encouraging people to make local trips on foot or bicycle where such improvements are provided.
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	0	

7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	+	Enhancements to the public rights of way network could have an indirect positive effect by encouraging people to make local trips on foot or bicycle where such improvements are provided, reducing traffic conflicts on local roads.
8. To minimise negative impacts of waste management facilities and mineral extraction on people and local communities	++	The policy provides opportunities for long term enhancement of local amenity and improved access to the countryside, as well as improvements to the health of local people through increased opportunities for physical recreation.
9. To protect, improve and where necessary restore land and soil quality	+	Improvements to the public right of way system may result in minor positive impacts on soil quality, by preventing soil erosion from unmanaged recreational use in sensitive areas.
10. To contribute towards moving up the waste hierarchy in Oxfordshire.	0	
11. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	0	
12. To support Oxfordshire's economic growth and reduce disparities across the county.	+	The policy provides long term opportunities for improved access to the countryside, as well as improvements to the health of local people through increased opportunities for physical recreation. Improved access provides business opportunities for local people and addresses disparities in health and wellbeing.

Summary

Enhancements to the public rights of way network should have a long term indirect positive effect on a number of the SA objectives, by encouraging people to make local trips on foot or bicycle, reducing traffic conflicts on local roads, reducing GHG emissions and improving local air quality, improving health through physical activity and generating business opportunities through recreation. Improved public access can also indirectly assist with the enhancement of landscape character and the settings of historic/built heritage.

Public access to restored mineral workings should be carefully managed so as to not adversely impact on habitats and species resident in the restored area. A reference to this effect should be included in the supporting text to improve sustainability in relation to SA objective 1.