Norfolk County Council

# Norfolk Minerals and Waste Local Plan Review

# Initial Sustainability Appraisal Report –Part B

May 2018




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T. McCabe – Executive Director
Community and Environmental Services
Norfolk County Council
Martineau Lane
Norwich
NR1 2SG

www.norfolk.gov.uk

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**Abbreviations**

Acronyms and other abbreviations used in this report and listed below:

AONB – Area of Outstanding Natural Beauty
AQMA – Air Quality Management Area
ASNW – Ancient Semi-Natural Woodland
BGS –British Geological Survey
BMV – Best and Most Versatile
CD&E – Construction, demolition and excavation
C&I – Commercial and industrial
CWS – County Wildlife Site
DPD – Development Plan Document
EEFM – East of England Forecasting Model
ELV – End-of-Life Vehicle
HGV – Heavy Goods Vehicle
HRA –Habitats Regulations Assessment
IDB – Internal Drainage Board
IRZ – Impact Risk Zone
LAA –Local Aggregate Assessment
LACW – Local Authority Collected Waste
LNR – Local Nature Reserve
LPA –Local Planning Authority
M&WLPR – Minerals and Waste Local Plan Review
MPA –Minerals Planning Authority
MRF – Materials Recycling Facility
NNR – National Nature Reserve
NPPF – National Planning Policy Framework
NPPG – National Planning Practice Guidance
ONS – Office of National Statistics
PAWS – Plantation on Ancient Woodland
PRoW – Public Right of Way
RDF – Refuse Derived Fuel
SA – Sustainability Appraisal
SAC – Special Area of Conservation
SEA – Strategic Environmental Assessment
SPA – Special Protection Area
SSA – Site Specific Allocations
SSSI – Site of Special Scientific Interest
WEEE – Waste electrical and electronic equipment
WFD – Water Framework Directive
WPA –Waste Planning Authority

## Non –Technical Summary

The principles of the planning system for England are set out in the Planning and Compulsory Purchase Act 2004 (as amended by the Localism Act 2010), the National Planning Policy Framework, National Planning Policy for Waste and the National Planning Practice Guidance.

The adopted Norfolk Minerals and Waste Development Framework consists of three Development Plan Documents (DPDs): the 'Core Strategy and Minerals and Waste Development Management Policies DPD', the Minerals Site Specific Allocations DPD and the Waste Site Specific Allocations DPD. Together these documents contain the current policies for the development and use of land for minerals s extraction and associated development and waste management facilities in Norfolk. These documents form the current Local Plan for minerals and waste planning in Norfolk up to the end of 2026.

As the Core Strategy was adopted over five years ago, a joint review of the three adopted DPDs is being carried out to ensure that the policies within them remain up-to-date, to extend the Plan period to 2036 and to consolidate them into one Norfolk Minerals and Waste Local Plan (M&WLP). This process is the Minerals and Waste Local Plan Review (NM&WLPR).

The M&WLPR includes a forecast of the quantities of waste that need to be planned for over the Plan period to 2036 and criteria based policies to determine planning applications for waste management facilities. The Initial Consultation proposed that the M&WLPR will not allocate specific sites for waste management facilities. The M&WLPR includes the forecast quantities of sand and gravel, carstone and silica sand that need to be planned for during the period to 2036, in order to provide a steady and adequate supply of minerals, and the policies to be used to determined planning applications for mineral extraction and associated development.

The Initial Consultation document also includes all the sites that were proposed for mineral extraction in response to a 'call for mineral extraction sites' carried out for the purpose of the M&WLPR: 41 sites for sand and gravel extraction, one site for carstone extraction and 3 sites for silica sand extraction, and an initial conclusion on the suitability of each site. The Initial Consultation also includes four areas of search for future silica sand extraction.

Under the Planning and Compulsory Purchase Act, there is a requirement for local planning authorities to undertake a Sustainability Appraisal (SA) on its Local Plan. Additionally, in June 2004, an assessment of the effects of certain plans and programmes on the environment, known as Strategic Environmental Assessment (SEA), became a requirement under European Directive 2001/42/EC. This Directive also applies to Local Plans.

In accordance with the Act, the Directive, and Government guidance a combined SA/SEA is being undertaken on the Minerals and Waste Local Plan Review. The Scoping Report published in March 2015 was the first stage (Stage A) in this process (the M&WLPR was referred to as the Core Strategy Review in the Scoping Report).

The SA/SEA process follows the requirements of the SEA Directive and Regulations and the National Planning Practice Guidance. The SEA/SA Scoping Report built on the previous SEA/SA for the Minerals and Waste Site Specific Allocations and Minerals and Waste Core Strategy, to provide an up to date assessment for the M&WLPR.

**The Initial Sustainability Appraisal Report has been published in two parts. Part A is the Scoping Report and Part B assesses the effects of alternative options for the Norfolk Minerals and Waste Local Plan Review.**

The Scoping Report (Part A) provides an outline of the baseline information, key issues, relevant plans and programmes and SA/SEA framework and includes the following information:

- Statutory context;
- Influences of other plans and programmes;
- Sustainability baseline information;
- Issues for sustainable development; and
- Sustainability Appraisal Framework

**Policy, Plans and Programmes Review**
A review of relevant European, national and local planning policy has been undertaken as part of the SA/SAEA process. The review highlights how the Norfolk Minerals and Waste Local Plan Review can contribute to delivering wider national and local objectives, whilst ensuring that key environmental protection objectives (such as the EU Wild Birds Directive and EU Habitats Directive) are respected.

**Sustainability Baseline**
The environmental, social and economic baseline for Norfolk was gathered in order to provide a base to predict future baseline evolution and assess the effects of the Norfolk Minerals and Waste Local Plan Review. Baseline information collection was based on specific indicators included in the monitoring and implementation framework of the adopted Norfolk Minerals and Waste DPDs. Analysis of trends and targets was used to help predict how the baseline might evolve without the implementation of the M&WLPR (referred to as the Core Strategy Review in the Scoping Report).

**Sustainability Problems and Opportunities**
A number of problems and issues were identified from a review of the baseline information which could affect Norfolk and its sustainable development in the future. Key problems and issues of relevance to the Norfolk Minerals and Waste Local Plan Review included:

**Climate change**
• Norfolk is predicted to have warmer, drier, summers and wetter warmer winters. Sea level is predicted to rise.
• Carbon dioxide and methane emissions should be reduced from minerals extraction and associated development, and waste management facilities by: reducing the quality of biodegradable waste landfilled, reducing road transportation, encouraging energy efficient buildings and the provision of low carbon or renewable energy sources.

**Air quality**
• Air quality Management Areas are designated in King's Lynn, Norwich and Swaffham due to traffic congestion.
• Minimise air pollution emissions from minerals extraction and associated development, from waste management facilities and associated transportation.

**Population**
• Deprivation is higher in the urban areas of Norwich, Great Yarmouth, King's Lynn and Thetford.
• Increasing population requiring additional housing and associated facilities
• Need to ensure that minerals and waste developments do not adversely affect the amenity of local communities, through their location and operations, including transport impacts and cumulative impacts.

**Historic Environment**
• Potential for minerals extraction and associated development and waste management facilities to affect the setting of heritage assets.
• Need to protect and enhance heritage assets through appropriate location and design of minerals and waste developments and restoration schemes.

**Biodiversity, flora and fauna**
• Problems of land take for development, water pollution affecting nature conservation designations and the loss of finite geodiversity resources.
• Need to protect and enhance habitats, species and geodiversity features as part of planning for minerals extraction and associated development and waste management facilities, including through restoration schemes.

**Landscape**
• Gradual loss of countryside, landscape and tranquillity to development.
• The potential for minerals extraction and associated development and waste management facilities to impact on the AONB and Heritage Coast as well as landscape character
• Need to protect and enhance the landscape through appropriate location and design of minerals extraction and associated development and waste management facilities, including through restoration schemes.

**Human health**

• High levels of health deprivation in the urban areas of Norwich, King's Lynn and Great Yarmouth.
• Poor housing quality in parts of Norwich, North Norfolk, king's Lynn and West Norfolk and Breckland.
• Need to ensure that minerals extraction and associated development and waste management facilities do not exacerbate health deprivation and take into account cumulative impacts.
• Provide enhancement to public open space, public rights of way and recreation through restoration schemes.

**Water, soil**

• Only a small percentage of the rivers in Norfolk have been classified as good status or better status by the Environment Agency.
A significant proportion of the county is covered by Groundwater Protection Zones
• Need to preserve Norfolk's best and most versatile (grades 1, 2, or 3a) agricultural land
• Need to ensure that minerals extraction and waste management development does not negatively affect surface water quantity or quality or groundwater quantity or quality

**Material Assets**

• Need sufficient facilities to enable waste to be managed as high up the waste hierarchy as practicable, and especially minimise the quantity of waste disposed of to landfill.
• Need sufficient facilities to enable waste to be disposed of, or in the case of mixed municipal waste from households, recovered in line with the proximity principle
• Variable production of recycled and secondary aggregates
• Increasing production of silica sand over the last 10 years
• Continuing lower levels of sand and gravel production since 2007
• Crushed rock from the elsewhere in the UK is imported to Norfolk through railheads located at Norwich, Snetterton and Brandon
• Marine bourne crushed rock from outside the UK is landed at a wharf in Great Yarmouth
• Need to safeguard mineral resources, extraction sites and infrastructure from being sterilised or prejudiced by non-mineral development
• Need to safeguard existing significant waste management facilities from being prejudiced by non-waste development

**SA/SEA Framework**

The SEA Directive does not specifically require the use of objectives or indicators, but they are a recognised way in which environmental, social and economic effects can be described, analysed and compared. Objectives and indicators were developed based on the local planning and sustainability objectives, and review of the baseline and key issues for Norfolk.

The 13 sustainability objectives to be used in the assessment of the Minerals and Waste Local Plan Review are:

1. To adapt to and mitigate the effects of climate change by reducing contributions to climate change
2. To improve air quality in line with the National Air Quality Standards
3. To minimise noise, vibration and visual intrusion
4. To improve accessibility to jobs, services and facilities and reduce social exclusion
5. To maintain and enhance the character of the townscape and historic environment
6. To protect and enhance Norfolk's biodiversity and geodiversity
7. To promote innovative solutions for the restoration and after-use of minerals and waste sites
8. To protect and enhance the quality and distinctiveness of the countryside and landscape
9. To contribute to improved health and amenity of local communities in Norfolk
10. To protect and enhance water and soil quality in Norfolk
11. To promote sustainable use of minerals and waste resources
12. To reduce the risk of current and future flooding at new and existing development
13. To encourage employment opportunities and promote economic growth

Factors, to be used in scoring each proposed site, area and policy against each SA Objective have been proposed for use in the Norfolk Minerals and Waste Local Plan Review.

**Alternatives**
Development of the Minerals and Waste Local Plan Review will go through a number of stages, including Initial Consultation, Preferred Options and Pre-Submission (detailed in the consultation section below).

Following a 'call for mineral extraction sites' in July 2017, the sites submitted have been subject to Sustainability Appraisal and all the submitted sites are contained in the Initial Consultation document as alternative options for mineral extraction during the Plan period.

At the current stage (Initial Consultation) the initial assessments of the proposed sites and areas of search for future mineral extraction have been published for consultation. The initial assessments include an initial conclusion regarding the suitability of the proposed Specific Sites and Areas of Search for inclusion in the M&WLPR for future mineral extraction.

Planning policies are also contained in the Initial Consultation document. The planning policies have been subject to Sustainability Appraisal. Where there are alternative policy options, these alternatives have also been subject to Sustainability Appraisal.

**Consultation**
In accordance with the SEA Directive, Norfolk County Council carried out a Scoping consultation on the Silica Sand Review, and the Minerals and Waste Core Strategy Review (which is now called the Minerals and Waste Local Plan Review) with statutory environmental bodies and other key stakeholders for a six week period in March and April 2015. Consultation comments have been addressed as much as possible in the subsequent stages of the SA/SEA and the development of the Norfolk Minerals and Waste Local Plan Review. The consultation comments received were published, along with Norfolk County Council's planning officer responses, in the Initial Consultation Feedback Report in June 2015. The Feedback Report is available to view on Norfolk County Council's website at: www.norfolk.gov.uk/nmwdf

The Initial Sustainability Appraisal Report Parts A and B (this document) will accompany the Initial Consultation version of the 'Norfolk Minerals and Waste Local Plan Review' for a six week period of consultation. The documents will be sent out to the three statutory consultees, Historic England, Environment Agency, and Natural England, and to other stakeholders and the public. Comments received will be documented, along with a commentary on how these responses were taken on board in relation to development of the Preferred Options version of the Minerals and Waste Local Plan Review.

The Preferred Options version of the Minerals and Waste Local Plan Review will also be subject to a six week consultation period (expected to take place in winter 2018/19), and will be accompanied by a draft Sustainability Appraisal Report.

The responses received to the Preferred Options consultation will inform the Pre-Submission version of the Norfolk Minerals and Waste Local Plan Review, which will be published for representations on soundness and legal compliance in 2019, prior to its submission to the Secretary of State, for examination by an independent Planning Inspector.

## Developing Strategic Alternatives

Development of the Minerals and Waste Local Plan Review will go through a number of stages, including Initial Consultation, Preferred Options and Pre-Submission.

Following a 'call for mineral extraction sites' in July 2017, the sites submitted have been subject to Sustainability Appraisal and all the submitted sites are contained in the Initial Consultation document as alternative options for mineral extraction during the Plan period.

At the current stage (Initial Consultation) the initial assessments of the proposed sites and areas of search for future mineral extraction have been published for consultation. The initial assessments include an initial conclusion regarding the suitability of the proposed specific sites and areas of search for inclusion in the M&WLPR for future mineral extraction. The Sustainability Appraisal has helped to determine the initial conclusion for each proposed site.

Planning policies are also contained in the Initial Consultation document. The planning policies have been subject to Sustainability Appraisal. Where there are alternative policy options, these alternatives have also been subject to Sustainability Appraisal. The policies where alternative options have been considered are:

WP1: Waste management capacity to be provided

WP2: Spatial strategy for waste management facilities

MP1: Provision for minerals extraction

MP2: Spatial Strategy for minerals extraction

These policies contain the quantity of minerals (MP1) and waste (WP1) to plan for and contain the spatial strategy for the location of mineral extraction sites (MP2) and waste management facilities (WP2). These strategic alternative options are being consultation on through the Initial Consultation stage and have also been subject to sustainability appraisal. The assessment has helped to determine the proposed policy wording.

## Likely significant environmental effects

The proposed specific sites and defined areas of search have been assessed against the 13 SA/SEA objectives to determine whether they would have positive, neutral or negative effects during the extraction phase and also post extraction. The effects are summarised in Table 6.1 of this report and vary by site, depending on the location of the proposed site in relation to planning constrains (included designated landscapes, designated ecological sites, heritage assets and sensitive receptors to amenity impacts).
The proposed planning policies have also been assessed against the 13 SA/SEA objectives to determine whether they would have positive, neutral or negative effects in the short, medium and long term. The effects are summarised in Table 6.2 of this report.

## Mitigation measures

In accordance with SA guidance, measures to prevent, reduce or offset significant adverse effects of implementing the Minerals and Waste Local Plan Review have been considered based on the findings of the policy, proposed site and area of search appraisals. Typical mitigation measures recommended include requiring specific HGV routing, restoration to specified biodiversity habitats and the need for advanced screen-planting of trees. Appropriate location of mineral extraction sites and waste management facilities is the most significant way that potential impacts can be mitigated.

## Monitoring of significant effects

A draft monitoring regime has been established in order to monitor the effects implementation of the plan has on sustainability. To monitor effects on the 13 SA objectives, a total of 39 indicators will be monitored with the results published in the Monitoring Report.

## Introduction

### 1.1 Terms of Reference

Under the European Directive 2001/42/EC, on the assessment of the effects of certain plans and programmes on the environment (also known as the 'Strategic Environmental Assessment (SEA) Directive'), and the resulting Environmental Assessment of Plans and Programmes Regulations 2004, a SEA is required to ensure that the environmental effects of the Norfolk Minerals and Waste Local Plan Review are considered.

Under the Planning and Compulsory Purchase Act and the Town and Country Planning (Local Planning) (England) Regulations 2012, there is also a requirement for local planning authorities to undertake a Sustainability Appraisal (SA) on their Local Plan. The Scoping Report, published in March 2015 and revised in October 2015, is Stage A in the SEA/SA process. The Initial Sustainability Appraisal Report (Part B) is stage B in the SEA/SA process.

Information on the legislative required and approach are contained within Section 2 of the 'Initial Sustainability Appraisal (Part A) Scoping' document.

### 1.2 Purpose of the Initial Sustainability Appraisal Report (Part B)

The 'Initial Sustainability Appraisal (Part A) Scoping' meets the requirements of Stage A of an SEA as required by the SEA Directive. Part A presents information on:

- the review of policies, plans and programmes,
- baseline environmental, social and economic information and key issues for Norfolk,
- sets the context and objectives for the SEA/SA Framework

The 'Initial Sustainability Appraisal Report (Part B)' meets the requirements of Stage B of an SEA "developing and refining alternatives and assessing effects" as required by the SEA Directive. Part B presents information on:

- the Norfolk Minerals and Waste Local Plan Review strategic options;
- the results of the appraisal to predict the effects of the alternatives for the Minerals and Waste Local Plan Review;
- the evaluation of the effects and alternatives for the Minerals and Waste Local Plan Review;
- recommendations to mitigate adverse effects and maximise benefits;
- the proposed monitoring framework.

Together, Parts A and B form an Initial Sustainability Appraisal Report to fulfil the requirements of the Environmental Report as required by Article 5 (1) of the SEA Directive. The SA Report on the Minerals and Waste Local Plan Review is a key output of the appraisal process, presenting information on the effects of the Minerals and Waste Local Plan Review.

### 1.3 Links with wider studies

#### Habitats Regulations Assessment

Under the European Directive 92/43/EEC) on the Conservation of Natural Habitats and Wild Fauna and Flora (also known as the 'Habitats Directive') the resulting Conservation of Habitats and Species Regulations 2017, a Habitats Regulations Assessment (HRA) is required where a plan may give rise to significant effects on European designated sites, known as Natura 2000 sites.

Natura 2000 sites consist of Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites, and also include potential SPA (pSPA) and candidate SAC (cSAC). Within Norfolk there are a number of SPAs and SACs and therefore a HRA is required.

A HRA Task 1 'Test of Likely Significance' will be undertaken for the Minerals and Waste Local Plan Review to determine whether there are likely to be any significant effects on Natura 2000 sites. If significant effects are determined then a Stage 2 'Appropriate Assessment' will be required. The HRA process will be undertaken in parallel with the SEA/SA and the Minerals and Waste Local Plan Review processes and will feed into each other.

### 1.4 Limitations of the Initial SA Report (Part B)

Norfolk County Council relied on published data and information provided by others (as well as data obtained by NCC) in the production of this Initial SA Report (Part B). The information presented in this report is the result of a desk based review and no formal requests for records have been made. The baseline information collected in the Scoping Report (Part A) was the most up-to-date information available when it was produced; however, it is possible that conditions described in the Scoping Report may change over time. It is likely that this dataset will be up-dated throughout the SEA/SA process and for post-adoption monitoring requirements as new information becomes available or other information presents itself.

### 1.5 Structure of the Initial SA Report (Part B)

The Initial SA Report (Part B) contains stage B of the SA/SEA process "developing and refining alternatives and assessing effects" and is set out as follows:

- Section 1 of this report provides an introduction, including background, purpose of the SA Report and SA/SEA limitations;
- Section 2 presents the SA/SEA objectives to be used to assess the Minerals and Waste Local Plan Review and alternatives (SA/SEA Task A4);
- Section 3 presents the findings from the compatibility test between the Minerals and Waste Local Plan Review strategic objectives and the SA/SEA objectives (SA/SEA Task B1);
- Section 4 presents the details of the Minerals and Waste Local Plan Review strategic options considered (SA/SEA Task B2);
- Section 5 presents the results of the appraisal to predict the effects of the Minerals and Waste Local Plan Review (SA/SEA Task B3);
- Section 6 presents the evaluation of the effects of the Minerals and Waste Local Plan Review (SA/SEA Task B4);
- Section 7 presents the recommendations to mitigation adverse effects and maximise benefits of the Norfolk Minerals and Waste Local Plan Review (SA/SEA Task B5);
- Section 8 provides details of the proposed monitoring framework linked to specific indicators (SA/SEA Task B6).

Stage A of the SA/SEA Process "setting the context and objectives, establishing the baseline and deciding on the scope" is contained within the 'Initial Sustainability Appraisal Report - Part A Scoping' document, which is being published along with this document 'Initial Sustainability Appraisal - Part B', which contains stage B of the SA/SEA process.

### 1.6 Consultation

All information on the Initial consultation will be available on the County Council's website at www.norfolk.gov.uk/nmwdf (on the Minerals and Waste Local Plan Review page) and respondents will be able to make direct online responses.

The consultation documents will be available for public inspection, free of charge, within normal opening hours, at all public libraries in Norfolk and at:

- Norfolk County Council, County Hall, Martineau Lane, Norwich, NR1 2DH
- Breckland District Council, Elizabeth House, Walpole Loke, East Dereham, NR19 1EE
- Broadland District Council, Thorpe Lodge, Yarmouth Road, Norwich, NR7 0DU
- Great Yarmouth Borough Council, Town Hall, Great Yarmouth,NR30 2QF
- Borough Council of King's Lynn and West Norfolk, King's Court, Chapel Street, King's Lynn, PE30 1EX
- North Norfolk District Council, Holt Road, Cromer, NR27 9EN
- Norwich City Council, City Hall, Bethel Street, Norwich, NR2 1NH
- South Norfolk Council, South Norfolk House, Swan Lane, Long Stratton, NR15 2XE
- The Broads Authority, Yare House, 62-64 Thorpe Road, Norwich, Norfolk, NR1 1RY

The preferred method of submitting consultation responses is by using the County Council's online consultation system to make the comments directly at https://norfolk.jdi-consult.net/localplan/. However, emails and letters and also acceptable and the relevant contact details are as follows:

Post to: Planning Services, CES Department, Norfolk County Council, County Hall, Martineau Lane, Norwich, NR1 2DH

Email: LDF@norfolk.gov.uk

Please note that consultation responses cannot be treated as confidential and will be published on the consultation website.

## 2. Task A4: Scoring of SA Objectives

The following tables are also included in the 'Initial Sustainability Appraisal – Part A Scoping' as part of Task A4.

A range of factors are included in the scoring of the SA objectives, and the general considerations are listed in the following tables. There are two tables of SA Objectives, one for the assessment of specific sites and areas of search for mineral extraction and one for the assessment of planning policies in the Minerals and Waste Local Plan Review.

Table 1 details the factors that will be taken into account in assessing the proposed planning policies in the Minerals and Waste Local Plan Review. The planning policies cover: general issues relevant to both minerals and waste management developments, minerals specific policies and waste management specific policies. The Sustainability Appraisal assessments for the policies will be divided into three: short term, medium term and long term.

Table 2 details the factors that will be taken into account in assessing proposed specific site allocations and areas of search for mineral extraction in the Norfolk Minerals and Waste Local Plan Review. (This is not an exhaustive list – individual sites or areas of search may have individual elements to be taken into account).

By definition, minerals development is only a temporary use of land; all minerals planning permissions are time-limited. The Sustainability Appraisal assessments will therefore be divided into two: the operational stage (the development and operation of the site, which broadly covers the 'short' and 'medium' terms); and the restoration/post-restoration stage (which broadly covers the 'long' term).

**Table 1: SA scoring factors for the assessment of policies**

| SA Objective | Factors taken into account in scoring |
|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | ▪ Would implementation of the policy affect emissions to air from transport?<br>▪ Would implementation of the policy encourage energy efficient buildings and the provision of energy from renewable or low carbon sources? |
| SA2: To improve air quality in line with the National Air Quality Standards | ▪ Would implementation of the policy affect air quality generally? Would implementation of the policy affect any already-designated AQMA or potentially lead to the designation of a new AQMA? |
| SA3: To minimise noise, vibration and visual intrusion | ▪ Would implementation of the policy affect the amenity of residents? |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | ▪ Would implementation of the policy affect (social) accessibility and social exclusion? |
| SA5: To maintain and enhance the character of the townscape and historic environment | ▪ Would implementation of the policy affect local townscapes?<br>▪ Would implementation of the policy affect any Conservation Areas/listed buildings/Historic Parks & Gardens?<br>▪ Would implementation of the policy affect non-designated heritage assets?<br>▪ Would implementation of the policy affect any designated archaeological sites?<br>▪ Would implementation of the policy affect unknown archaeological sites?<br>▪ Would implementation of the policy potentially enable the discovery of new archaeological finds? |

| SA Objective | Factors taken into account in scoring |
|---|---|
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | • Would implementation of the policy affect designated ecological sites, or on species or habitats?<br>• Would implementation of the policy enhance biodiversity (e.g. creation of new target habitat on site restoration)?<br>• Would implementation of the policy affect geological/geomorphological assets? |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites [and waste management sites where applicable] | • Would implementation of the policy deliver any landscape/ ecological/ geological/ recreation / green infrastructure benefits on restoration instead of just restoration back to agricultural land? |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | • Would implementation of the policy affect the countryside and landscape, particularly designated landscape?<br>• Would implementation of the policy improve the quality of countryside and landscape? |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | • Would health and amenity (including impact on the amenity when walking on footpaths) of residents/ visitors be affected by implementation of the policy?<br>• Would implementation of the policy lead to any opportunities for 'gains' (e.g. new footpaths or public open space on restoration)? |
| SA10: To protect and enhance water and soil quality in Norfolk | ▪ Would implementation of the policy affect surface water and/or groundwater?<br>▪ Would implementation of the policy affect soils of 'best and most versatile' agricultural land (grades 1, 2 and 3a)? |
| SA11: To promote sustainable use of minerals and waste resources | ▪ Would implementation of the policy ensure that waste is managed as high up the waste hierarchy as practicable?<br>▪ Would implementation of the policy be in accordance with the proximity principle for waste?<br>▪ Would implementation of the policy affect the safeguarding of known mineral resources, mineral extraction sites and associated infrastructure?<br>▪ Would implementation of the policy affect the use of secondary and recycled aggregates?<br>▪ Would implementation of the policy provide a steady and adequate supply of aggregates and silica sand?<br>▪ Would implementation of the policy affect the highway network and road users? |
| SA12: To reduce the risk of current and future flooding at new and existing development | ▪ Would implementation of the policy affect flood risk at minerals or waste management sites, or increase flood risk elsewhere?<br>▪ Would implementation of the policy lead to the creation of additional flood storage capacity? |
| SA13: To encourage employment opportunities and promote economic growth | ▪ Would implementation of the policy provide new employment opportunities?<br>▪ Would implementation of the policy contribute to economic growth generally in Norfolk (e.g. by facilitating the development of new roads, houses etc)? |

**Table 2: SA scoring factors for the assessment of minerals sites and areas**

| SA Objective | Factors taken into account in scoring |
|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | ▪Distance from urban areas and main towns or (existing processing plant for silica sand) as a general proxy for $CO_2$ emissions: <5km ++; 5- 10km +; 10-15km 0; 15-20km -; >20km --<br>▪Would restoration include any areas of woodland which could act as a carbon sink? |
| SA2: To improve air quality in line with the National Air Quality Standards | ▪ Would working the site worsen air quality generally? Would it impact on any already-designated AQMA or potentially lead to the designation of a new AQMA? |
| SA3: To minimise noise, vibration and visual intrusion | ▪ Would the site be close enough to dwellings to impact adversely on the amenity of residents?<br>Sensitive receptors: over 250m 0, between 100 to 250m -, within 100m - - |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | ▪ Would working the site have any impact on (social) accessibility and social exclusion? |
| SA5: To maintain and enhance the character of the townscape and historic environment | ▪ Would working the site impact on local townscapes?<br>▪ Would working the site impact adversely on any Conservation Areas/listed buildings/Historic Parks & Gardens?<br>▪ Would working the site impact on non-designated heritage assets?<br>▪ Would working the site impact adversely on any designated archaeological sites?<br>▪ Would working the site potentially impact on unknown archaeological sites?<br>▪ Would working the site potentially enable the discovery of new archaeological finds?<br>Heritage assets: 0ver 500m 0, between 250m to 500m -, under 250m -- |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | • Would working the site impact adversely on designated ecological or geological/geomorphological sites (through damage), or on species or habitats?<br>• Would working the site allow access to useful geological/geomorphological assets?<br>• Would appropriate restoration offer opportunities for ecological gains? |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | • Would restoration deliver any landscape/ ecological/ geological/ recreation / green infrastructure benefits instead of just restoration back to agricultural land? |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | • Would working the site affect adversely the countryside and landscape, particularly designated landscape?<br>• Would restoration offer opportunities to improve the quality of countryside and landscape? |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | • Would health and amenity (including impact on the amenity when walking on footpaths) of residents/ visitors be affected?<br>• Would restoration offer any opportunities for 'gains' (e.g. new footpaths)? |

| SA Objective | Factors taken into account in scoring |
|---|---|
| SA10: To protect and enhance water and soil quality in Norfolk | ▪ Would surface water and/or groundwater quality be affected during the operational stage?<br>▪ Would previous land uses pose a risk to the water environment as a result of development on the site.<br>▪ Would soils of 'best and most versatile' soil quality (grades 1, 2 and 3a) be affected or lost? |
| SA11: To promote sustainable use of minerals resources | Distance from urban areas and main towns (or existing processing plant for silica sand) as a proxy for efficient use of mineral: <5km ++; 5- 10km +; 10-15km 0; 15-20km -; >20km -- |
| SA12: To reduce the risk of current and future flooding at new and existing development | ▪ Would the site be affected by flooding itself (noting that the NPPG classifies sand and gravel extraction as 'water compatible' development) or result in increased flood flows elsewhere?<br>▪ Would restoration involving the creation of water bodies provide additional flood storage capacity? |
| SA13: To encourage employment opportunities and promote economic growth | ▪ Would working the site provide new employment opportunities?<br>▪ Would working the site help contribute to economic growth generally in Norfolk (e.g. by facilitating the development of new roads, houses etc)? |

In the Minerals and Waste Local Plan Review each proposed policy, specific site and area of search will be assessed against each SA/SEA Objective to determine where they are likely to have a positive, neutral or negative effect. The strategic alternatives in the Minerals and Waste Local Plan Review will also be assessed against each SA/SEA Objective to determine where they are likely to have a positive, neutral or negative effect. The proposed strategic alternatives, specific sites and areas of search have been assessed according to short term, medium term and long term effects on the SA/SEA Objectives and will be scored against each SA Objective as follows:

| | |
|---|---|
| ++ | Significant positive effect |
| + | Positive effect |
| - | Negative effect |
| -- | Significant negative effect |
| 0 | No effect |
| +/- | Positive and negative effects |
| ? | Uncertain effect |

As well as primary sustainability effects, the assessment will also take into account secondary, tertiary, cumulative and synergistic effects in other areas.

## 3. Task B1: testing the Norfolk Minerals and Waste Local Plan Objectives against the SA/SEA Objectives

The draft Strategic Objectives for minerals and waste are contained in the Initial Consultation of the Minerals and Waste Local Plan Review and detailed in Table 3 below. The compatibility of these strategic objectives with the SA/SEA Objectives (which are detailed in Tables 1 and 2 of the previous section) have been assessed using a compatibility matrix as shown in Table 4.

**Table 3: Norfolk Minerals and Waste Local Plan Review Objectives**

| **Draft Waste Strategic Objectives** | |
|---|---|
| **WSO1** | Support the prevention and minimisation of waste generation in line with the Waste Hierarchy, and where waste cannot be avoided, maximise the recovery value from waste. |
| **WSO2** | To support an increase in the proportion and the quantity of waste that is re-used, recycled and recovered within Norfolk. |
| **WSO3** | To safeguard and encourage opportunities to enhance existing waste infrastructure which provide an important contribution to waste management at sites that serve Norfolk. |
| **WSO4** | To achieve net self-sufficiency in waste management by 2036, where practicable. |
| **WSO5** | To make provision to meet the need for new waste management facilities through the inclusion of 'criteria-based' locational policies. |
| **WSO6** | To support the reduction of greenhouse gas emissions, primarily by moving waste up the hierarchy to minimise the need for landfill and by minimising waste transport and distance by locating new waste facilities as close as practicable to the origin of the waste. |
| **WSO7** | To ensure waste facilities and their proposed locations are sustainably designed, constructed and operated to reduce potential adverse effects on human health, amenity and the natural, built and historic environment. |
| **WSO8** | Recognise the importance of the waste sector in the local economy as a generator of employment and its provision of infrastructure which supports businesses and communities. |
| **Draft Minerals Strategic Objectives** | |
| **MSO1** | To provide a steady and adequate supply of aggregate minerals by identifying adequate mineral extraction sites/areas within Norfolk sufficient to meet the requirements of the Local Aggregate Assessment and safeguarding existing infrastructure. |
| **MSO2** | To provide a steady and adequate supply of industrial minerals by identifying adequate mineral extraction sites/areas within Norfolk sufficient to meet the forecast need and safeguarding existing infrastructure. |
| **MSO3** | To encourage the sustainable use of minerals by utilising secondary and recycled aggregates which will reduce the reliance on primary won aggregates and safeguarding existing infrastructure. |
| **MSO4** | To safeguard silica sand, carstone, and sand and gravel resources for future use. Avoiding unnecessary sterilisation by encouraging the extraction of minerals prior to other development taking place where practicable and using minerals in construction on the land from which they are extracted. |
| **MSO5** | To promote the sustainable transport of minerals by rail, road and water, including the safeguarding of railheads and wharfs for the import of minerals to and export of minerals from Norfolk. |
| **MSO6** | To ensure the sustainable and expedient delivery of mineral extraction while protecting people from harm, positively contributing to the natural, built and historic environments and mitigating against adverse cumulative impacts. |
| **MSO7** | To ensure potential impacts on the amenity of those people living in proximity to minerals development are effectively controlled, minimised and mitigated. |

| | |
|---|---|
| **MSO8** | To ensure that mineral development addresses and minimises the impacts it will have on climate change by: minimising greenhouse gas emissions during the winning, working and handling of minerals, providing for sustainable patterns of minerals transportation, and integrating features consistent with climate change mitigation and adaption into the design of restoration and aftercare proposals. |
| **MSO9** | To positively contribute to the natural, built and historic environments with high quality, progressive and expedient restoration to achieve a beneficial after use. The after use will protect and enhance the environment, including landscape and biodiversity improvements. |
| **MSO10** | To increase public access to the countryside and enhance biodiversity through enhancing the amenity value of land when restoring extraction sites. |

**Table 4: Compatibility between SA/SEA Objectives and M&W LPR Objectives**

| | **Sustainability Appraisal Objectives** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** |
| **WSO1** | **+** | **+** | **+** | **0** | **0** | **0** | **0** | **0** | **0** | **+** | **+** | **0** | **+** |
| **WSO2** | **+** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **+** | **0** | **+** |
| **WSO3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **+/-** | **+** | **0** | **+** |
| **WSO4** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **+** | **0** | **+** |
| **WSO5** | **0** | **0** | **+** | **0** | **+** | **+** | **0** | **+** | **+** | **+** | **0** | **+** | **+** |
| **WSO6** | **+** | **+** | **+** | **0** | **0** | **+** | **0** | **0** | **+** | **0** | **+** | **0** | **+** |
| **WSO7** | **+** | **+** | **+** | **0** | **+** | **+** | **+** | **+** | **+** | **+** | **0** | **+** | **0** |
| **WSO8** | **0** | **0** | **0** | **+** | **0** | **0** | **0** | **0** | **0** | **0** | **+** | **0** | **+** |
| **MSO1** | **0** | **0** | **0** | **0** | **+** | **+/-** | **0** | **0** | **+/-** | **0** | **+** | **0** | **+** |
| **MSO2** | **0** | **0** | **0** | **0** | **+** | **+/-** | **0** | **0** | **+/-** | **0** | **+** | **0** | **+** |
| **MSO3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **+** | **0** | **0** | **+** | **0** | **+** |
| **MSO4** | **+** | **+** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **+** | **0** | **+** |
| **MSO5** | **+** | **+** | **+** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **+** | **0** | **0** |
| **MSO6** | **+** | **+** | **+** | **0** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **0** |
| **MSO7** | **+** | **+** | **+** | **0** | **0** | **0** | **0** | **0** | **+** | **0** | **+** | **0** | **0** |
| **MSO8** | **+** | **0** | **0** | **0** | **0** | **0** | **+** | **0** | **0** | **0** | **0** | **+** | **0** |
| **MSO9** | **0** | **0** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **0** | **0** | **+** | **+** |
| **MSO10** | **0** | **0** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **0** | **0** | **+** |

| **Key** | |
|---|---|
| **+** | Positive effect |
| **-** | Negative effect |
| **0** | No effect |
| **+/-** | Positive and negative effect |
| **?** | Uncertain effect |

In general, there is a high level of compatibility between the Minerals and Waste Local Plan Review objectives and the SA objectives; in that, if the objectives are met, they will have either a neutral or positive effect on meeting the Sustainability Appraisal objectives.

Objective MS01 has tensions with a couple of the SA objectives, because although aggregate minerals extraction may have impacts on the ecology of a site, it does provide positive opportunities for geological and archaeological investigations. Similar tensions exist for MS02 because this objective relates to the extraction of industrial minerals.

# 4. Task B2: Developing Strategic Options

## 4.1 Options development

The first stage in the Minerals and Waste Local Plan Review process was a 'call for mineral extraction sites' in July 2017. The first public consultation stage is the 'Initial Consultation'.

The subsequent stages in the M&WLPR will be consultation on the Preferred Options and a formal representations period on the Pre-Submission version of the M&WLPR.

The comments received in response to the Initial Consultation and the Preferred Options consultation will inform the Pre-Submission version of the M&WLPR.

Following a 'call for mineral extraction sites' in July 2017, the sites submitted have been subject to Sustainability Appraisal and all the submitted sites are contained in the Initial Consultation document as alternative options for mineral extraction during the Plan period. The site assessment tables are contained in Appendix B to this report.

The Initial Consultation document contains an assessment of each of the proposed sites and areas of search for future mineral extraction. These assessments include an initial conclusion regarding the suitability of the proposed specific sites and areas of search for inclusion in the M&WLPR for future mineral extraction.

Planning policies are also contained in the Initial Consultation document. The planning policies have been subject to Sustainability Appraisal and the policy assessment tables are contained in Appendix A to this report. Where there are alternative policy options, these alternatives have also been subject to Sustainability Appraisal, as detailed below and are being consulted on through the Initial Consultation stage. The policies where alternative options have been considered are:

WP1: Waste management capacity to be provided

WP2: Spatial strategy for waste management facilities

MP1: Provision for minerals extraction

MP2: Spatial Strategy for minerals extraction

These policies contain the quantity of minerals (MP1) and waste (WP1) to plan for and contain the spatial strategy for the location of mineral extraction sites (MP2) and waste management facilities (WP2).

## 4.2 Strategic Alternatives to Policy WP1: Waste management capacity to be provided

**Local Authority Collected Waste:**

An alternative option is to forecast Local Authority Collected Waste based on past household growth which results in a growth rate of over 1.5% per annum, instead of the growth rate of 0.97% per annum (based on the Norfolk SHMAs) used in Policy WP1.

OR

Forecast Local Authority Collected Waste based on the ONS prediction of 0.88% per annum, instead of the growth rate of 0.97% per annum (based on the Norfolk SHMAs) used in Policy WP1.

**Commercial and Industrial Waste:**

An alternative option is to forecast C&I waste growth over the Plan period at 1.4% per annum instead of 1.5% per annum used in Policy WP1.

Due to any potential effects on SA objectives depending upon the location and type of facilities required, the alternative options for forecasting waste growth will not affect the results of the SA for Policy WP1, which is detailed on the following page.

**Policy WP1: Waste management capacity to be provided**

| SA Objective | Assessment of effects | | | Comments |
|---|---|---|---|---|
| | Short term | Medium term | Long term | |
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0 | 0 | No direct effects from this policy which contains the quantum of waste that is forecast to need to be managed over the plan period. Effects will depend upon the location and type of new facilities. Applications for new facilities will be determined in accordance with the relevant policy for the facility type. Each policy has been assessed separately in the SA. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0 | 0 | As above |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 | 0 | As above |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 | 0 | As above |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0 | 0 | As above |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0 | 0 | As above |
| SA7: To promote innovative solutions for the restoration and after use of minerals or waste sites | 0 | 0 | 0 | No effect |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0 | 0 | No direct effects from this policy which contains the quantum of waste that is forecast to need to be managed over the plan period. Effects will depend upon the location and type of new facilities. Applications for new facilities will be determined in accordance with the |

| SA Objective | Assessment of effects | | | Comments |
|---|---|---|---|---|
| | Short term | Medium term | Long term | |
| | | | | relevant policy for the facility type. Each policy has been assessed separately in the SA. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 | 0 | As above |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0 | 0 | As above |
| SA11: To promote sustainable use of minerals and waste resources | + | + | + | The policy states that provision will be made to manage the forecast quantities of waste. New facilities or changes to existing facilities which help to achieve the targets for recycling, composting, reuse and recovery set out in the Waste Management Plan for England will be encourage. Therefore this policy will promote sustainable use of waste resources. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0 | 0 | No direct effects from this policy which contains the quantum of waste that is forecast to need to be managed over the plan period. Effects will depend upon the location of new facilities. Applications for new facilities will be determined in accordance with the relevant policy for the facility type. Each policy has been assessed separately in the SA. |
| SA13: To encourage employment opportunities and promote economic growth | + | + | + | This policy to provide sufficient waste management capacity to meet the expected arisings will encourage employment opportunities and promote economic growth, through the provision of infrastructure to support businesses and the community. |
| **Conclusion** | This policy is not expected to have any direct effects on the majority of the SA objectives because effects will depend upon the location and type of new waste management facilities, which will be determined in accordance with the relevant policy for the facility type. This policy scores positively for sustainable use of waste resources and promoting economic growth through the provision of waste management facilities to manage the forecast waste arisings. No changes or mitigation measures are recommended to this policy. | | | |

### 4.3 Strategic Alternatives to Policy WP2: Spatial strategy for waste management facilities

The following table assesses the policy wording contained in the Initial Consultation document:

| SA Objective | Assessment of effects | | | Comments |
|---|---|---|---|---|
| | Short term | Medium term | Long term | |
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | + | + | + | The policy states that most types of waste management facilities should be located within five miles of at least one of Norfolk's urban areas or main towns. Some facility types will be acceptable in other locations that are close to the source of waste or the destination of the recovered waste material. These requirements are expected to limit the distance that waste will be transported to and from facilities and the associated emissions to air from road transport, which should reduce contributions to climate change. |
| SA2: To improve air quality in line with the National Air Quality Standards | + | + | + | The policy states that most types of waste management facilities should be located within five miles of at least one of Norfolk's urban areas or main towns. Some facility types will be acceptable in other locations that are close to the source of waste or the destination of the recovered waste material. These requirements are expected to limit the distance that waste will be transported to and from facilities and the associated emissions to air from road transport. Local effects will depend upon the location of new facilities. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 | 0 | The purpose of the policy is to locate waste management facilities close to the source of waste or the destination of the recovered waste material. This policy is expected to have a neutral effect on noise, vibration and visual intrusion because local effects will depend upon the specific location of new facilities in relation to sensitive receptors to amenity impacts. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | + | + | + | The policy states that most waste management facilities should be located within five miles of at least one of Norfolk's urban areas or main towns. This spatial strategy should improve accessibility to waste management services. |
| SA5: To maintain and enhance the character of the townscape and | 0 | 0 | 0 | There are heritage assets located within five miles of Norfolk's urban areas and main towns. There are also heritage assets located at greater distances from Norfolk's urban areas and main towns. |

| SA Objective | Assessment of effects | | | Comments |
|---|---|---|---|---|
| | Short term | Medium term | Long term | |
| historic environment | | | | The spatial strategy in this policy is therefore expected to have a neutral effect on the character of the townscape and historic environment. Local effects will depend upon the specific location of new facilities. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0 | 0 | There are designated sites for biodiversity and also locations of geodiversity priority features within five miles of Norfolk's urban areas and main towns. There are also designated sites for biodiversity and locations of geodiversity priority features at greater distances from Norfolk's urban areas and main towns. The spatial strategy in this policy is therefore expected to have a neutral effect on biodiversity and geodiversity. Local effects will depend upon the specific location of new facilities. |
| SA7: To promote innovative solutions for the restoration and after use of minerals or waste sites | 0 | 0 | 0 | No effect |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0 | 0 | There are areas of protected landscapes (such as AONB, the Broads and Conservation Areas) and areas of countryside within five miles of some of Norfolk's urban areas and main towns. There are also areas of protected landscapes and areas of countryside at greater distances of Norfolk's urban areas and main towns. The spatial strategy in this policy is therefore expected to have a neutral effect on the quality and distinctiveness of the countryside and landscape. Local effects will depend upon the specific location of new facilities. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 | 0 | The purpose of the policy is to locate waste management facilities close to the source of waste or the destination of the recovered waste material. This policy is expected to have a neutral effect on the health and amenity of local communities because local effects will depend upon the specific location of new facilities in relation to sensitive receptors to health and amenity impacts. |
| SA10: To protect and enhance water | 0 | 0 | 0 | There are areas of BMV agricultural land and areas of poor quality agricultural land |

| SA Objective | Assessment of effects | | | Comments |
|---|---|---|---|---|
| | Short term | Medium term | Long term | |
| and soil quality in Norfolk | | | | within five miles of Norfolk's urban areas and main towns. There are also areas of BMV agricultural land at greater distances from Norfolk's urban areas and main towns. The spatial strategy in this policy is therefore expected to have a neutral effect on soil quality. The spatial strategy in this policy is also expected to have a neutral effect on water quality. Local effects will depend upon the specific location of new facilities. |
| SA11: To promote sustainable use of minerals and waste resources | + | + | + | This policy states that most types of waste management facilities should be located within five miles of at least one of Norfolk's urban areas or main towns. Some facility types will be acceptable in other locations that are close to the source of waste or the destination of the recovered waste material. These requirements are expected to ensure that waste management facilities are developed in sustainable locations in transport terms. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0 | 0 | There are areas at high risk and areas at low risk of flooding within five miles of Norfolk's urban areas and main towns. There are also areas at high risk of flooding at greater distances of Norfolk's urban areas and main towns. The spatial strategy in this policy is therefore expected to have a neutral effect on flood risk. Local effects will depend upon the specific location of new facilities. |
| SA13: To encourage employment opportunities and promote economic growth | + | + | + | The spatial strategy to locate waste management facilities close to the source of the waste or the destination of the recovered waste material should provide this infrastructure in suitable locations to support economic growth in other sectors. New waste management facilities may also increase employment levels slightly. |
| **Conclusion** | The policy is assessed as having a positive effect for five of the SA objectives due to the policy aim to locate waste management facilities close to the source of the waste or the destination of the recovered waste material. The policy scores neutrally for all other SA objectives because it is not considered that locating facilities within 5 miles of one of Norfolk's urban areas or main towns would have a particular effect on these objectives, compared to locating facilities nearer or further from Norfolk's urban areas or main towns.<br>No changes or mitigation measures are recommended to this policy. | | | |

**Alternative options to Policy WP2:**

Policy WP2 (as assessed in the previous table) states that most types of waste management facilities should be located within 5 miles of at least one of Norfolk's urban areas or main towns. This is because these centres of population and employment are expected to be the main source of waste arisings in Norfolk and/or the destination of the recovered waste material. Some facility types will be acceptable in other locations that are close to the source of the waste or the destination of the recovered waste material.

The settlement hierarchy is defined by the Local Planning Authorities in Norfolk. The urban areas and main towns are as follows:

Urban Areas: Norwich, King's Lynn (including West Lynn), Thetford, Attleborough, Great Yarmouth and Gorleston-on-Sea.

The Norwich urban area includes the built-up parts of the urban fringe parishes of Colney, Costessey, Cringleford, Trowse, Thorpe St Andrew, Sprowston, Old Catton, Hellesdon, Drayton and Taverham.

Main Towns: Aylsham, Cromer, Dereham, Diss, Downham Market, Fakenham, Harleston, Holt, Hunstanton, North Walsham, Swaffham, Watton, Wymondham.

Alternative options to Policy WP2 are as follows:

1. Include settlements at a lower tier of the settlement hierarchy - Key Service Centres
2. Increase the distance at which waste management facilities could be located from urban areas or main towns, from 5 miles to 10 miles
3. Different locational criteria depending on the throughput of a site – sites over 75,000 tonnes per annum (tpa) within 10 miles of an urban area, smaller facilities within 10 miles of an urban area or main town.

The table below assesses Policy WP2 (5 miles from an urban area or main town) against each of the Sustainability Appraisal objectives, and compares its effects to the effects of the three alternative options.

| SA Objective | Assessment of effects of options | | | | Comments |
|---|---|---|---|---|---|
| | 5 miles from an urban area or main town | Include 5 miles from a KSC | 10 miles from an urban area or main town | Distance varies by site size in tpa | |
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | + | - | - | - | Locating waste management facilities within 5 miles of an urban area or main town should limit the distance that waste will be transported to and from facilities and the associated emissions to air from road transport, which should reduce contributions to climate change. Locating facilities within 10 miles of an urban area or main town would have less effect on reducing transport and associated emissions. Locating large facilities 10 miles from an urban area and all other |

| SA Objective | Assessment of effects of options | | | | Comments |
|---|---|---|---|---|---|
| | 5 miles from an urban area or main town | Include 5 miles from a KSC | 10 miles from an urban area or main town | Distance varies by site size in tpa | |
| | | | | | facilities within 10 miles of an urban area or main town would also have less effect on reducing transport and associated emissions.<br>Locating facilities within 5 miles of an urban area, main town or KSC may mean that facilities are located near settlements with a smaller population, instead of larger centres of population, and therefore have less effect on reducing transport and associated emissions. |
| SA2: To improve air quality in line with the National Air Quality Standards | + | - | - | - | Locating waste management facilities within 5 miles of an urban area or main town should limit the distance that waste will be transported to and from facilities and the associated emissions to air from road transport.<br>Locating facilities within 10 miles of an urban area or main town would have less effect on reducing transport and associated emissions.<br>Locating large facilities 10 miles from an urban area and all other facilities within 10 miles of an urban area or main town would also have less effect on reducing transport and associated emissions.<br>Locating facilities within 5 miles of an urban area, main town or KSC may mean that facilities are located near settlements with a smaller population, instead of larger centres of population, and therefore have less effect on reducing transport and associated emissions. Local effects will depend upon the location of new facilities. |

| SA Objective | Assessment of effects of options | | | | Comments |
|---|---|---|---|---|---|
| | 5 miles from an urban area or main town | Include 5 miles from a KSC | 10 miles from an urban area or main town | Distance varies by site size in tpa | |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 | 0 | 0 | Each policy option is expected to have a neutral effect on noise, vibration and visual intrusion because local effects will depend upon the specific location of new facilities in relation to sensitive receptors to amenity impacts. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | + | - | - | - | Accessibility to waste management services may be improved if facilities should be within 5 miles of an urban area or main town.<br>Locating facilities within 10 miles of an urban area or main town would be less accessible than 5 miles.<br>Locating large facilities 10 miles from an urban area and all other facilities within 10 miles of an urban area of main town would also be less accessible than 5 miles.<br>Locating facilities within 5 miles of an urban area, main town or KSC may mean that facilities are located near to settlements with a smaller population, instead of larger centres of population, making them not as accessible to the majority of people. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0 | 0 | 0 | There are heritage assets located within five miles of Norfolk's urban areas, main towns and KSCs. There are also heritage assets located at greater distances from Norfolk's urban areas and main towns. The spatial strategies in these policy options are therefore expected to have a neutral effect on the character of the townscape and historic environment. Local effects will depend upon the specific location of new facilities. |
| SA6: To protect and enhance Norfolk's | 0 | 0 | 0 | 0 | There are designated sites for biodiversity and also locations of geodiversity priority features |

| SA Objective | Assessment of effects of options | | | | Comments |
|---|---|---|---|---|---|
| | 5 miles from an urban area or main town | Include 5 miles from a KSC | 10 miles from an urban area or main town | Distance varies by site size in tpa | |
| biodiversity and geodiversity | | | | | within five miles of Norfolk's urban areas, main towns and KSCs. There are also designated sites for biodiversity and locations of geodiversity priority features at greater distances from Norfolk's urban areas and main towns. The spatial strategies in these policy options are therefore expected to have a neutral effect on biodiversity and geodiversity. Local effects will depend upon the specific location of new facilities. |
| SA7: To promote innovative solutions for the restoration and after use of minerals or waste sites | 0 | 0 | 0 | 0 | No effect |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0 | 0 | 0 | There are areas of protected landscapes (such as AONB, the Broads and Conservation Areas) and areas of countryside within five miles of some of Norfolk's urban areas, main towns and KSCs. There are also areas of protected landscapes and areas of countryside at greater distances of Norfolk's urban areas and main towns. The spatial strategies in these policy options are therefore expected to have a neutral effect on the quality and distinctiveness of the countryside and landscape. Local effects will depend upon the specific location of new facilities. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 | 0 | 0 | Each policy option is expected to have a neutral effect on the health and amenity of local communities because local effects will depend upon the specific location of new facilities in relation to sensitive |

| SA Objective | Assessment of effects of options | | | | Comments |
|---|---|---|---|---|---|
| | 5 miles from an urban area or main town | Include 5 miles from a KSC | 10 miles from an urban area or main town | Distance varies by site size in tpa | |
| | | | | | receptors to health and amenity impacts. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0 | 0 | 0 | There are areas of BMV agricultural land and areas of poor quality agricultural land within five miles of Norfolk's urban areas, main towns and KSCs. There are also areas of BMV agricultural land at greater distances from Norfolk's urban areas and main towns. The spatial strategies in these policy options are therefore expected to have a neutral effect on soil quality. The spatial strategy in this policy is also expected to have a neutral effect on water quality. Local effects will depend upon the specific location of new facilities. |
| SA11: To promote sustainable use of minerals and waste resources | + | - | - | - | Locating waste management facilities in a sustainable location in transport terms means locating facilities close to the source of the waste or the destination of the recovered waste material. Locating facilities within 5 miles of an urban area or main town should ensure that facilities are developed in sustainable locations in transport terms. Locating facilities within 10 miles of an urban area or main town may enable facilities to be developed in less sustainable locations in transport terms. Locating large facilities 10 miles from an urban area and all other facilities within 10 miles of an urban area or main town may enable facilities to be developed in less sustainable locations in transport terms. Locating facilities within 5 miles of an urban area, main town or KSC may mean that facilities are located near settlements with a |

| SA Objective | Assessment of effects of options | | | | Comments |
|---|---|---|---|---|---|
| | 5 miles from an urban area or main town | Include 5 miles from a KSC | 10 miles from an urban area or main town | Distance varies by site size in tpa | |
| | | | | | smaller population, instead of larger centres of population, which would be less sustainable in transport terms. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0 | 0 | 0 | There are areas at high risk and areas at low risk of flooding within five miles of Norfolk's urban areas, main towns and KSCs. There are also areas at high risk of flooding at greater distances of Norfolk's urban areas and main towns. The spatial strategies in these policy options are therefore expected to have a neutral effect on flood risk. Local effects will depend upon the specific location of new facilities. |
| SA13: To encourage employment opportunities and promote economic growth | + | - | - | - | To support economic growth in other sectors waste management facilities should be located close to the source of the waste or the destination of the recovered material. New waste facilities may also increase employment levels slightly. Locating facilities within 5 miles of an urban area or main town should ensure that facilities are developed in suitable locations to support economic growth.<br>Locating facilities within 10 miles of an urban area or main town may mean that they are located in less suitable locations to support economic growth.<br>Locating large facilities 10 miles from an urban area and all other facilities within 10 miles of an urban area or main town may also mean they are located in less suitable locations to support economic growth.<br>Locating facilities within 5 miles of an urban area, main town or KSC may mean that facilities are located near settlements with a |

| SA Objective | Assessment of effects of options | | | | Comments |
|---|---|---|---|---|---|
| | 5 miles from an urban area or main town | Include 5 miles from a KSC | 10 miles from an urban area or main town | Distance varies by site size in tpa | |
| | | | | | smaller population, instead of larger centres of population, and therefore are located in less suitable locations to support economic growth. |
| **Conclusion** | The policy option to located facilities within five miles of one of Norfolk's urban areas or main towns is assessed as having a positive effect for five of the SA objectives due to the policy aim to locate waste management facilities close to the source of the waste or the destination of the recovered waste material. The alternative policy options score negatively for the same five SA objectives. This is due to two of the alternative policy options enabling facilities to be located further away from the urban areas and main towns (10 miles instead of five miles) leading to increased transport of waste and associated impacts; whilst the third alternative policy option enables facilities to be located near Key Service Centres with a smaller population, instead of focussing development near to larger centres of population. Therefore the option to include KSCs is also expected to lead to increased transport of waste and associated impacts.<br>All the policy options score neutrally for all other SA objectives because it is not considered that options for locating facilities at different distances from one of Norfolk's urban areas, main towns or Key Service Centres would have a particular effect on these objectives.<br>Therefore it is concluded that the original policy option of locating the majority of waste management facility types within 5 miles of an urban area or main town is the most sustainable option. | | | | |

### 4.4 Strategic Alternatives to Policy MP1: Provision for minerals Extraction

Policy MP1 uses the average production figures for the last twenty years to forecast the quantities of sand and gravel (1,980,000 tpa) and carstone (126,500 tpa) to be planned for. This results in a need to allocate specific sites to deliver at least 23,063,560 tonnes of sand and gravel, and 480,000 tonnes of carstone over the Plan period.

| SA Objective | Assessment of effects | | | Comments |
|---|---|---|---|---|
| | Short term | Medium term | Long term | |
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0 | 0 | No direct effects from this policy which contains the quantum of minerals that are forecast to be needed over the plan period. Effects will depend upon the location of new mineral extraction sites. Applications for new sites will be determined in accordance with the relevant policy for the allocated site. Each proposed extraction site has been assessed separately in the SA. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0 | 0 | As above |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 | 0 | As above |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 | 0 | As above |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0 | 0 | As above |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0 | 0 | As above |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0 | 0 | No effect |
| SA8: To protect and enhance the quality and | 0 | 0 | 0 | No direct effects from this policy which contains the quantum of minerals that are forecast to be needed over the plan |

| SA Objective | Assessment of effects | | | Comments |
|---|---|---|---|---|
| | Short term | Medium term | Long term | |
| distinctiveness of the countryside and landscape | | | | period. Effects will depend upon the location of new mineral extraction sites. Applications for new sites will be determined in accordance with the relevant policy for the allocated site. Each proposed extraction site has been assessed separately in the SA. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 | 0 | As above |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0 | 0 | As above |
| SA11: To promote sustainable use of minerals and waste resources | + | + | + | This policy states that sufficient sites will be allocated to meet the forecast need for sand and gravel and carstone, whilst sufficient sites/and or areas will be allocated to meet the forecast need for silica sand. Therefore it is considered that allocating sites or areas to meet the quantities of aggregates and silica sand forecast to be needed over the plan will enable a steady and adequate supply of aggregates and industrial minerals to be provided. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0 | 0 | No direct effects from this policy which contains the quantum of minerals that are forecast to be needed over the plan period. Effects will depend upon the location of new mineral extraction sites. Applications for new sites will be determined in accordance with the relevant policy for the allocated site. Each proposed extraction site has been assessed separately in the SA. |
| SA13: To encourage employment opportunities and promote economic growth | + | + | + | This policy is to provide a steady and adequate supply of minerals to meet the forecast need. This will enable the minerals industry to contribute to the economy as an employer and to provide sufficient raw materials for the construction of buildings and roads and for glass manufacture to promote economic growth. |
| **Conclusion** | This policy is not expected to have any direct effects on the majority of the SA objectives because effects will depend upon the location of new mineral extraction sites, which will be determined in accordance with the relevant policy for the allocated site. This policy scores positively for | | | |

| SA Objective | Assessment of effects | | | Comments |
|---|---|---|---|---|
| | Short term | Medium term | Long term | |
| | sustainable use of mineral resources and promoting economic growth through the provision of a steady and adequate supply of mineral resources. No changes or mitigation measures are recommended to this policy. | | | |

**Alternative options to Policy MP1:**

1. Use the **average production figures for the last ten years** to forecast the quantities of sand and gravel (1,406,800 tpa) and carstone (98,840 tpa) to be planned for. This would result in a lower quantity to plan for and a need to allocate specific sites to deliver at least 16,536,400 tonnes of sand and gravel, but no sites for carstone would need to be allocated over the Plan period.
2. Use the **sub-national guidelines** to forecast the quantity of sand and gravel (2,570,000 tpa) and carstone (200,000 tpa) to plan for. This would result in a higher quantity to plan for and a need to allocate specific sites to deliver at least 39,800,400 tonnes of sand and gravel, and 1,950,000 tonnes of carstone over the Plan period.

Due to mineral extraction sites varying in depth and quality of mineral resource, it is not possible to directly relate how many sand and gravel sites would be required to provide the tonnages forecast using the alternative policy options. Site proposed for sand and gravel extraction in the M&WLPR vary in the estimated resource from 160,000 tonnes to 4,500,000 tonnes. The mean average quantity in a proposed site is 948,854 tonnes per site, however, the median quantity in a proposed site is only 650,000 tonnes.

For carstone only one specific site has been proposed. Using the average production figures for the last twenty years, one site for carstone would need to be allocated. Using the sub-national guidelines, two sites for carstone would need to be allocated, whilst using the average production figures for the last ten years, no carstone sites would need to be allocated due to sufficient reserve in the existing permitted sites.

The following table compares impacts for the three policy options, for the quantities of sand and gravel, and carstone minerals to be planned for, against each Sustainability Appraisal objective.

| SA Objective | Assessment of effects of options | | | Comments |
|---|---|---|---|---|
| | 20 year average forecast | 10 year average forecast | sub-national guidelines forecast | |
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0 | 0 | No direct effects from the policy options which contain different forecasts for the quantum of minerals needed over the plan period. Effects will depend upon the location of new mineral extraction sites. Applications for new sites will be determined in accordance with the relevant policy for the allocated site. Each proposed extraction site has been assessed separately in the SA. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0 | 0 | As above |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 | 0 | As above |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 | 0 | As above |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0 | 0 | As above |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0 | 0 | As above |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0 | 0 | No effect |
| SA8: To protect and enhance the quality and | 0 | 0 | - | No direct effects from the two alternative policy options which forecast the quantum of minerals |

| SA Objective | Assessment of effects of options | | | Comments |
|---|---|---|---|---|
| | 20 year average forecast | 10 year average forecast | sub-national guidelines forecast | |
| distinctiveness of the countryside and landscape | | | | needed over the plan period using the 10 year and 20 year average production figures.<br>Using the sub-national apportionment for sand and gravel would plan for too much mineral because the sub-national apportionment has not been met in the last 10 years. Therefore this option could have a negative effect on the countryside if more sites are developed than are needed it will take longer for sites to be worked and restored because the supply will exceed the demand.<br>Effects will depend upon the location of new mineral extraction sites. Applications for new sites will be determined in accordance with the relevant policy for the allocated site. Each proposed extraction site has been assessed separately in the SA. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 | 0 | As above |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0 | 0 | As above |
| SA11: To promote sustainable use of minerals and waste resources | + | - | - | Using the 20 year production average will enable a steady and adequate supply of minerals to be provided because it includes a full economic cycle of construction and mineral extraction (both growth and recession).<br>Using the 10 year production average may lead to an insufficient supply of minerals to be provided because the last 10 years has included an economic recession where less construction took place and therefore less mineral was extraction.<br>Using the sub-national apportionment would plan for too much mineral because the sub-national apportionment for sand and gravel has not been met in the last 10 years. |

| SA Objective | Assessment of effects of options | | | Comments |
|---|---|---|---|---|
| | 20 year average forecast | 10 year average forecast | sub-national guidelines forecast | |
| | | | | Therefore this is not considered to be promote a sustainable use of minerals. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0 | 0 | No direct effects from the policy options which contain different forecasts for the quantum of minerals needed over the plan period. Effects will depend upon the location of new mineral extraction sites. Applications for new sites will be determined in accordance with the relevant policy for the allocated site. Each proposed extraction site has been assessed separately in the SA. |
| SA13: To encourage employment opportunities and promote economic growth | + | - | + | Using the 20 year production average will enable a steady and adequate supply of minerals to be provided because it includes a full economic cycle of construction and mineral extraction (both growth and recession). This will enable the minerals industry to contribute to the economy as an employer and to provide sufficient raw materials for the construction of buildings and roads to promote economic growth.<br>Using the 10 year production average may lead to an insufficient supply of minerals to be provided to promote economic growth because the last 10 years has included an economic recession where less construction took place and therefore less mineral was extracted.<br>Using the sub-national apportionment would plan for too much mineral because the sub-national apportionment for sand and gravel has not been met in the last 10 years. However, this would still enable the minerals industry to provide sufficient raw materials for construction to promote economic growth. |
| **Conclusion** | The alternative policy options are not expected to have any direct effects on the majority of the SA objectives [SA1, SA2, SA3, SA4, SA5, SA6, SA7, SA9, SA10] because effects will depend upon the location of new mineral extraction sites. Using the sub-national apportionment is expected to have a negative impact on the countryside (SA8) because an over-supply of sites will take longer to work and restore. Using the 10 | | | |

| SA Objective | Assessment of effects of options | | | Comments |
|---|---|---|---|---|
| | 20 year average forecast | 10 year average forecast | sub-national guidelines forecast | |
| | year average production scores negatively for SA11 and SA13 because it may lead to an insufficient supply of minerals. Using the 20 year average production scores positively for SA11 and SA13 because it would lead to the provision of a steady and adequate supply of mineral resources. Using the sub-national guidelines scores positively for SA13 because an oversupply of mineral would still promote economic growth, but negatively for SA11 because an over-supply is not considered to be a sustainable use of minerals. Therefore it is concluded that the original policy option of using the 20 year production average to forecast the need for sand and gravel and carstone is the most sustainable option. | | | |

### 4.5 Strategic Alternatives to Policy MP2: Spatial Strategy for Minerals Extraction

The following strategic options were considered for defining areas of search for future silica sand extraction:

- Should areas of search exclude land within 2km of Roydon Common and Dersingham Bog SAC, or should a different distance be used?
- Should areas of search exclude land within 250 metres of The Wash SPA, The Wash Ramsar and The Wash and North Norfolk Coast SAC, or should a different distance be used?
- Should areas of search exclude land within 250 metres of SSSIs or should a different distance be used?
- Should areas of search exclude land within 15 metres of ancient woodland or should a different distance from these sites be used?
- Should areas of search exclude land within 250 metres of designated heritage assets or should a different distance from these sites be used?
- Should areas of search exclude land within 5km of the Norfolk Coast Area of Outstanding Natural Beauty or only exclude land within the AONB?
- Should areas of search exclude land within 125 metres of sensitive receptors for amenity impacts, or should a different distance be used?
- Should areas of search exclude allocated sites and sites with planning permission for non-mineral uses that are located in or adjacent to the silica sand resource, or include this land?
- Should areas of search exclude agricultural land grades 1, 2 and 3 or only exclude land grades 1 and 2?
- Should areas of search exclude land in flood zones 2 and 3, or include this land?
- Should areas of search only include the silica sand resource within the Leziate beds or should the whole silica sand resource, as mapped by the BGS, be included?
- Should an area of search be at least 20 hectares in area, or should all areas of search be considered?

These strategic options were consulted on in the 'Initial Consultation' on the Single Issue Silica Sand Review of the Minerals Site Specific Allocations DPD, which took place in March and April 2015. The Single Issue Silica Sand Review was subsequently found to be 'sound' and legally compliant by an independent Planning Inspector, following an examination in public, and adopted by Norfolk County Council in December 2017.

The Initial Consultation on the M&WLPR includes the methodology used to define areas of search for silica sand extraction within Policy MP2. Therefore, the strategic alternatives to the methodology are included in this sustainability appraisal. The sustainability appraisal of the complete Policy MP2 is included in Appendix A to this report.

The following tables compare the impacts against each sustainability appraisal objective for the two alternative options for dealing with each planning constraint when defining areas of search for future silica sand extraction.

The sustainability impacts have been assessed in a comparative way for the alternative options to dealing with each planning constraint. Therefore the first option for each constraint is assessed as a baseline and scored as neutral against each sustainability appraisal objective and the alternative option is assessed in comparison to it. Therefore the alternative option will be assessed as either having the same effect, or a more positive or more negative effect than the first option for each of the sustainability appraisal objectives.

**Should areas of search exclude land within 2km of Roydon Common and Dersingham Bog SAC, or should a different distance be used?**

| SA Objective | Exclude land within 2km of Roydon Common and Dersingham Bog SAC (the baseline option) | Exclude land within the hydrological catchments of Roydon Common and Dersingham Bog SAC |
|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | -<br>Due to the area of land involved, excluding land within the catchment of Roydon Common and Dersingham Bog could increase transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate because it would remove some potential areas closer to the processing plant. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0<br>No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected as potential transport routes do not pass through the AQMAs. There is the potential for an increase in transport distances between areas of search and the existing processing plant at Leziate because some potential areas within the catchment have been removed. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0<br>No difference between the options is expected. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0<br>No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0<br>No difference between the options is expected, excluding land based on hydrological catchments would not result in significant additional areas of the historic environment being included or excluded.<br>Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | +<br>Excluding land based on hydrological catchment would reduce the risk of impacts from extraction on water dependent biodiversity features within the catchment. |
| SA7: To promote innovative solutions for the restoration and after e of minerals sites | 0 | 0<br>No difference between the options is expected. |
| SA8: To protect and enhance the quality and | 0 | 0 |

| SA Objective | Exclude land within 2km of Roydon Common and Dersingham Bog SAC (the baseline option) | Exclude land within the hydrological catchments of Roydon Common and Dersingham Bog SAC |
|---|---|---|
| distinctiveness of the countryside and landscape | | No difference between the options is expected. Excluding land based on hydrological catchments would not result in significant additional areas of high landscape value being included or excluded. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0<br>No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0<br>There are no groundwater source protection zones within the silica sand resource.<br>Surface water quality is not expected to be effected by these options. No difference between the options is expected. Excluding land based on hydrological catchments would not result in significant additional areas of higher quality agricultural land being included or excluded. |
| SA11: To promote sustainable use of minerals resources | 0 | -<br>Excluding land within the hydrological catchment of Roydon Common and Dersingham Bog reduces the area of land available to be considered for an area of search because the catchment covers a greater area than a 2km buffer. This provides fewer options for future locations of silica sand extraction. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0<br>No difference between the options is expected. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | -<br>Excluding land within the hydrological catchment of Roydon Common and Dersingham Bog reduces the area of land available to be considered for an area of search closest to the existing processing plant. This provides fewer options for future locations of silica sand extraction.<br>There is the potential for an increase in transport distances between areas of search and the existing processing plant at Leziate because some potential areas within the catchment have been removed |
| **Conclusion** | There are no differences between the options for the majority of the sustainability indicators. This is mainly due to the difference in land area between excluding land based on a 2km buffer or based on hydrological catchments around Roydon Common and Dersingham Bog SAC and the location of constraints in relation to these distances. There would be a positive effect on biodiversity by excluding land based on hydrological | |

| SA Objective | Exclude land within 2km of Roydon Common and Dersingham Bog SAC (the baseline option) | Exclude land within the hydrological catchments of Roydon Common and Dersingham Bog SAC |
|---|---|---|
| | catchments because it would remove land where the potential to impact on water dependent features is higher.<br>The potential negative effects are that removing a larger area of land from consideration reduces the options available for future locations of silica sand extraction closest to the Leziate. This might result in greater transport distances to the processing plant. However, overall it is considered that excluding land based on hydrological catchments from an area of search is considered to be an acceptable approach due to the international importance of Roydon Common and Dersingham Bog. | |

**Should areas of search exclude land within 250 metres of The Wash SPA, The Wash Ramsar and The Wash and North Norfolk Coast SAC, or should a different distance be used?**

| SA Objective | Exclude land within 250m of The Wash (the baseline option) | Exclude land within 1km of The Wash |
|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0<br>No difference between the options is expected. There would not be any difference to transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0<br>No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected. There would not be any difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0<br>No difference between the options is expected. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0<br>No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0<br>No difference between the options is expected because no historic assets would be excluded by using a 1km buffer from The Wash.<br>Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0/+<br>No difference between the options is expected regarding geodiversity.<br>There are County Wildlife Sites both within 250m and 1km of The Wash. The main issue raised by Natural England regarding potential impacts on The Wash is disturbance to birds from noise and lighting. Normal practice is for silica sand extraction sites to not have artificial lighting as all processing takes place at Leziate. It would be possible to require this by a planning condition. Due to the scale and operation of silica sand extraction sites, it is considered that the noise from machinery used to dig the silica sand would cause no more disturbances at 250 metres than 1km. It is also possible to control noise levels by a planning condition.<br>There is the potential that mineral extraction within 250 or 1km of The Wash would affect functional |

| SA Objective | Exclude land within 250m of The Wash (the baseline option) | Exclude land within 1km of The Wash |
|---|---|---|
| | | habitat used by the designated bird species of The Wash for foraging. Excluding land within 1km of The Wash would be expected to reduce the area of functional habitat that could potentially be affected. However, either option may not exclude functional habitat for The Wash as bird species may forage further inland.<br>Restoration options for silica sand extraction, for example to deliver ecological benefits, would not be affected by whether or not land within 1km of The Wash is excluded from an area of search. It is however, considered that there could be positive effects for biodiversity if land within 1km of the Wash is excluded. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0<br>No difference between the options is expected. Restoration options for silica sand extraction sites would not be affected by the exclusion of land within 1km of The Wash. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0<br>A small area of land within both 250 metres and 1km of The Wash is also within the Norfolk Coast AONB. However the AONB will be excluded from the areas of search. Excluding land within 1km of The Wash reduces the area of land available to be considered for an area of search. However, the area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential landscape impacts. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0<br>No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0<br>There are no groundwater source protection zones within the silica sand resource. Water quality is not expected to be affected by these options.<br>Land within 250 metres of The Wash is not graded within the Best and Most Versatile agricultural land. Some areas of land within 1km of The Wash are within grade 3 agricultural land. However, these areas are not considered to be large enough for a benefit to soil quality to occur if land within 1km of The Wash is excluded. |
| SA11: To promote sustainable use of minerals resources | 0 | -<br>Excluding land within 1km of The Wash reduces the area of land available to be considered for an area of search. This provides fewer options for future locations of silica sand extraction. |

| SA Objective | Exclude land within 250m of The Wash (the baseline option) | Exclude land within 1km of The Wash |
|---|---|---|
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | +<br>Land within both 250 metres and 1km of The Wash falls within flood zones 2 and 3. Excluding land within 1km of The Wash would exclude a larger area of land at flood risk from the areas of search for silica sand extraction. However, silica sand extraction is water compatible development. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | -/0<br>Excluding land within 1km of The Wash reduces the area of land available to be considered for an area of search. This provides fewer options for future locations of silica sand extraction. There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. |
| **Conclusion** | There are no differences between the options for the majority of the sustainability indicators. This is mainly due to the difference in land area between excluding land within 250 metres or 1km of The Wash and the location of constraints in relation to these distances from The Wash. It is considered that potential disturbance to birds from noise and light from silica sand extraction operations will be no greater at 250 metres than at 1km. Noise and light can also be controlled by planning conditions.<br>There could potentially be a positive effect from excluding land within 1km of The Wash because this would be expected to reduce the area of functional habitat that could potentially be affected. However, either option may not exclude functional habitat for The Wash as bird species may forage further inland.<br>The potential negative effect is that removing a larger area of land from consideration reduces the options available for future locations of silica sand extraction. On balance, excluding land within 1km of The Wash from an area of search is considered to be the preferred approach because it may reduce the area of functional habitat that could potentially be affected. The effects on functional habitat will also be assessed at the level of individual areas of search. | |

**Should areas of search exclude land within 250 metres of SSSIs or should a different distance be used?**

| SA Objective | Exclude land within 250m of SSSIs (the baseline option) | Exclude land within 3km of biological SSSIs (based on Natural England's Impact Risk Zones) |
|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | -<br>This option would remove such significant amounts of land that it would compromise the ability of the Plan to deliver sufficient glass sand to meet production demands. This in turn could impact on the ability of the UK glass industry to provide sufficient window glass to meet demands for more efficient glazing. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | -<br>The only parts of the resource not excluded by this option would be at the southern extent of the resource. The existing AQMAs are within King's Lynn and would not be affected.<br>If this option was brought forward; there would be significant potential increases in the transport distances between areas of search and the existing processing plant at Leziate compared only excluding land within 250 metres. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0<br>The only parts of the resource not excluded by this option would be at the southern extent of the resource. However, no difference between the options is expected. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0<br>The only parts of the resource not excluded by this option would be at the southern extent of the resource. However, no difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | -<br>The only parts of the resource not excluded by this option would be at the southern extent of the resource. The majority of the areas left are of high landscape and/or historic value. Therefore this option would be likely to disproportionately impact on these designations.<br>Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | +<br>The only parts of the resource not excluded by this option would be at the southern extent of the resource. No difference between the options is expected regarding geodiversity.<br>As this option would exclude land within 3km of biological SSSIs, this would be expected to have positive impacts on biodiversity compared to only excluding land within 250 metres of SSSIs |

| SA Objective | Exclude land within 250m of SSSIs (the baseline option) | Exclude land within 3km of biological SSSIs (based on Natural England's Impact Risk Zones) |
|---|---|---|
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | -<br>The only parts of the resource not excluded by this option would be at the southern extent of the resource. The southern extent contains the remnants of historic parkland and it is not considered that restoration in this area is likely to form any enhancement. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | -<br>The only parts of the resource not excluded by this option would be at the southern extent of the resource. The majority of the areas left are of high landscape value. Therefore this option would be likely to disproportionately impact on the quality of the landscape. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0<br>The only parts of the resource not excluded by this option would be at the southern extent of the resource. However, no difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | -<br>There are no groundwater source protection zones within the silica sand resource.<br>Water quality is not expected to be affected by these options.<br>Excluding all parts of the resource apart from the southern extent would result in less non-agricultural and low grade agricultural land being included within potential areas of search. Therefore, the potential for impacts on Best and Most Versatile land is increased. |
| SA11: To promote sustainable use of minerals resources | 0 | --<br>This option significantly reduces the area of land available to be considered for an area of search. This provides such limited options for future locations of silica sand extraction that it could mean that the forecast silica sand needs cannot be met. There would also be an increased transport distances between areas of search and the existing processing plant at Leziate. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | +<br>The land at the southern extent of the resource is mainly at low flood risk. Excluding all other land would exclude the land to the north of the resource which is at the highest risk of flooding. However, silica sand extraction is water compatible development. |
| SA13: To encourage employment opportunities and | 0 | --<br>This option would remove such significant amounts of land that it would compromise the ability of the Plan to deliver sufficient glass sand to meet |

| SA Objective | Exclude land within 250m of SSSIs (the baseline option) | Exclude land within 3km of biological SSSIs (based on Natural England's Impact Risk Zones) |
|---|---|---|
| promote economic growth | | production demands. This in turn could impact on the ability of the UK glass industry to provide sufficient window glass to meet demands. This could have downstream economic impacts in manufacturing, construction and transport jobs nationally. |
| **Conclusion** | Excluding land within 3km of SSSIs with biological features removes a significant area of the silica sand resource. The removal of this area poses major difficulties in being able to define sufficient areas of search to meet the shortfall. There are also potential negative effects on landscape, the historic environment, soil quality and transport impacts. There would be positive impacts on biodiversity by excluding land within 3km of SSSIs, however it is not considered necessary to exclude all land within 3km of SSSIs in order to avoid negative impacts on biodiversity. Due to the significant negative effects and the limited positive effects it is considered appropriate to only exclude land within 250 metres of biological SSSIs. The impacts on individual SSSIs would be better assessed at the level of individual areas of search. | |

**Should areas of search exclude land within 15 metres of ancient woodland or should a different distance from these sites be used?**

| SA Objective | Exclude land within 15m of ancient woodland (the baseline option) | Exclude land within 250m of ancient woodland |
|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0<br>No difference between the options is expected. There would not be any difference to transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0<br>No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected. There would not be any difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0<br>No difference between the options is expected. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0<br>No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0<br>Due to the small number and size of ancient woodland sites within the silica sand resource no difference between the options is expected on the historic environment. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0/+<br>No difference between the options is expected regarding geodiversity.<br>Excluding land within 250 metres of an ancient woodland site is expected to have a positive impact on biodiversity because dust emissions from mineral extraction operations can be mitigated within this distance. Excluding land within 250 metres of ancient woodland sites also increases the protection to sites from changes to groundwater from mineral extraction, although it is recognised that a greater distance may be required between ancient woodland and mineral extraction sites, depending on the details of the extraction depth, groundwater level and method of operating. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0<br>No difference between the options is expected. Restoration options for silica sand extraction sites |

| SA Objective | Exclude land within 15m of ancient woodland (the baseline option) | Exclude land within 250m of ancient woodland |
|---|---|---|
| | | would not be affected by the exclusion of land within 250 metres of ancient woodland. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0<br>Three of the ancient woodland sites are within the Norfolk Coast AONB. However the AONB will be excluded from the areas of search.<br>Excluding land within 250 metres of the remaining three ancient woodland sites slightly reduces the area of land available to be considered for an area of search. However, the area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential landscape impacts. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0<br>No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0<br>No difference between the options is expected for water quality or soil quality. |
| SA11: To promote sustainable use of minerals resources | 0 | -/0<br>Excluding land within 250 metres of ancient woodland sites reduces the area of land available to be considered for an area of search. This provides fewer options for future locations of silica sand extraction. However due to the small number and size of ancient woodland sites within the silica sand resource, this would result in only a small difference in available land area.<br>There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0<br>No difference between the options is expected. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | -<br>Excluding land within 250 metres of ancient woodland sites reduces the area of land available to be considered for an area of search. This provides fewer options for future locations of silica sand extraction. However due to the small number and size of ancient woodland sites within the silica sand resource, this would result in only a small difference in available land area. |
| **Conclusion** | There are no differences between the options for the majority of sustainability indicators. This is mainly due to the small number and size | |

| SA Objective | Exclude land within 15m of ancient woodland (the baseline option) | Exclude land within 250m of ancient woodland |
|---|---|---|
| | of ancient woodland sites within the silica sand resource. Positive impacts on biodiversity would be expected by excluding land within 250 metres of ancient woodland sites from the areas of search. Negative impacts would be expected on the use of mineral resources and economic growth because excluding land within 250 metres of ancient woodland sites from consideration as an area of search reduces the options available for future locations of silica sand extraction. However, the amount of land that would be excluded is only a very small area of the silica sand resource.<br>On balance it is considered that the positive biodiversity effects of excluding land within 250 metres of ancient woodland sites outweigh the affect this has on reducing the options available for areas of search. | |

**Should areas of search exclude land within 250 metres of designated heritage assets or should a different distance from these sites be used?**

| SA Objective | Exclude land within 250m of heritage assets (the baseline option) | Exclude land within 1km of designated heritage assets |
|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | **--**<br>This option would remove such significant amounts of land that it would compromise the ability of the Plan to deliver sufficient glass sand to meet production demands. This in turn could impact on the ability of the UK glass industry to provide sufficient window glass to meet demands for more efficient glazing. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | **--**<br>The only parts of the resource not excluded by this option would be at the northern and southern extents of the resource. The existing AQMAs are within King's Lynn and would not be affected. If this option was brought forward; there would be significant potential increases in the transport distances between areas of search and the existing processing plant at Leziate compared with the 250m buffer. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | **0**<br>The only parts of the resource not excluded by this option would be at the northern and southern extents of the resource. However, no difference between the options is expected. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | **0**<br>No difference between the options is expected because mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | -<br>The only parts of the resource not excluded by this option would be at the northern and southern extents of the resource. The majority of the areas left are of high landscape value or have the potential to contain undesignated heritage assets. Therefore this option would be likely to disproportionately impact on these. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | -<br>The only parts of the resource not excluded by this option would be at the northern and southern extents of the resource. This would remove some areas containing national and European environmental designations. However, it would concentrate the search for potential extraction sites towards an area which has the potential to contain functional habitat for birds on The Wash. |

| SA Objective | Exclude land within 250m of heritage assets (the baseline option) | Exclude land within 1km of designated heritage assets |
|---|---|---|
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | -<br>The only parts of the resource not excluded by this option would be at the northern and southern extents of the resource. The potential exists for habitat creation in the northern area similar to the existing Snettisham reserve which is in old gravel workings. The southern extent contains the remnants of historic parkland and it is not considered that restoration in this area is likely to form any enhancement. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | -<br>The northern extent of the resource forms an open landscape, and there are viewpoints from elevated positions on the boundary, extraction in this area would result in significant landscape change, although it is in a landscape which has historically been subject to a great deal of change. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | **0**<br>No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | -<br>There are no groundwater source protection zones within the silica sand resource.<br>Excluding all parts of the resource apart from the northern and southern extents would result in less non-agricultural and low grade agricultural land being included within potential areas of search. Therefore, the potential for impacts on Best and Most Versatile land is increased. |
| SA11: To promote sustainable use of minerals resources | 0 | --<br>This option significantly reduces the area of land available to be considered for an area of search. This provides only limited options for future locations of silica sand extraction and could mean that the forecast silica sand needs cannot be met.<br>There would also be an increased transport distances between areas of search and the existing processing plant at Leziate. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | -<br>The northern extent of the resource is in flood risk zones 2 and 3. Therefore if only the northern and southern extents of the resource are available, this increases the potential for mineral extraction to take place on land at higher flood risk. However, silica sand extraction is water compatible development. |
| SA13: To encourage employment opportunities and | 0 | -<br>This option would remove such significant amounts of land that it would compromise the ability of the |

| SA Objective | Exclude land within 250m of heritage assets (the baseline option) | Exclude land within 1km of designated heritage assets |
|---|---|---|
| promote economic growth | | Plan to deliver sufficient glass sand to meet production demands. This in turn could impact on the ability of the UK glass industry to provide sufficient window glass to meet demands. This could have downstream economic impacts in manufacturing, construction and transport jobs nationally. |
| **Conclusion** | There are a large number of potential negative effects from the exclusion of land within 1km of designated heritage assets. This option would exclude such a large area of land from consideration for silica sand extraction that there could be negative impacts on minerals, the economy and transport. The few areas that would not be excluded are at higher flood risk, higher agricultural land quality, near to The Wash, of high landscape quality and potentially containing undesignated heritage assets. Therefore there would also be negative impacts on all of these sustainability objectives. The setting of a heritage asset is likely to be different for each heritage asset. Therefore, excluding land within 1km of every designated heritage asset is not an appropriate way to ensure no adverse impacts on heritage assets. Therefore, due to the significant number of negative impacts expected from excluding land within 1km of designated heritage assets it is considered to be appropriate to only exclude land within 250 metres of designated heritage assets. A full assessment of potential impacts on designated heritage assets would be more appropriately carried out at the level of individual areas of search. | |

**Should areas of search exclude land within 5km of the Norfolk Coast Area of Outstanding Natural Beauty or only exclude land within the AONB?**

| SA Objective | Exclude land within the Norfolk Coast AONB (the baseline option) | Exclude land within 5km of the Norfolk Coast AONB |
|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | -<br>Excluding land within 5km of the Norfolk Coast AONB would lead to increased transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | -<br>The existing AQMAs are within King's Lynn and would not be affected. However, excluding land within 5km of the Norfolk Coast AONB would lead to increased transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0/+<br>No difference between the options is expected with regards to noise and vibration. Excluding land within 5km of the AONB is expected to have a positive effect on visual intrusion within the 5km area. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0<br>No difference between the options is expected because mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0<br>There are heritage assets located within 5km of the AONB. Therefore, there could be a positive effect on heritage assets within this area if this land is excluded from an area of search. However, there are also heritage assets within the area of search outside 5km from the AONB which would potentially be subject to increased pressure for development because some choices will be removed.<br>Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0<br>There are biodiversity and geodiversity features within 5km of the AONB including European designated sites. Therefore, there could be a positive effect on biodiversity and geodiversity within this area if this land is excluded from an area of search. However, there are also biodiversity and geodiversity features within the area of search outside 5km from the AONB which would potentially be subject to increased pressure for |

| SA Objective | Exclude land within the Norfolk Coast AONB (the baseline option) | Exclude land within 5km of the Norfolk Coast AONB |
|---|---|---|
| | | development because some choices will be removed. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0<br>No difference is expected between the options. Restoration options for silica sand extraction sites would not be affected by the exclusion of land within 5km of the AONB. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0<br>Excluding land within 5km of the AONB is likely to be largely neutral. An AONB has no defined setting. While it is possible that excluding land within 5km of the AONB may prevent degradation of views from within the AONB it is equally likely that for a particular development in a particular location a greater or lesser distance would be required depending on local topography. The type of mitigation measures proposed are also likely to influence the acceptable distance of a mineral extraction site from the AONB. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0<br>No difference between the options is expected |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0/-<br>There are no groundwater source protection zones within the silica sand resource. No differences are expected in water quality.<br>There is a large area of grade 3 agricultural land within 5km of the AONB. However, there is also large area of low grade agricultural land and non – agricultural land within 5km of the AONB. The resource area remaining contains a larger proportion of grade 3 land. Therefore there would be a negative impact on soil quality if this land is excluded from the areas of search. |
| SA11: To promote sustainable use of minerals resources | 0 | -<br>Excluding land within 5km of the AONB reduces the area of land available to be considered for an area of search. This provides fewer options for future locations of silica sand extraction. Land within 5km of the AONB has previously been used for silica sand extraction and therefore it is expected that silica sand of a suitable quality could be found within this 5km area.<br>There would also be an increased transport distances between areas of search and the existing processing plant at Leziate. |
| SA12: To reduce the risk of current and future flooding at new | 0 | +<br>There is land in flood zones 2 and 3 within 5km of the Norfolk Coast AONB which would be excluded |

| SA Objective | Exclude land within the Norfolk Coast AONB (the baseline option) | Exclude land within 5km of the Norfolk Coast AONB |
|---|---|---|
| and existing development | | from the areas of search if land within 5km of the AONB is excluded. However, silica sand extraction is water compatible development. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | -<br>Excluding land within 5km of the Norfolk Coast AONB reduces the area of land available to be considered for an area of search. This provides fewer options for future locations of silica sand extraction. Land within 5km of the AONB has previously been used for silica sand extraction and therefore it is expected that silica sand of a suitable quality could be found within this 5km area. |
| **Conclusion** | Excluding land within 5km of the AONB is expected to have negative effects on economic growth, mineral resources and transport impacts because there would be fewer options for locations for silica sand extraction and increased transport distances to the processing plant. Also a negative effect on agricultural land, due to the distribution of agricultural land grades.<br>Excluding land within 5km of the AONB is expected to have positive effects on flood risk due to the large areas of land in flood zones 2 and 3 in this location.<br>There are no differences between the options for the majority of sustainability indicators because whilst there may be positive effects within the 5km area, there could be negative effects outside it due to fewer options for locations of silica sand extraction and therefore increased pressure for development outside the 5km area.<br>It is therefore considered appropriate to only exclude the Norfolk Coast AONB itself from the areas of search and include land within 5km of the AONB. | |

**Should areas of search exclude land within 125 metres of sensitive receptors for amenity impacts, or should a different distance be used?**

| SA Objective | Exclude land within 125m of sensitive receptors (the baseline option) | Exclude land within 250 metres of sensitive receptors |
|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0<br>No difference between the options is expected. There would not be a significant difference to transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0<br>No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected. There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | +<br>Whilst it is considered that a distance of 125 metres from sensitive receptors for amenity impacts is sufficient, with mitigation measures, increasing that distance to 250 metres will further minimise amenity impacts.<br>It is considered that a distance of 125 metres from sensitive receptors for amenity impacts is sufficient, with mitigation measures. However, increasing that distance to 250 metres will further minimise amenity impacts, with lower levels of mitigation necessary. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0<br>No difference between the options is expected because mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0<br>There are likely to be heritage assets located both within 125 metres and 250 metres of sensitive receptors. Therefore no difference between the options is expected. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0<br>No difference between the options is expected. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0<br>No difference between the options is expected. Restoration options for silica sand extraction sites would not be affected by the exclusion of land within 250 metres of sensitive receptors. |

| SA Objective | Exclude land within 125m of sensitive receptors (the baseline option) | Exclude land within 250 metres of sensitive receptors |
|---|---|---|
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0<br>No difference between the options is expected. Some land within both 125 metres and 250 metres of sensitive receptors for amenity impacts is within the AONB. However, land within the AONB will be excluded from the areas of search. Excluding land within 250 metres of sensitive receptors for amenity impacts reduces the area of land available to be considered for an area of search. However, the area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential landscape impacts. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | +<br>It is considered that a distance of 125 metres from sensitive receptors for amenity impacts is sufficient, with mitigation measures. However, increasing that distance to 250 metres will further minimise impacts with lower levels of mitigation necessary. No difference between the options is expected regarding the potential for amenity gains (such as footpaths or public open space) on restoration. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0<br>No difference between the options is expected. |
| SA11: To promote sustainable use of minerals resources | 0 | -/0<br>Excluding land within 250 metres of sensitive receptors for amenity impacts reduces the area of land available to be considered for an area of search. This provides fewer options for future locations of silica sand extraction.<br>There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0<br>No difference between the options is expected. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | -<br>Excluding land within 250 metres of sensitive receptors for amenity impacts reduces the area of land available to be considered for an area of search. This provides fewer options for future locations of silica sand extraction. |
| **Conclusion** | There are no differences between the options for the majority of the sustainability indicators. This is mainly due to the location of constraints in relation to sensitive receptors for amenity impacts. Excluding land | |

| SA Objective | Exclude land within 125m of sensitive receptors (the baseline option) | Exclude land within 250 metres of sensitive receptors |
|---|---|---|
| | within 250 metres of sensitive receptors is likely to have positive effects on amenity. However, there are potential negative effects on the use of mineral resources and economic growth because removing a larger area of land from consideration reduces the options available for future locations of silica sand extraction. On balance it is considered that the positive amenity effects of excluding land within 250 metres of sensitive receptors outweigh the affect this has on reducing the options available for areas of search, as specific mitigation methods for amenity impacts on silica sand development within the areas of search are not yet known. | |

**Should areas of search exclude allocated sites and sites with planning permission for non-mineral uses that are located in or adjacent to the silica sand resource, or include this land?**

| SA Objective | Exclude land with planning permission or allocated for non-mineral uses (the baseline option) | Include land with planning permission or allocated for non-mineral uses |
|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0<br>No difference between the options is expected. There would not be a significant difference to transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0<br>No difference between the options is expected. There is not an existing AQMA within the area underlain by the silica sand resource. There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0<br>No difference between the options is expected. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0<br>No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0<br>No difference between the options is expected. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0<br>No difference between the options is expected. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0<br>No difference between the options is expected. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0<br>No difference between the options is expected. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0<br>No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0<br>No difference between the options is expected. |

| SA Objective | Exclude land with planning permission or allocated for non-mineral uses (the baseline option) | Include land with planning permission or allocated for non-mineral uses |
|---|---|---|
| SA11: To promote sustainable use of minerals resources | 0 | 0<br>No difference between the options is expected. There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. Prior extraction of silica sand could occur through implementation of mineral safeguarding policy CS16 even if the land is not included within an area of search for silica sand extraction. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0<br>No difference between the options is expected. Flood risk assessment would be required as part of the local plan and planning application process for both mineral and non-mineral development. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | 0<br>No difference between the options is expected. Prior extraction of silica sand could occur through implementation of mineral safeguarding policy CS16 even if the land is not included within an area of search for silica sand extraction. |
| **Conclusion** | No difference between the two options is expected because land with planning permission or allocated for non-mineral uses would be expected to be developed for these uses whether or not prior extraction of silica sand takes place. This means that the land would be developed regardless of whether it is within an area of search for silica sand extraction.<br><br>Excluding land with planning permission, or allocated for non-mineral uses from the areas of search for silica sand extraction is considered to be the correct approach to take because the implementation of Core Strategy Policy CS16 on mineral safeguarding is the provides a more appropriate method to assess whether prior extraction of silica sand should occur in these locations. | |

**Should areas of search only include the silica sand resource within the Leziate Beds or should the whole silica sand resource, as mapped by the BGS, be included?**

| SA Objective | Include the Leziate Beds only (the baseline option) | Include the whole silica sand resource as mapped by the BGS |
|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0<br>No difference between the options is expected. There would not be a significant difference to transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0<br>No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected. There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0<br>No difference between the options is expected. The Leziate Beds cover a smaller land area than the whole silica sand resource. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential amenity impacts. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0<br>No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0<br>No difference between the options is expected. The Leziate Beds cover a smaller land area than the whole silica sand resource. There are heritage assets within both the Leziate Beds and the wider silica sand resource. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0<br>No difference between the options is expected regarding geodiversity.<br>No difference between the options is expected regarding biodiversity. The majority of designated sites for ecology at both the local and national level are located within the Leziate Beds. Restoration options for silica sand extraction, for example to deliver ecological benefits, would not be affected by the size of the resource included in the area of search. |
| SA7: To promote innovative solutions for | 0 | 0<br>No difference between the options is expected. Restoration options for silica sand extraction sites |

| SA Objective | Include the Leziate Beds only (the baseline option) | Include the whole silica sand resource as mapped by the BGS |
|---|---|---|
| the restoration and after use of minerals sites | | would not be affected by the size of the resource included in the area of search. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0<br>No difference between the options is expected. Part of the Leziate Beds and the wider silica sand resource is within the AONB, however land within the AONB will be excluded from areas of search. The Leziate Beds cover a smaller land area than the whole silica sand resource. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential landscape impacts. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0<br>No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0<br>No difference between the options is expected. There are no groundwater source protection zones within the silica sand resource. Water quality is not expected to be affected by these options.<br>Grade 1 and 2 agricultural land will be excluded from the areas of search anyway. There is some grade 3 agricultural land underlain by both the Leziate Beds and the wider silica sand resource. |
| SA11: To promote sustainable use of minerals resources | 0 | 0<br>Including the whole silica sand resource in the areas of search provides more options for future locations of silica sand extraction. However, it is most likely that suitable locations for the extraction of silica sand, suitable for glass manufacture, will be from within the Leziate Beds. Therefore including the Leziate Beds only provides more certainty as to where future extraction is likely to take place.<br>There would not be a significant difference to transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0<br>No difference between the options is expected. Including the Leziate Beds only does not remove any significant areas of land at flood risk from the area of search. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | 0<br>Including the whole silica sand resource in the areas of search provides more options for future locations of silica sand extraction. However, it is most likely that suitable locations for the extraction of silica sand, suitable for glass manufacture, will be from |

| SA Objective | Include the Leziate Beds only (the baseline option) | Include the whole silica sand resource as mapped by the BGS |
|---|---|---|
| | | within the Leziate Beds. Therefore including the Leziate Beds only provides more certainty as to where future extraction is likely to take place. |
| **Conclusion** | There are no differences between the options for the sustainability indicators. This is because generally, constraints (such as amenity, ecology, landscape and heritage assets) either occur in both the Leziate Beds and the wider silica sand resource, or neither of them (such as groundwater source protection zones).<br>The Leziate Beds cover a smaller land area than the whole silica sand resource. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect the majority of potential impacts.<br>It is also more likely that suitable locations for the extraction of silica sand, suitable for glass manufacture, will be from within the Leziate Beds. Therefore, including the Leziate Beds only provides more certainty as to where future extraction is likely to take place. | |

**Should areas of search exclude agricultural land grade 3 (good to moderate), or include this land?**

| SA Objective | Exclude grade 3 agricultural land (the baseline option) | Include grade 3 agricultural land |
|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | +<br>Including grade 3 agricultural land increases the area of land suitable to be considered for an area of search. There is some grade 3 agricultural land to the south of the existing processing plant. Therefore including grade 3 agricultural land potentially reduces the distance that sand would need to be transported for processing. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0<br>No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0<br>No difference between the options is expected. Including grade 3 agricultural land increases the area of land suitable to be considered for an area of search. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential amenity impacts. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0<br>No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0<br>No difference between the options is expected. There are heritage assets within all grades of agricultural land. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0<br>No difference between the options is expected regarding geodiversity.<br>No difference between the options is expected regarding biodiversity. There are designated sites for ecology within grade 3 land, but also on lower grade and non-agricultural land. Restoration options for silica sand extraction, for example to deliver ecological benefits, would not be affected by whether or not grade 3 land is included within an area of search. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0<br>No difference between the options is expected. |

| SA Objective | Exclude grade 3 agricultural land (the baseline option) | Include grade 3 agricultural land |
|---|---|---|
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0<br>No difference between the options is expected. Some grade 3 agricultural land is within the AONB, however land within the AONB will be excluded from areas of search. Including grade 3 agricultural land in areas of search would cover a larger land area than excluding grade 3 land. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential landscape impacts. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0<br>No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0/-<br>There are no groundwater source protection zones within the silica sand resource. Therefore they will not be affected by which grades of agricultural land are included. Water quality is not expected to be affected by the agricultural land grades included in the areas of search.<br>Including grade 3 agricultural land within the areas of search could lead to the loss of grade 3a agricultural land. This loss could be temporary or permanent, depending on the timescale for silica sand extraction and whether the site is subsequently restored back to agricultural use. |
| SA11: To promote sustainable use of minerals resources | 0 | +<br>Including grade 3 agricultural land in the areas of search provides more options for future locations of silica sand extraction.<br>There is some grade 3 agricultural land to the south of the existing processing plant. Therefore including grade 3 agricultural land potentially reduces the distance that sand would need to be transported for processing. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0<br>A large area in the north of the silica sand resource is both grade 3 land and at risk of flooding. However there is not this correlation between all grade 3 land and flood risk zones. Silica sand extraction is water compatible development therefore no difference between the options is expected. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | +/-<br>Including grade 3 land increases the area of land suitable to be considered for an area of search. This provides more options for future locations of silica sand extraction. The timescale of the silica |

| SA Objective | Exclude grade 3 agricultural land (the baseline option) | Include grade 3 agricultural land |
|---|---|---|
| | | sand operations and the type of restoration would affect how long the land would not be in productive agricultural use. |
| **Conclusion** | There are no differences between the options for the majority of the sustainability indicators. This is because generally constraints (such as amenity, ecology, landscape and heritage assets) either occur in both grade 3 and other grades of agricultural and non-agricultural land, or none of them (such as groundwater source protection zones).<br>The main benefits of including grade 3 agricultural land are that this provides more options for future locations of silica sand extraction. The only potential negative effects are the temporary or permanent loss of grade 3 agricultural land to silica sand extraction, depending on the final restoration of the site. Due to the national importance of silica sand this is considered to be an acceptable trade off. | |

**Should areas of search exclude land in flood zones 2 and 3, or include this land?**

| SA Objective | Exclude land in flood zones 2 & 3 (the baseline option) | Include land in flood zones 2 and 3 |
|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0<br>No difference between the options is expected. Silica sand extraction is water compatible development. Including land in flood zones 2 and 3 would not affect the distance that sand would need to be transported for processing. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0<br>No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0<br>No difference between the options is expected. Including land in flood zones 2 and 3 increases the area of land suitable to be considered for an area of search. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential amenity impacts. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0<br>No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0<br>No difference between the options is expected. There are likely to be heritage assets located in all flood zones. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0<br>No difference between the options is expected regarding geodiversity.<br>No difference between the options is expected regarding biodiversity. There are designated sites for ecology within land in flood zones 2 and 3, but also on land in flood zone 1. Restoration options for silica sand extraction, for example to deliver ecological benefits, are unlikely to be affected by whether or not land in flood zones 2 and 3 are included within an area of search. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | +<br>There is the potential for additional flood storage capacity to be provided on restoration of a silica sand extraction site in flood zones 2 or 3. |
| SA8: To protect and enhance the quality and distinctiveness of the | 0 | 0<br>No difference between the options is expected. Some land in flood zones 2 and 3 is within the |

| SA Objective | Exclude land in flood zones 2 & 3 (the baseline option) | Include land in flood zones 2 and 3 |
|---|---|---|
| countryside and landscape | | AONB, however land within the AONB will be excluded from areas of search. Including land in flood zones 2 and 3 within areas of search would cover a larger land area than excluding them. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential landscape impacts. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0<br>No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0<br>No difference between the options is expected. There are no groundwater source protection zones within the silica sand resource. Water quality is not expected to be affected by the inclusion of grade 2 and 3 flood risk zones.<br>All grades of agricultural land and non-agricultural land fall within flood zones 2 and 3. Therefore there is no direct impact on soil quality from including land in flood zones 2 and 3 within the areas of search. |
| SA11: To promote sustainable use of minerals resources | 0 | **+**<br>Including land in flood zones 2 and 3 in the areas of search provides more options for future locations of silica sand extraction. Including land in flood zones 2 and 3 would not affect the distance that sand would need to be transported for processing. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | **0**<br>Silica sand extraction is water compatible development. However, land in flood zone 1 is preferable for development and the sequential test should be used in the selection of areas for silica sand extraction.<br>There is the potential for additional flood storage capacity to be provided on restoration of a silica sand extraction site in flood zones 2 or 3. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | 0<br>Including land in flood zones 2 and 3 increases the area of land suitable to be considered for an area of search. This provides more options for future locations of silica sand extraction. Silica sand extraction is 'water compatible' development. Therefore it is not considered that this will affect employment and economic growth. |
| **Conclusion** | There are no differences between the options for the majority of the sustainability indicators. This is because generally constraints (such as amenity, ecology, landscape and heritage assets) either occur in all flood zones, or none of them (such as groundwater source protection zones). | |

| SA Objective | Exclude land in flood zones 2 & 3 (the baseline option) | Include land in flood zones 2 and 3 |
|---|---|---|
| | The main benefits of including flood zones 2 and 3 are that this provides more options for future locations of silica sand extraction because silica sand is water compatible development. There is also the potential for additional flood storage capacity to be provided on restoration of a silica sand extraction site. | |

**Should an area of search be at least 20 hectares in area or should all areas of search be considered?**

| SA Objective | Areas of search to be at least 20 hectares in area (the baseline option) | All areas of search to be considered regardless of size |
|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | +<br>Some of the potential areas of search which are less than 20 hectares in size are located near to the processing plant at Leziate. Therefore excluding these areas of search potentially increases the distance that silica sand would need to be transported for processing. However, it is considered unlikely that sites of less than 20 hectares in size would be developed. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0/+<br>The existing AQMAs are within King's Lynn and would not be affected. However, some of the potential areas of search which are less than 20 hectares in size are located near to the processing plant at Leziate. Therefore excluding these areas of search potentially increases the distances that silica sand would need to be transported for processing. However, it is considered unlikely that sites of less than 20 hectares in size would be developed. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0<br>No difference between the options is expected because the areas of search are all at least 250 metres from sensitive receptors for amenity impacts. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0<br>No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0/+<br>Effects are not expected on the townscape because extraction will not take place in urban areas. The sieve mapping process means that all potential areas of search are at least 250metres from heritage assets. While the setting of an asset may extend further than 250m this is no more likely for areas under 20 hectares than over. Including areas of search under 20 hectares would mean that the choice of potential locations for extraction was greater. Therefore, more opportunities would be available outside the setting of a heritage asset. However, it is considered unlikely that sites of less than 20 hectares in size would be developed. |
| SA6: To protect and enhance Norfolk's | 0 | 0 |

| SA Objective | Areas of search to be at least 20 hectares in area (the baseline option) | All areas of search to be considered regardless of size |
|---|---|---|
| biodiversity and geodiversity | | No difference between the options is expected on geodiversity or biodiversity. The smaller sites exhibit the same general relationship with biodiversity and geodiversity sites as the larger sites over 20 hectares. However, it is considered unlikely that sites of less than 20 hectares in size would be developed. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0<br>No difference between the options is expected. Restoration options for silica sand extraction sites would not be affected by the minimum size of areas of search. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0<br>No difference between the options is expected. The areas of search exclude land within the AONB. Including all areas of search regardless of size means that there would be more areas of search covering a greater total land area. The areas of search are areas within which planning permission may be granted for a more specific parcel of land and therefore the aggregated size of the areas of search does not affect potential landscape impacts. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0<br>No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0<br>There are no groundwater source protection zones within the silica sand resource. Surface water quality will not be affected by the options.<br>In terms of soil quality, the areas of search exclude grade 1 and 2 agricultural land. A few of the areas of search of less than 20 hectares are on grade 3 agricultural land. However, it is considered unlikely that sites of less than 20 hectares in size would be developed. |
| SA11: To promote sustainable use of minerals resources | 0 | 0<br>Including all potential areas of search regardless of size will theoretically provide more options for future locations of silica sand extraction. However, it is unlikely that extraction sites will come forward for less than 20 hectares of land and therefore smaller areas of search are unlikely to be developed. Therefore it is not considered that this option will affect the supply of silica sand. |
| SA12: To reduce the risk of current and future flooding at new | 0 | 0<br>No difference between the options is expected. Only one of the potential areas of search that are less than 20 hectares in size has any land within |

| SA Objective | Areas of search to be at least 20 hectares in area (the baseline option) | All areas of search to be considered regardless of size |
|---|---|---|
| and existing development | | flood zone 2 or 3. Silica sand extraction is water compatible development. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | 0<br>Including all potential areas of search regardless of size will theoretically provide more options for future locations of silica sand extraction. However, it is unlikely that extraction sites will come forward for less than 20 hectares of land and therefore smaller areas of search are unlikely to be developed. Therefore it is not considered that this option will affect employment and economic growth. |
| **Conclusion** | There are no differences between the options for the majority of sustainability indicators. This is because all areas of search have been defined using the same methodology and therefore areas of search above and below 20 hectares in size will be located at the same minimum distances from a range of planning constraints.<br>There are potential positive effects if all areas of search are included regardless of size because some of the areas of search of less than 20 hectares are close to the existing processing plant at Leziate.<br>Including all areas of search regardless of size will theoretically provide more options for future locations of silica sand extraction. However, it is unlikely that extraction sites will come forward for less than 20 hectares of land and therefore smaller areas of search are unlikely to be developed. | |

### 4.6 Conclusions of the Sustainability Appraisal on the strategic options for defining areas of search

A summary of the conclusions of the Sustainability Appraisal of the strategic options for defining areas of search for silica sand extraction are as follows and the areas of search have been defined using the following criteria:

**Exclude land within the hydrological catchments of Roydon Common and Dersingham Bog SAC from the areas of search**
There are no differences between the options for the majority of the sustainability indicators. There would be a positive effect on biodiversity by excluding land based on hydrological catchments because it would remove land where the potential to impact on water dependent features is higher. The potential negative effects are that removing a larger area of land from consideration reduces the options available for future locations of silica sand extraction closest to the Leziate. Overall it is considered that excluding land based on hydrological catchments from an area of search is considered to be an acceptable approach due to the international importance of Roydon Common and Dersingham Bog.

**Exclude land within 1km of The Wash from the areas of search**
There are no differences between the options for the majority of the sustainability indicators. There could be a positive effect on biodiversity from excluding land within 1km of The Wash. However, either option may not exclude functional habitat for The Wash as bird species may forage further inland. It is considered that potential disturbance to birds from noise and light from silica sand extraction operations will be no greater at 250 metres than at 1km. Noise and light can also be controlled by planning conditions. The potential negative effect is that removing a larger area of land from consideration reduces the options available for future locations of silica sand extraction. On balance land within 1km of The Wash will be excluded from the areas of search because this would be expected to reduce the area of functional habitat that could potentially be affected. It is also considered that by excluding land within 1km of The Wash, mineral extraction would be unlikely to have an adverse effect on the integrity of The Wash SSSI, SAC, SPA or Ramsar site.

**Exclude land within 250 metres of SSSIs from the areas of search**
Excluding land within 3km of SSSIs with biological features removes a significant area of the silica sand resource which would pose major difficulties in being able to define sufficient areas of search to meet the shortfall. There would be significant negative effects on a number of sustainability objectives and limited positive effects. It is not considered necessary to exclude 3km around all SSSIs to avoid negative effects on biodiversity. Therefore, it is considered appropriate to only exclude land within 250 metres of biological SSSIs; the impacts on individual SSSIs would be better assessed at the level of individual areas of search.

**Exclude land within 250 metres of ancient woodland from the areas of search**
There are no differences between the options for the majority of sustainability indicators. On balance it is considered that the positive biodiversity effects of excluding land within 250 metres of ancient woodland sites outweigh the affect this has on reducing the options available for areas of search because the area of land excluded is a very small area of the silica sand resource.

**Exclude land within 250 metres of designated heritage assets from the areas of search**
Due to the significant number of negative impacts expected from excluding land within 1km of designated heritage assets it is considered to be appropriate to only exclude land within 250 metres of designated heritage assets. The setting of a heritage asset is likely to be different for each heritage asset and therefore excluding land within 1km of every designated heritage assets is not an appropriate way to ensure no adverse impacts on heritage assets. A full assessment of potential impacts on designated heritage assets would be more appropriately carried out at the level of individual areas of search.

**Exclude land within the Norfolk Coast AONB from the areas of search**
Excluding land within 5km of the AONB is expected to have negative effects on economic growth, mineral resources, transport impacts and agricultural land and positive effects on flood risk. There

are no differences between the options for the majority of sustainability indicators because whilst there may be positive effects within the 5km area, there could be negative effects outside it due to increased development pressure. It is therefore considered appropriate to only exclude the Norfolk Coast AONB itself from the areas of search and include land within 5km of the AONB.

**Exclude land within 250 metres of sensitive receptors for amenity impacts from the areas of search**

There are no differences between the options for the majority of the sustainability indicators. Excluding land within 250 metres of sensitive receptors is likely to have positive effects on amenity. On balance it is considered that the positive amenity effects of excluding land within 250 metres of sensitive receptors outweigh the affect this has on reducing the options available for areas of search, as specific mitigation methods for amenity impacts on silica sand development within the areas of search are not yet known.

**Exclude land with planning permission or allocated for non-mineral uses from the areas of search**

No difference between the two options is expected. Excluding land with planning permission, or allocated for non-mineral uses from the areas of search for silica sand extraction is considered to be the correct approach to take because the implementation of Core Strategy Policy CS16 on mineral safeguarding is the provides a more appropriate method to assess whether prior extraction of silica sand should occur in these locations.

**Only include the Leziate Beds mineral deposit within the areas of search**

There are no differences between the options for the sustainability indicators. It is more likely that suitable locations for the extraction of silica sand, suitable for glass manufacture, will be from within the Leziate Beds. Therefore, including the Leziate Beds only provides more certainty as to where future extraction is likely to take place.

**Include grade 3 agricultural land within the areas of search**

There are no differences between the options for the majority of the sustainability indicators. The main benefits of including grade 3 agricultural land are that this provides more options for future locations of silica sand extraction. The only potential negative effects are the temporary or permanent loss of grade 3 agricultural land to silica sand extraction, depending on the final restoration of the site. Due to the national importance of silica sand this is considered to be an acceptable trade off.

**Include land within Flood Zones 2 and 3 within the areas of search**

There are no differences between the options for the majority of the sustainability indicators. The main benefits of including flood zones 2 and 3 are that this provides more options for future locations of silica sand extraction because silica sand is water compatible development. There is also the potential for additional flood storage capacity to be provided on restoration of a silica sand extraction site.

**Areas of search to be at least 20 hectares in size**

There are no differences between the options for the majority of sustainability indicators. Including all areas of search regardless of size will theoretically provide more options for future locations of silica sand extraction. However, it is unlikely that extraction sites will come forward for less than 20 hectares of land and therefore smaller areas of search are unlikely to be developed.

The assessment table for the full Policy MP2 is contained in Appendix A to this Sustainability Appraisal Report.

## 5. Predicting the Effects of the Minerals and Waste Local Plan Review, including alternatives (Task B3)

A sustainability appraisal has also been carried out on all of the proposed policies for minerals and waste management development and alternatives. The appraisal tables for each policy are contained in Appendix A to this report. Appraisal tables for the assessment of alternatives to policies WP1, WP2, MP1 and MP2 are contained in section 4 of this report.

A sustainability appraisal has been carried out on all of the proposed specific sites for mineral extraction and the areas of search for future silica sand extraction. The specific sites are all considered as alternatives within the Initial Consultation and the Sustainability Appraisal. The appraisal tables for each proposed site and area are contained in Appendix B to this report.

## 6. Task B4: Evaluating the Effects of the Minerals and Waste Local Plan Review

### Overall Effects of the Minerals and Waste Local Plan Review

The effects of each of the proposed specific sites and areas of search on the SA/SEA objectives are summarised in Table 6.1 overleaf. Details of specific effects from the proposed specific sites and areas of search are provided in the individual site assessment tables in Appendix B.

The overall effects of the M&WLPR planning policies on the SA/SEA objectives are summarised in Table 6.2 overleaf. Details of specific policy effects are provided in the individual policy assessment tables in Appendix A. Overall, the proposed policies will have mainly positive or neutral effects. This is largely due to the nature of the policies which aim to protect the amenity of local communities, the natural, built and historic environment, the landscape and townscape of Norfolk.

### Short, medium and long term effects of the Minerals and Waste Local Plan Review

The short, medium and long term effects of the proposed planning policies (general policies, waste management specific policies, and minerals specific policies) have been assessed and the assessment tables for all of the policies are contained in Appendix A.

The short and medium term effects of mineral extraction at the proposed specific sites and within the areas of search are assessed under the 'operational' stage (the first SA score). Long term effects – restoration and post-restoration stages – are assessed by the second SA score. The assessment tables for the proposed specific sites and areas of search are contained in Appendix B.

### Cumulative and synergistic effects of the M&WLPR and consideration of alternatives

The specific sites proposed for mineral extraction are all considered as alternatives within the Initial Consultation document and the Sustainability Appraisal. The strategic alternatives for policies WP1, WP2, MP1 and MP2 are assessed in section 4 of this report.

The Minerals and Waste Local Plan Review contain proposed policies MP6 and MW2 which specifically refer to the assessment of cumulative impacts, as follows:

Policy MP6 'Cumulative impacts and phasing of workings' provides details that a proposed mineral extraction site must comply with to ensure that cumulative impacts can be adequately mitigated to enable a proposal to be acceptable.

Policy MW2 'Development Management Criteria' includes a requirement that it must be demonstrated that minerals and/or waste development would not have an unacceptable impact (including cumulative impact in combination with other existing or permitted development) on a list of development management criteria. The supporting text to the policy provides further details on how cumulative impacts will be assessed at the planning application stage.

As this is the Initial Consultation stage on the M&WLPR, details of potential cumulative and synergistic effects of the specific sites and areas for mineral extraction cannot be assessed yet because it is not known which of the proposed sites for mineral extraction will be allocated in the M&WLPR. Therefore the cumulative and synergistic effects of the M&WLPR will be assessed at the next stage of the process.

**Table 6.1. Summary of Sustainability Effects of the proposed mineral extraction sites and areas of search**

| Site | SA1 | SA2 | SA3 | SA4 | SA5 | SA6 | SA7 | SA8 | SA9 | SA10 | SA11 | SA12 | SA13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MIN 12** | ++ / 0 | 0 / 0 | -- / 0 | 0 / 0 | - / 0 | 0 / 0 | 0 / + | - / 0 | - / 0 | 0/- / 0 | ++ / 0 | ++ / 0 | + / 0 |
| **MIN 51 & 13** | ++ / 0 | - / 0 | - / 0 | 0 / 0 | 0 / 0 | 0 / 0 | 0 / + | - / 0 | - / 0 | 0/- / 0 | ++ / 0 | 0 / 0 | + / 0 |
| **MIN 08** | + / 0 | - / 0 | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0 | 0 / + | - / 0 | 0 / 0 | 0/- / 0 | ++ / 0 | 0 / 0 | + / 0 |
| **MIN 23** | + / 0 | - / 0 | - / 0 | 0 / 0 | -- / -- | 0 / 0 | 0 / ? | -- / - | - / 0 | 0/- / 0 | + / 0 | ++ / 0 | + / 0 |
| **MIN 200** | ++ / 0 | 0 / 0 | - / 0 | 0 / 0 | -- / - | 0 / 0 | 0 / + | - / 0 | - / 0 | 0/- / - | ++ / 0 | ++ / 0 | + / 0 |
| **MIN 116** | + / 0 | - / 0 | -- / 0 | 0 / 0 | -- / - | 0 / 0 | 0 / + | - / - | - / 0 | 0/- / 0 | + / 0 | ++ / 0 | + / 0 |
| **MIN 35** | ++ / 0 | - / 0 | -- / 0 | 0 / 0 | -- / - | - / 0 | 0 / + | - / 0 | - / 0 | 0 / 0 | ++ / 0 | ++ / 0 | + / 0 |
| **MIN 102** | ++ / 0 | - / 0 | 0 / 0 | 0 / 0 | 0 / 0 | -- / ? | 0 / ? | -- / - | 0 / 0 | -/0 / 0 | ++ / 0 | 0 / 0 | + / 0 |
| **MIN 201** | ++ / 0 | - / 0 | - / 0 | 0 / 0 | -- / - | -- / ? | 0 / + | - / - | - / 0 | -/- / 0 | ++ / 0 | ++ / 0 | + / 0 |
| **MIN 55** | ++ / 0 | - / 0 | 0 / 0 | 0 / 0 | 0 / 0 | - / 0 | 0 / ? | 0 / 0 | - / 0 | 0/- / 0/- | ++ / 0 | 0 / 0 | + / 0 |
| **MIN 202** | ++ / 0 | - / 0 | - / 0 | 0 / 0 | 0 / 0 | - / - | 0 / + | - / 0 | - / 0 | 0 / 0 | ++ / 0 | ++ / 0 | + / 0 |
| **MIN 48** | ++ / 0 | - / 0 | - / 0 | 0 / 0 | -- / - | - / 0 | 0 / + | - / 0 | - / 0 | 0 / 0 | ++ / 0 | ++ / 0 | + / 0 |
| **MIN 37** | + / 0 | 0 / 0 | -- / 0 | 0 / 0 | 0 / 0 | - / 0 | 0 / + | - / 0 | - / 0 | 0/- / 0 | + / 0 | ++ / 0 | + / 0 |
| **MIN 64** | + / 0 | 0 / 0 | -- / 0 | 0 / 0 | - / 0 | 0 / 0 | 0 / + | - / 0 | - / 0 | 0/- / 0 | + / 0 | ++ / 0 | + / 0 |
| **MIN 65** | + / 0 | 0 / 0 | -- / 0 | 0 / 0 | -- / - | - / 0 | 0 / + | - / 0 | - / 0 | 0/- / 0 | + / 0 | ++ / 0 | + / 0 |
| **MIN 96** | ++ / 0 | 0 / 0 | -- / 0 | 0 / 0 | -- / - | - / 0 | 0 / ? | - / 0 | - / 0 | 0/- / 0/- | ++ / 0 | ++ / 0 | + / 0 |
| **MIN 203** | ++ / 0 | 0 / 0 | - / 0 | 0 / 0 | 0 / 0 | - / 0 | 0 / + | 0 / 0 | - / 0 | -/- / 0/- | ++ / 0 | ++ / + | + / 0 |
| **MIN 38** | + / 0 | - / 0 | - / 0 | 0 / 0 | -- / -- | - / 0 | 0 / + | - / 0 | - / 0 | -/- / 0/- | + / 0 | ++ / 0 | + / 0 |
| **MIN 6** | ++ / 0 | 0 / 0 | - / 0 | 0 / 0 | 0 / 0 | 0 / 0 | 0 / + | 0 / 0 | - / 0 | -/0 / 0 | ++ / 0 | ++ / 0 | + / 0 |
| **MIN 45** | + / + | 0 / 0 | 0 / 0 | 0 / 0 | 0 / 0 | -- / -- | 0 / - | - / 0 | - / 0 | 0/- / 0/- | + / 0 | ++ / 0 | + / 0 |
| **MIN 204** | 0 / 0 | 0 / 0 | -- / 0 | 0 / 0 | 0 / 0 | -- / - | 0 / + | - / 0 | - / 0 | 0 / 0 | 0 / 0 | + / 0 | + / 0 |
| **MIN 19 & 205** | + / 0 | 0 / 0 | 0 / 0 | 0 / 0 | -- / -- | - / 0 | 0 / - | --/ - | - / 0 | -/- / 0/- | + / 0 | - / + | + / 0 |
| **MIN 74** | +/ 0 | 0 / 0 | -- / 0 | 0 / 0 | -- / -- | - / 0 | 0 / - | -- / 0 | - / 0 | -/- / -/0 | + / 0 | ++ / 0 | + / 0 |
| **MIN 76** | + / 0 | 0 / 0 | -- / 0 | 0 / 0 | -- / - | - / 0 | 0 / + | - / 0 | - / 0 | -/- / 0/- | + / 0 | ++ / 0 | + / 0 |
| **MIN 77** | + / 0 | 0 / 0 | -- / 0 | 0 / 0 | - / - | - / 0 | 0 / 0 | -- / - | - / 0 | -/- / 0/- | + / 0 | ++ / 0 | + / 0 |
| **MIN 206** | + / 0 | 0 / 0 | - / 0 | 0 / 0 | - / - | - / 0 | 0 / - | 0 / 0 | 0 / 0 | -/- / 0 | + / 0 | ++ / 0 | + / 0 |
| **MIN 32** | ++ / 0 | 0 / 0 | -- / 0 | 0 / 0 | -- / -- | 0 / 0 | 0 / + | -- / - | - / 0 | 0/- / 0 | ++ / 0 | + / 0 | + / 0 |
| **MIN 40** | ++ / 0 | 0 / 0 | - / 0 | 0 / 0 | -- / -- | - / 0 | 0 / + | - / 0 | - / 0 | -/0 / 0 | ++ / 0 | ++ / 0 | + / 0 |
| **SIL 01** | ++ / 0 | 0 / 0 | 0 / 0 | 0 / 0 | - / - | - / 0 | 0 / + | 0 / 0 | - / 0 | 0 / 0 | ++ / 0 | ++ / + | + / 0 |

| Site | SA1 | SA2 | SA3 | SA4 | SA5 | SA6 | SA7 | SA8 | SA9 | SA10 | SA11 | SA12 | SA13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AOS E** | - / + | - / 0 | 0 / 0 | 0 / ? | - / - | - / 0 | 0 / ? | - / - | 0 / ? | - / 0/- | - / 0 | - / + | + / 0 |
| **AOS F** | - / + | - / 0 | 0 / 0 | 0 / ? | - / - | - / 0 | 0 / ? | - / - | 0 / 0 | - / 0/- | - / 0 | + / + | + / 0 |
| **AOS I** | - / + | - / 0 | 0 / 0 | 0 / ? | - / - | 0 / 0 | 0 / ? | 0 / 0 | 0 / 0 | - / 0/- | - / 0 | ++ / + | + / 0 |
| **AOS J** | - / + | - / 0 | 0 / 0 | 0 / ? | - / - | 0 / 0 | 0 / ? | 0 / 0 | 0 / 0 | 0 / 0 | - / 0 | ++ / + | + / 0 |
| **SIL 02** | + / 0 | 0 / 0 | 0 / 0 | 0 / 0 | -- / -- | - / 0 | 0 / ? | -- / - | - / - | -/- / 0/- | 0 / 0 | -- / 0 | + / 0 |
| **MIN 69** | ++ / 0 | 0 / 0 | -- / 0 | 0 / 0 | 0 / 0 | 0 / 0 | 0 / + | -- / - | - / 0 | 0/- / 0/- | ++ / 0 | ++ / 0 | + / 0 |
| **MIN 71** | ++ / 0 | 0 / 0 | -- / 0 | 0 / 0 | -- / -- | - / 0 | 0 / ? | - / - | - / 0 | 0/- / 0/- | ++ / 0 | ++ / 0 | + / 0 |
| **MIN 115** | ++ / 0 | - / 0 | 0 / 0 | 0 / 0 | 0 / 0 | - / 0 | 0 / ? | - / 0 | 0 / 0 | 0 / 0 | ++ / 0 | ++ / 0 | + / 0 |
| **MIN 207** | ++ / 0 | 0 / 0 | 0 / 0 | 0 / 0 | -- / -- | 0 / 0 | 0 / + | -- / - | 0 / 0 | 0/- / 0/- | ++ / 0 | ++ / 0 | + / 0 |
| **MIN 208** | + / 0 | 0 / 0 | - / 0 | 0 / 0 | - / - | - / 0 | 0 / + | - / - | - / 0 | 0/- / 0/- | + / 0 | ++ / 0 | + / 0 |
| **MIN 209** | + / 0 | 0 / 0 | - / 0 | 0 / 0 | -- / -- | - / 0 | 0 / + | - / 0 | - / 0 | - / 0/- | + / 0 | ++ / 0 | + / 0 |
| **MIN 210** | + / 0 | 0 / 0 | - / 0 | 0 / 0 | -- / -- | - / 0 | 0 / + | - / 0 | - / 0 | - / 0/- | + / 0 | ++ / 0 | + / 0 |
| **MIN 211** | + / 0 | 0 / 0 | -- / 0 | 0 / 0 | -- / -- | - / 0 | 0 / + | - / 0 | - / 0 | - / 0/- | - / 0/- | ++ / 0 | + / 0 |
| **MIN 25** | 0 / 0 | - / 0 | -- / 0 | 0 / 0 | -- / -- | - / 0 | 0 / + | - / 0 | - / 0 | - / 0/- | 0 / 0 | + / 0 | + / 0 |
| **MIN 92** | 0 / 0 | 0 / 0 | -- / 0 | 0 / 0 | 0 / 0 | - / 0 | 0 / + | -- / - | - / 0 | 0/- / 0/- | 0 / 0 | ++ / 0 | + / 0 |
| **MIN 212** | ++ / 0 | 0 / 0 | - / 0 | 0 / 0 | - / - | - / 0 | 0 / + | - / - | - / 0 | - / 0/- | ++ / 0 | -- / + | + / 0 |
| **MIN 79** | ++ / 0 | 0 / 0 | -- / 0 | 0 / 0 | - / - | 0 / 0 | 0 / + | - / 0 | - / 0 | - / 0 | ++ / 0 | 0 / 0 | + / 0 |
| **MIN 80** | ++ / 0 | 0 / 0 | 0 / 0 | 0 / 0 | -- / - | 0 / 0 | 0 / + | - / 0 | - / 0 | - / 0 | ++ / 0 | ++ / 0 | + / 0 |

**Table 6.2. Summary of Sustainability Effects of the proposed planning policies in the M&WLPR**

| Policy | SA1 | SA2 | SA3 | SA4 | SA5 | SA6 | SA7 | SA8 | SA9 | SA10 | SA11 | SA12 | SA13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MW1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **MW2** | + | + | + | + | ++ | + | + | ++ | + | ++ | + | ++ | + |
| **MW3** | + | + | + | + | 0 | 0 | 0 | + | 0 | 0 | + | 0 | +/- |
| **MW4** | ++ | ++ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ++ | 0 | ++ | 0 |
| **MW5** | 0 | 0 | 0 | 0 | 0 | ++ | 0 | + | + | 0 | 0 | 0 | +/- |
| **MW6** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ++ | 0 | ++ | 0 | 0 | +/0 |
| **WP1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | 0 | + |
| **WP2** | + | + | 0 | + | 0 | 0 | 0 | 0 | 0 | 0 | + | 0 | + |
| **WP3** | + | 0 | + | 0 | + | + | 0 | + | 0 | + | + | + | + |
| **WP4** | 0 | 0 | + | 0 | + | + | 0 | + | 0 | + | + | + | + |
| **WP5** | + | 0 | + | 0 | + | + | 0 | + | 0 | + | + | + | + |
| **WP6** | 0 | 0 | + | 0 | + | + | 0 | + | 0 | + | + | + | + |
| **WP7** | + | 0 | + | + | + | + | 0 | + | 0 | + | + | + | + |
| **WP8** | + | 0 | + | 0 | + | + | 0 | + | 0 | + | + | + | + |
| **WP9** | + | 0 | + | 0 | + | + | 0 | + | 0 | + | + | + | + |
| **WP10** | + | 0 | + | 0 | + | + | 0 | + | 0 | + | + | + | + |
| **WP11** | 0 | 0 | + | + | + | + | + | + | + | + | + | + | + |
| **WP12** | 0 | 0 | + | 0 | + | + | + | + | + | + | + | + | + |
| **WP13** | 0 | 0 | + | 0 | + | + | 0 | + | + | + | + | + | + |
| **WP14** | 0 | 0 | + | 0 | + | + | 0 | + | 0 | + | 0 | + | + |
| **WP15** | - | - | + | 0 | 0 | 0 | 0 | + | 0 | + | + | + | + |
| **WP16** | ++ | 0 | 0 | + | ++ | + | 0 | ++ | 0 | + | 0 | + | 0 |
| **WP17** | 0 | 0 | + | 0 | + | + | 0 | + | 0 | + | + | 0 | +/- |
| **MP1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | 0 | + |
| **MP2** | + | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | 0 | ++ |
| **MP3** | ++ | ++ | ? | 0 | ? | + | 0 | + | ? | + | ++ | 0 | + |
| **MP4** | 0 | + | + | 0 | + | + | 0 | + | + | + | + | + | + |
| **MP5** | 0 | 0 | ++ | 0 | + | ++ | + | ++ | + | + | 0 | ++ | +/- |
| **MP6** | 0 | + | + | + | + | + | 0 | + | + | + | 0 | + | -- |
| **MP7** | 0 | 0 | + | + | + | ++ | ++ | ++ | + | + | 0 | + | + |
| **MP8** | 0 | 0 | 0 | + | + | + | + | + | + | + | 0 | 0 | + |

| Policy | SA1 | SA2 | SA3 | SA4 | SA5 | SA6 | SA7 | SA8 | SA9 | SA10 | SA11 | SA12 | SA13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MP9** | + | 0 | + | 0 | + | + | 0 | + | 0 | + | + | + | + |
| **MP10** | ++ | ++ | + | 0 | + | + | 0 | + | 0 | + | + | 0 | +/- |
| **MP11** | 0 | 0 | + | 0 | + | + | 0 | + | 0 | + | + | 0 | +/- |
| **MP12** | - | 0 | + | 0 | + | + | 0 | + | 0 | + | + | 0 | + |
| **MP13** | + | + | + | 0 | + | + | + | + | 0 | + | ++ | + | ++ |

## 7. Task B5: Mitigation of Adverse Effects and Maximising Benefits

### 7.1 Recommendations and mitigation

In accordance with SA guidance, measures to prevent, reduce or offset significant adverse effects of implementing the Norfolk Minerals and Waste Local Plan Review have been considered. General mitigation measures are addressed in Tables 7.1 and 7.2 below, with measures for sites and areas of search set out in the individual site and area assessments. Typically these might include requirements for particular HGV routing arrangements, advanced planting of boundary trees and a restoration scheme including particular habitat creation/ re-creation. Appropriate location of mineral extraction sites and waste management facilities is the most significant way that potential impacts can be mitigated.

The mitigation measures in Table 7.2 are relevant to all waste management operations, unless otherwise specified.

**Table 7.1 Possible mitigation measures for mineral extraction sites**

| SA Objective | Possible mitigation measures |
|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | Research possible renewable energy sources to power activities at the site. Consider offsetting the $CO_2$ release through a legitimate project. Consider carbon capture of operational $CO_2$ release. |
| SA2: To improve air quality in line with the National Air Quality Standards | Increased traffic volumes will result in an increase in exhaust fumes (e.g. $NO_x$, $PM_{10}$ etc.) in the immediate vicinity. Fumes can be reduced on site by employing an on-site speed limit and ensuring engines are turned off when stationary. |
| SA3: To minimise noise, vibration and visual intrusion | Ensure adequate bunds/screens/planting against noise, vibration and visual impact are erected while the site is in operation / in construction. Monitor noise to ensure that it does not exceed the relevant noise level limit.<br>Design bunds/ screening to be sensitive to the surrounding area to reduce visual impact. Structures should be placed where they will have the least impact. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | Mineral extraction sites are unlikely to provide improved access to services and facilities and reduce social exclusion. |
| SA5: To maintain and enhance the character of the townscape and historic environment | Effects on nearby heritage assets can be reduced/avoided with careful design of the extraction site.<br>Having special regard to the protection of the historic environment, only where potential impacts can be successfully mitigated is an extraction site likely to be found acceptable.<br>Archaeological investigations are usually required prior to mineral extraction.<br>Location of access routes, large plant and obtrusive structures should be placed to avoid impact on the townscape and historic environment. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | Carry out ecological surveys of the site prior to development and act upon suggestions for limiting impacts to local biodiversity. For example, the protection of certain habitats, such as veteran trees, or the provision of compensatory habitat.<br>If mineral extraction is proposed below the water table and/or dewatering is proposed as part of the extraction operations, the impact of this activity on biodiversity must also be assessed and mitigated appropriately. For example, through |

| SA Objective | Possible mitigation measures |
|---|---|
| | artificial recharge of the groundwater levels. Schemes of working should take into account geodiversity by permitting access for recording and sampling during the active phase, and retaining geological sections for scientific and educational study, and potentially also benefit biodiversity, in the restoration phase. |
| SA7: To promote innovative solutions for the restoration and afteruse of minerals sites | Mineral extraction is a temporary use of land. Development associated with mineral extraction would only be permitted for the life of the mineral extraction operation. The proposed restoration scheme should be beneficial to the area after extraction is finished, in terms of landscape, biodiversity, geodiversity and public access. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | Location of access routes, large plant and obtrusive structures should be placed to minimise impact on the countryside and landscape.<br>Screening against noise, vibration and visual intrusion should be appropriate to the local area. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk. | Mitigation measures against dust release from mineral extraction and processing must be employed on the site. These are likely to including installing windbreaks, irrigation systems and wheel washing.<br>Increased traffic volumes will result in an increase in exhaust fumes (e.g. NOx, PM10 etc.) in the immediate vicinity. Fumes can be reduced on site by employing an on-site speed limit and ensuring engines are turned off when stationary.<br>The route taken by HGVs from the extraction site onto the strategic highway network should avoid unsuitable roads. Junction or highway improvements may be required or off-highway haul routes may be required to enable a suitable route to be provided. |
| SA10: To protect and enhance water and soil quality in Norfolk | Design drainage systems for the site to deal with any run-off, preventing it from reaching any nearby watercourse or drinking water source. Include bunds and sumps where necessary.<br>Any agriculturally valuable land on site will be temporarily unavailable as a result of extraction. Soils should therefore be suitably stored and replaced as part of the site restoration. A well designed restoration scheme may reduce the long term impacts of development on the site. |
| SA11: To promote sustainable use of minerals resources | N/A. The purpose of the mineral extraction operation would be to provide mineral resources. |
| SA12: To reduce the risk of current and future flooding at new and existing development | Incorporate flood mitigation measures such as bunding, into the design of the development to reduce, or avoid, issues with flooding.<br>Where sites or areas are within flood risk zones 3 or 2 or over 1 hectare in size, carry out a full flood risk assessment prior to development and act upon suggestions for limiting the impact of flooding on-site and off-site. |
| SA13: To encourage employment opportunities and promote economic growth | The supply of mineral resources is required in the construction industry (sand and gravel and carstone) and in glass manufacture (silica sand). Therefore the provision of mineral extraction sites will contribute to employment and economic growth. |

**Table 7.2 Possible mitigation measures for waste management sites**

| SA Objective | Possible mitigation measures |
|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | In-vessel composting limits the release of emissions (such as Volatile Organic Compounds (VOCs), ammonia and particulates) due to the contained nature of the composting process.<br>Operation of an anaerobic digestion facility will produce biogas rich in $CH_4$ and $CO_2$. This can be used as a replacement for fossil fuels in energy generation.<br>Operation of a thermal treatment facility may produce syngas rich in carbon monoxide and hydrogen. This can be used as a replacement for fossil fuels in energy generation.<br>However thermal treatment processes also produce $CO_2$, $CH_4$ and other hydrocarbon gases which will require monitoring.<br>Operation and construction of a landfill site will involve $CO_2$ and landfill gas release if the site is accepting biodegradable waste. Landfill gas should be collected and used to generate electricity.<br>Construction and operation of a waste management site will involve $CO_2$ release, through on-site operations and vehicle movements. Consider offsetting construction release through a legitimate project. |
| SA2: To improve air quality in line with the National Air Quality Standards | Increased traffic volumes will result in an increase in exhaust fumes (e.g. NOx, PM10 etc.) in the immediate vicinity. Fumes can be reduced on site by employing an on-site speed limit and ensuring engines are turned off when stationary. |
| SA3: To minimise noise, vibration and visual intrusion | Ensure suitable building design and adequate bunds/screens/ planting against noise, vibration and visual impact are erected while the site is operation / in construction.<br>Design screening to be sensitive to the surrounding area to reduce visual impact. Structures should be placed where they will have the least impact. Structure design should also be of minimum impact. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | N/A, except for household waste recycling centres (HWRCs). HWRCs are publicly accessible. Access to the site can be improved by carrying out appropriate road improvements (such as widening, improving junctions etc.). These measures would require separate site specific assessment.<br>A one-way system could also be implemented on the site where the public enter the site through once entrance and leave via a separate exit. The location of HWRCs in relation to population centres can improve accessibility, and the internal design of HWRCs, such as height and location of areas for waste collection can also improve accessibility. |
| SA5: To maintain and enhance the character of the townscape and historic environment | Effects on nearby listed buildings can be reduced/avoided with careful design of the constriction phase of the site.<br>Having special regard to the protection of the historic environment, only where potential impacts can be successfully mitigated is an extraction site likely to be found acceptable.<br>Archaeological investigations may be required prior to the development of a new waste management facility.<br>Location of access route, large plant and obtrusive structures should be placed to avoid impact on the townscape and cultural heritage. |

| SA Objective | Possible mitigation measures |
|---|---|
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | Carry out ecological surveys of the site prior to development and act upon suggestions for limiting impacts to local biodiversity.<br>For landfill sites, schemes of working should take into account geodiversity by permitting access for recording and sampling during the active phase. |
| SA7: To promote innovative solutions for the restoration and afteruse of waste sites | Proposed restoration schemes will only mitigate negative impacts if the proposed waste management facility is in place temporarily.<br>Landfill operations usually take place as part of the restoration of a quarry. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | Location of access route, large plant and obtrusive structure should be placed to minimise impact on the countryside and landscape.<br>Screening against noise, vibration and visual impacts should be appropriate to the local area. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk. | Carrying out waste management operations in a building where appropriate will reduce emissions to air affecting local communities.<br>Mitigation measures against dust release must be employed on the site. These are likely to include installing windbreaks, irrigation systems, wheel washing and covered work areas.<br>In-vessel composting allows for the odour emissions to be controlled with bio-filters within the buildings, limiting the loss in amenity of local communities.<br>Odour from landfills taking degradable waste must be controlled through odour management systems, so as not to impact upon the surrounding communities. Good leachate management practices will also reduce odour.<br>Increased traffic volumes will result in an increase in exhaust fumes (eg NOx, CO etc) in the immediate vicinity. Fumes can be reduced on site by employing an on-site speed limit and ensuring engines are turned off when stationary. |
| SA10: To protect and enhance water and soil quality in Norfolk | Design sealed drainage systems for the site to deal with run-off preventing it from reaching any nearby watercourse or drinking water source.<br>Landfill sites must be engineered in accordance with the appropriate regulations to contain the waste and reduce potential pollution to water and soil. If leachate is removed from landfill sites, suitable treatment and discharge methods must be used to ensure that leachate does not enter watercourses or drinking water sources, due to its highly polluting nature.<br>If the site is on agriculturally valuable land, which will be lost with the development, a well-designed restoration scheme may reduce the long term impacts of development on the site, but is only applicable to temporary site usage. If the site will take place on land previously used for quarry operations, and does not delay agreed site restoration, then there will be no additional land lost. |
| SA11: To promote sustainable use of waste resources | For waste transfer stations, mixed waste processing facilities and HWRCs ensure that waste that can be recovered |

| SA Objective | Possible mitigation measures |
|---|---|
| | /recycled is separated at the site and only waste that cannot be recovered/recycled is sent for disposal.<br>Composting, anaerobic digestion and recycling facilities will be recycling and recovery waste, therefore no mitigation is required. Thermal treatment facilities should ensure that as much recyclable waste as practicable is separated before or after (in the case of metals) treatment, to ensure waste is treated as far up the waste hierarchy as possible. Waste should be pre-treated prior to landfill, to ensure waste is managed as far up the waste hierarchy as possible. |
| SA12: To reduce the risk of current and future flooding at new and existing development | Incorporate flood mitigation measures such as bunding, into the design of the development to reduce or avoid flood risk issues.<br>Where sites are within flood zones 3 or 2 or over 1 hectare in size carry out a site specific flood risk assessment prior to development and act upon suggestions for limiting the impact of flooding on-site and off-site. |
| SA13: To encourage employment opportunities and promote economic growth | There are opportunities for employment in waste management facilities. Recycling and recovery operations can generate increased levels of economic growth compared to landfill sites, as these facilities can also provide secondary materials which are marketable, and/or fuel or increased levels of energy generation. |

## 8. Task B6: Monitoring Proposals

### 8.1 Proposals for monitoring the Norfolk Minerals and Waste Local Plan

Section 35 of the Planning and Compulsory Purchase Act 2004 (amended by the Localism Act 2011) requires every local planning authority to prepare a Monitoring Report. This should contain information on the implementation of the Local Development Scheme and the extent to which the policies in the adopted Minerals and Waste Local Plan are being achieved.

Additionally, the Sustainability Appraisal on the Norfolk Minerals and Waste Local Plan must also be monitored and reported in accordance with the SEA Regulations. This allows for the effects of the implementation of the Local Plan on sustainability to be continuously monitored against the sustainability baseline. Monitoring of the SA will be integrated into the Minerals and Waste Local Plan Monitoring Reports.

The monitoring report will describe any changes to the sustainability baseline arising from the implementation of the Norfolk Minerals and Waste Local Plan, and how the County Council will work to mitigate any adverse effects identified. The SA/SEA process has assisted in developing a framework for monitoring. Indicators have been developed which will be used to monitor implementation of the Minerals and Waste Local Plan, to check whether policies are delivering the predicted effects. The monitoring process will incorporate the following:

- Geographic Information Systems (GIS);
- Comparison of the current state against the baseline;
- Analysis of changes to indicators (positive or negative); and
- Analysis of performance against targets and objectives.

Table 8.1 below describes the envisaged monitoring regime for this SA/SEA. The table describes which indicators will be reviewed and when this information will be collected. It also delineates which indicators are contextual (denoted by a 'C'), relating to the general state of the environment, and which are related directly to and/or affected by the performance of the plan (denoted by a 'P'). The baseline data in this table is for the period from 1 April 2016 to 31 March 2017 unless otherwise specified.

Data on the number of sites located within the specified proximity of environmental and landscape designations are for safeguarded sites only. Safeguarded mineral and waste sites are those considered to be significant enough to the county's mineral or waste capacity that they should be offered a degree of protection under policy CS16. This means that smaller sites are not currently included in the assessment of these indicators.

Please note that whilst some sites may be within the indicator distance of environmental, landscape, or historic environment designations, this does not indicate that an adverse effect on the designations is expected.

**Table 8.1**

| SA Objective | Type | Indicator | Baseline |
|---|---|---|---|
| SA1. To adapt and mitigate the effects of climate change by reducing contributions to climate change | P | Carbon dioxide emissions by Local Authority Area | http://naei.beis.gov.uk/data/local-authority-co2-map<br>7,153 kt generated in Norfolk (2005)<br>6,559 kt generated in Norfolk (2013) |
| SA2: To improve air quality in line with the National Air Quality Standards | C | Area of AQMAs in Norfolk | The total area of all AQMAs in Norfolk is 282.3 hectares, the largest of which covers 274.6 hectares of Norwich City centre. (AMR 2017) |

| SA Objective | Type | Indicator | Baseline |
|---|---|---|---|
| | P | Number of minerals and waste management sites within an AQMA | None |
| SA3: To minimise noise, vibration and visual intrusion | P | Number of substantiated complaints about amenity impacts from minerals and waste activities | 15 complaints (AMR 2017) |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | C | Index of multiple deprivation: % lower super output areas in Norfolk in the 20% most deprived nationally | 9.6% (2010) |
| | C | Employment Deprivation: % lower super output areas in Norfolk in the 10% most deprived nationally | 6.4% (2010) |
| SA5: To maintain and enhance the character of the townscape and historic environment | P | Number of minerals or waste sites within 250 metres of a Listed Building | 15 safeguarded mineral sites<br>3 safeguarded waste sites<br>22 water Recycling Centres<br>(AMR 2017) |
| | P | Number of minerals or waste sites within 250 metres of a Scheduled Monument | 7 Safeguarded mineral sites<br>6 Safeguarded waste sites<br>2 Water Recycling Centres<br>(2017) |
| | P | Number of minerals or waste sites within 250 metres of a Conservation Area | 6 safeguarded mineral sites<br>7 safeguarded waste sites<br>11 Water Recycling Centres<br>(AMR 2017) |
| | P | Number of minerals or waste sites within 250 metres of an historic park or garden | 0 safeguarded mineral sites<br>0 safeguarded waste sites<br>1 Water Recycling Centre<br>(AMR 2017) |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | P | Number of minerals or waste sites within 2km of a SSSI | 40 safeguarded mineral sites<br>46 safeguarded waste sites<br>28 Water Recycling Centres<br>(AMR 2017) |
| | P | Number of minerals or waste sites within 5km of a Special Protection Area (SPA) | 14 safeguarded mineral sites<br>28 safeguarded waste sites<br>21 Water Recycling Centres<br>(AMR 2017) |
| | P | Number of minerals or waste sites within 5km of a Special Area of Conservation (SAC) | 33 safeguarded mineral sites<br>43 safeguarded waste sites<br>33 Water Recycling Centres<br>(AMR 2017) |
| | P | Number of minerals or waste sites within 5km of a Ramsar site | 13 safeguarded mineral sites<br>20 safeguarded waste sites<br>17 Water Recycling Centres |
| | P | Number of minerals or waste sites within 2km of a National Nature Reserve (NNR) | 0 safeguarded mineral sites<br>4 safeguarded waste site<br>8 Water Recycling Centres |
| | P | Number of minerals or waste sites within 250 metres of a Local Nature Reserve | 0 safeguarded mineral sites<br>1 safeguarded waste site<br>2 Water Recycling Centres |

| SA Objective | Type | Indicator | Baseline |
|---|---|---|---|
| | P | Number of minerals or waste sites within 250 metres of a County Wildlife Site | 23 safeguarded mineral sites<br>9 safeguarded waste sites<br>22 Water Recycling Centres<br>(AMR 2017) |
| | P | Number of minerals or waste sites within 250 metres of a County Geodiversity site | 1 safeguarded mineral site<br>0 safeguarded waste sites<br>0 Water Recycling Centres<br>(AMR 2017) |
| | P | Number of planning permissions granted contrary to biodiversity or geodiversity objections from statutory consultees | 0 (2016/17) |
| SA7: To promote innovative solutions for the restoration and afteruse of minerals and waste sites | P | % of mineral workings covered by progressive restoration schemes. | All new permissions (2013/14)<br>All new permissions (2014/15)<br>All new permissions (2015/16)<br>No new mineral extraction sites were permitted in 2016/17 |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | P | Number of minerals or waste sites within 250 metres of an ancient woodland | 5 safeguarded mineral sites<br>1 safeguarded waste site<br>2 Water Recycling Centres<br>(2017) |
| | P | Number of minerals or waste sites within the AONB | 2 safeguarded mineral sites<br>3 safeguarded waste sites<br>6 Water Recycling Centres<br>(AMR 2017) |
| | P | Number of minerals or waste sites within the Heritage Coast Area | None (AMR 2017) |
| | P | Number of minerals or waste sites within the Broads Authority Executive Area | 1 safeguarded mineral site<br>2 safeguarded waste sites<br>4 Water Recycling Centres<br>(AMR 2017) |
| | P | Number of minerals or waste sites within a Core River Valley | 9 safeguarded mineral sites<br>7 safeguarded waste sites<br>12 Water Recycling Centres<br>(AMR 2017) |
| | P | Number of planning permissions granted contrary to landscape objections from statutory consultees | 0 (2014) |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | C | % lower super output areas in Norfolk in the 10% most health deprived nationally | 2.45% (IMD 2010) |
| | C | % lower super output areas in Norfolk in the 10% most living environment deprived nationally | 3.0% (IMD 2010) |
| SA10: To protect and enhance water and | C | % land classified as Grade 1, 2 or 3 agricultural land. | 78.6% |

| SA Objective | Type | Indicator | Baseline |
|---|---|---|---|
| soils quality in Norfolk | P | Number of minerals or waste sites in Grade 1 or 2 agricultural land | 3 safeguarded mineral sites<br>10 safeguarded waste sites<br>10 water recycling centres (2017) |
| | P | Number of minerals or waste sites within Groundwater Protection Zone 1 | 3 safeguarded mineral sites<br>5 safeguarded waste sites<br>1 Water Recycling Centre (AMR 2017) |
| | P | Number of planning permissions granted contrary to Environment Agency advice on water quality grounds | 0 (2016/17) |
| SA11: To promote sustainable use of minerals and waste resources | P | Sand and gravel:<br>Production – tonnes<br>10 year sales average – tonnes<br>Permitted reserve – tonnes<br>Landbank – years | <br>1.62mt (2016)<br>1.41mt (2016)<br>16.54mt (2016)<br>11.8 years (December 2016) |
| | P | Carstone:<br>Production – tonnes<br>10 year sales average – tonnes<br>Permitted reserve – tonnes<br>Landbank - years | <br>106,438t (2016)<br>98,839t (2016)<br>2.05mt (2016)<br>20.7 years (December 2016) |
| | P | Silica sand<br>3 year sales average – tonnes<br>10 year sales average – tonnes<br>Permitted reserve – tonnes<br>Landbank - years | <br>785,400t (2016)<br>681,900t (2016)<br>2.6mt (2016)<br>3.3 years (December 2016) |
| | P | % Local Authority Collected Waste:<br>- Recycling<br>- Composted<br>- Energy recovered<br>- Refuse Derived Fuel<br>- Landfilled | (2016/17)<br>Recycled: 26.5%<br>Composted 19.8%<br>energy recovery 9.4%<br>RDF 39.1%<br>Landfill 2.1%<br>Other 2.8% |
| | P | Local Authority Collected Waste arisings (tonnes) | 425,657 (2016/2017) |
| SA12: To reduce the risk of current and future flooding at new and existing development | P | Number of planning permissions granted contrary to the advice of the Environment Agency or Norfolk County Council as Lead Local Flood Authority, on flood risk grounds | 0 (2016/17) |
| SA13: To encourage employment opportunities and promote economic growth | C | Unemployment rate (persons aged 16-64) | 4.3% (Dec 2017) |

## 9. Glossary

**Air Quality Management Areas (AQMAs):** Areas designated by local authorities because they are not likely to achieve national air quality objectives by the relevant deadlines.

**Aftercare:** The treatment of land for a period (usually five years) following restoration to bring the land to the required standard so that it is fit for its agreed after-use.

**Afteruse:** the use (usually for agriculture, forestry or amenity) that land is put to once restored following mineral working, or temporary waste management operations such as landfill.

**Aggregates:** Materials such as sand and gravel and crushed rock, used in the construction industry for purposes such as concrete, mortar or roadstone.

**Agricultural waste:** Waste that is specifically generated by agricultural activities. It includes manure and other wastes from farms, poultry houses and slaughter houses; harvest waste, and pesticides.

**Amenity:** a positive element or elements that contribute to the overall character or enjoyment of an area.

**Anaerobic Digestion:** Anaerobic digestion is the biological treatment of biodegradable organic waste in the absence of oxygen, utilising microbial activity to break down the waste in a controlled environment. Anaerobic digestion results in the generation of:
- Biogas, which is rich in methane and can be used to generate heat and/or electricity;
- Fibre, (or digestate) which is nutrient rich and can potentially be used as a soil conditioner; and
- Liquor, which can potentially be used as a liquid fertiliser.

**Ancient woodland:** An area of woodland which has had a continuous history of tree cover since at least 1600.

**Apportionment:** The quantity of land-won aggregates to be planned for in Norfolk, taking into account the Local Aggregate Assessment, the advice of the East of England Aggregate Working Party and published National and Sub-National Guidelines on future provision of aggregates. Further information on planning for a steady and adequate supply of aggregates is contained in paragraph 145 of the National Planning Policy Framework and 'Guidance on the Managed Aggregate Supply System' (DCLG 2012).

**Appropriate Assessment:** *Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora* requires an Appropriate Assessment to be undertaken to assess the impacts of a land-use plan against the conservation objectives of a European Site and to ascertain whether it would adversely affect the integrity of that site.

**Area of Outstanding Natural Beauty (AONB):** designated under the National Parks and Access to the Countryside Act 1949 for the purposes of preserving and enhancing their natural beauty.

**Area of Search:** areas where knowledge of mineral resources may be less certain but within which planning permission may be granted, particularly if there is a potential shortfall in supply. If it is not possible to designate Specific Sites, or Preferred Areas, the alternative way to plan for the steady and adequate supply of minerals is to designate Areas of Search.

**Biodegradable waste:** any waste that is capable of undergoing natural decomposition, such as food and garden waste, paper and cardboard.

**Biodiversity:** The variety of all life on earth (mammals, birds, fish, invertebrates, plants etc).

**Borrow pit:** A temporary mineral working to supply material for a specific construction project.

**Buffer:** Buffers are areas of land within the allocation which would remain unworked for mineral extraction to mitigate potential impacts (for example, on amenity, landscape or ecology). The exact distances and coverage of any buffer, if required, would be determined following assessment of the detail of potential impacts as part of any future planning application.

**Carstone:** Carstone is a ferrunginous brown sandstone quarried in West Norfolk. It is used primarily for construction fill. When the iron content is high it can meet higher specifications. Traditionally in West Norfolk it was used as a building material.

**Climate change:** Changes in climate resulting from an increase in greenhouse gases in the atmosphere (e.g. emissions from transport and industry), global changes to land surface, such as from deforestation, and an increase in atmospheric concentrations of aerosols.

**Composting:** A process where organic wastes (such as garden and kitchen waste) are broken down aerobically (in the presence of air) to create a product that can be applied to land to improve soil structure and enrich the nutrient content of the soil.

**Conservation Area:** An area designated by the Local Planning Authority under the Planning (Listed Buildings and Conservation Areas) Act 1990 as possessing special architectural or historical interest.

**Conventional hydrocarbons:** Hydrocarbon extraction covers both conventional and unconventional hydrocarbons. Conventional hydrocarbons are oil and gas where the reservoir is sandstone or limestone. Also see unconventional hydrocarbons.

**Construction, Demolition and Excavation waste (CD&E):** CD&E waste can be in the form of certain types of: Construction wastes (e.g. surplus supplies of materials specifically required for a single project as well as waste originating from site preparation), Demolition wastes (e.g. used material resulting from demolition activities); or Excavation wastes (e.g. usually consisting of soils and stones which cannot be used beneficially, such as from tunnelling operations, the soil component may not be inert).

**Commercial and industrial waste (C&I):** Waste from shops, industrial and business premises.

**County Wildlife Site:** A site of local importance for wildlife. Outside SSSIs, County Wildlife Sites are the best sites for wildlife in Norfolk. Sites are designated using stringent criteria, by a committee composed of the Norfolk Wildlife Trust, Norfolk County Council, Natural England, the Norfolk Biological Records Centre, and the Norfolk Biodiversity partnership.

**Cumulative Impact:** The combined impacts of a number of developments on the environment, amenity, health, traffic etc.

**Development Management:** The process through which the Council determines whether a proposal for development should be granted planning permission, taking into account the development plan and any other material considerations.

**Development Plan:** This includes adopted Local Plans and neighbourhood plans and is defined in section 38 of the Planning and Compulsory Purchase Act 2004 (as amended) that set out the planning policies and proposals for the development and use of land. Decisions on planning applications must conform to the Development Plan, unless material considerations indicate otherwise.

**Development Plan Documents:** A term brought in by the Planning and Compulsory Purchase Act 2004. They set out spatial planning policies and proposals for an area. Development Plan Documents are also referred to as Local Plans.

**Development Framework:** Collective term for the Development Plan Documents, the Local Development Scheme, the Statement of Community Involvement, Annual Monitoring Report, and any supplementary planning documents.

**Disposal:** Waste disposal operations include: deposit into or onto land (e.g. landfill), incineration, permanent storage, treatment operations where the final compound or mixture will be disposed of.

**Ecological network:** Areas of semi-natural habitat that are linked by corridors or “stepping stones”, and thus enable wildlife to move through the wider landscape.

**Energy from Waste (EfW):** Utilising the embodied energy of waste materials to generate electricity and heat through direct combustion or indirect combustion of biogas.

**Energy recovery:** The generation of heat and power from the thermal treatment of waste, the production of fuels from other forms of treatment and the combustion of landfill gas and gas from anaerobic digestion to create electricity.

**Examination:** The Local Plan will be subject to an independent examination by an independent planning inspector. The recommendations in the Inspectors report will inform the final adopted version, but are no longer legally-binding.

**Gasification:** A process whereby carbon based wastes are heated in the presence of air or steam to produce fuel-rich gases.

**Geodiversity:** The variety of rocks, minerals, fossils, soils and landforms, together with the natural processes which shape the landscape.

**Geomorphology:** The study of landforms and the formative processes that shape the physical landscape.

**Green Infrastructure:** A network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities.

**Greenhouse gas:** Gases such as carbon dioxide and methane which, when their atmospheric concentrations exceed certain levels, can contribute to climate changes buy forming a barrier in the earth's atmosphere that traps the sun's heat.

**Groundwater Source Protection Zone:** The Environment Agency divides groundwater source catchments into four zones. These are based on the number of days taken by any pollutant to flow to the potable water abstraction borehole. Source protection Zone 1 is defined as a zone within which any contamination would reach the borehole within 50 days. This applies to groundwater at and below the watertable. This zone has a minimum 50 metre protection radius around the borehole. These zones are designed to provide control over activities taking place near boreholes which could result in contamination reaching the public water supply.

**Groundwater:** Water within soil, sediments or rocks below the ground surface. Water contained within underground strata is referred to as an aquifer.

**Habitats Regulations Assessment (Appropriate Assessment):** *Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora* requires an Appropriate Assessment to be undertaken to assess the impacts of a land-use plan against the conservation objectives of a European Site and to ascertain whether it would adversely affect the integrity of that site.

**Hazardous waste:** As defined by The List of Wastes Regulations 2005, eg asbestos, acids, oils, petroleum products, paint, mercury, solvents, un-depolluted end-of-life vehicles. It is waste that poses potential threats to public health or the environment (when improperly treated, stored, transported or disposed). This can be due to the quantity, concentration or characteristics of the waste. This type of waste includes elements of healthcare waste.

**Heritage asset:** A World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation.

**Historic Environment:** All aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora

**Historic Parks and Gardens:** Sites included in the *Register of Parks and Gardens of special historic interest in England,* compiled by Historic England via the Historic Buildings and Ancient Monuments Act 1953. The main purpose of this register is to help ensure that the features and qualities which make the landscapes registered to be of national importance are safeguarded during ongoing management or if any change is being considered which could affect them.

**Household waste** Household waste includes all mixed waste that is collected from households; all materials taken to local bring banks or collected at the doorstep or kerbside for recycling and composting; all waste (apart from rubble) that is taken to the County Council operated Recycling Centres; litter and street sweepings.

**Household waste recycling centres:** Provided by Waste Disposal Authorities as places where the public can deliver their household waste for recycling or disposal. These sites usually incorporate skips, collection areas for waste refrigeration and metal appliances, and recycling banks. Some sites have containers for materials such as waste batteries, paint, oil and wood. These facilities do not generally accept trade waste.

**Inert waste:** Waste that does not undergo any significant physical, chemical or biological, transformations; does not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health; and, in particular, does not endanger the quality of any surface water or groundwater.

**Inert waste recycling:** Includes the recycling of secondary aggregates at centralised processing facilities or where the material arises. Material is delivered by skip or bulk vehicle for crushing, screening and grading for re-use. Unusable residues may be used in landfill engineering. Hardstanding is required for stockpiles of material, and for locating crushing, screening and grading machinery. Some elements of the operation and storage may be enclosed, but it is mostly undertaken in the open air.

**In-Vessel Composting:** The aerobic decomposition of shredded and mixed organic waste within an enclosed container, where the control systems for material degradation are fully automated. Moisture, temperature and odour can be regulated, and a stable compost can be produced much more quickly than outdoor windrow composting.

**Initial Consultation:** A stage of the Local Plan preparation process where community engagement is sought from individuals and organisations to inform the identification of key issues and the potential options for addressing them.

**Landbank:** A stock of mineral reserves with planning permission for their extraction.

**Landfill:** The term landfill relates to waste disposal mainly below ground level whereas landraise, also generically referred to as landfill, refers to waste disposal mainly above pre-existing ground levels. Modern landfill practice requires a significant degree of engineering in order to contain the waste, control emissions and minimise potential environmental effects. The primary by-products of landfilling, where biodegradable materials are disposed of, are landfill gas and leachate (a liquor resulting from water passing through the waste mass) and much landfill engineering is geared towards dealing with these substances. As such, landfill sites require containment lining systems and abstraction systems for both landfill gas and leachate.

**Landfill gas:** A by-product from the decomposition of biodegradable wastes. The gas is a mixture of up to 65% methane and 35% carbon dioxide plus trace gases and vapours.

**Landscape character:** A distinct and consistent pattern of elements in the landscape that makes one landscape different to another.

**Leachate:** A liquor resulting from water passing through the waste mass and therefore containing contaminants.

**Listed building:** A building or other structure officially designated as being of special architectural, historical or cultural significance using provisions under the Planning (Listed Buildings and Conservation Areas) Act 1990. A listed building may not be demolished, extended or altered without special permission being granted by the Local Planning Authority. The Local Planning Authority must also consider if development nearby could cause adverse impacts to the listed building, and whether mitigation could address these impacts.

**Local Authority Collected Waste (LACW):** Waste collected from households and some business premises by local authorities, including waste from household waste recycling centres, public parks and public bins.

**Local Development Scheme:** Describes the Local Development Documents which the authority intends to prepare and the timetable for their preparation.

**Local Planning Authority:** An organisation with statutory planning powers, ie the relevant County, District, Borough or Unitary Council.

**Local Plan:** The plan for the future development of the local area, drawn up by the local planning authority in consultation with the community. In law this is described as the development plan documents adopted under the Planning and Compulsory Purchase Act 2004 (as amended). Current core strategies or other planning policies, which under the regulations would be considered to be development plan documents, form part of the Local Plan. The term includes old policies which have been saved under the 2004 Act.

**Materials Recovery Facility:** A specialised building for separating, processing and storing recyclable materials from waste collected either separately or mixed.

**Mechanical Biological Treatment (MBT):** A form of waste processing facility that combines a sorting facility (the 'mechanical' element) with a form of biological treatment such as composting or anaerobic digestion.

**Methane:** A colourless, odourless, flammable gas, formed during the decomposition of biodegradable waste.

**Mineral Consultation Area:** An area identified in order to ensure consultation between the relevant LPA and the Mineral Planning Authority before certain non-mineral planning applications made within the area are determined.

**Mineral Safeguarding Area:** An area designated by Minerals Planning Authorities which covers known deposits of minerals which are desired to be kept safeguarded from unnecessary sterilisation by non-mineral development.

**Mineral Planning Authority:** An organisation with statutory planning powers relating to minerals development, in most areas the County or Unitary Council.

**Mitigation:** Measures to reduce, avoid or remedy any adverse impacts caused by development.

**Monitoring Report:** Records progress in implementing the Local Development Scheme and the performance of policies against targets in the Local Plan. Indicates what action an authority needs to take if it is not on track or policies need to be revised/ replaced.

**Municipal Waste:** Waste arising from households as well as other waste (such as commercial and industrial waste) which because of its nature or composition is similar to waste from households.

**National Planning Policy Framework:** This document sets out the Government's planning policies for England and was published on 27 March 2012. The NPPF must be taken into account in the preparation of Local and neighbourhood Plans, and is a material consideration in planning decisions. It states that in order to be considered sound a Local Plan should be consistent with national planning policy.

**National Planning Practice Guidance (PPG):** A web-based resource published by the Department for Communities and Local Government (DCLG) on 6 March 2014 and updated as needed. It is available at: https://www.gov.uk/government/collections/planning-practice-guidance

**Non-hazardous waste:** All non-hazardous waste as defined by The List of Wastes Regulations 2005. Included are for example municipal (household), commercial and industrial wastes.

**Permitted reserves:** Saleable minerals in the ground with planning permission for extraction. Usually expressed in million tonnes.

**Planning conditions:** Conditions attached to a planning permission for the purpose of regulating and controlling the development.

**Preferred Areas:** If it is not possible to designate Specific Sites, the next way to plan for a steady and adequate supply of minerals is to designate preferred areas, which are areas of known resources where planning permission might reasonably be anticipated. Such areas may also include essential operations associated with mineral extraction.

**Preferred options:** A stage of the Local Plan preparation process where the authority's preferred options for addressing key issues are published for a six week consultation period. This stage was deleted in the revision to PPS12, published in 2008.

**Primary aggregates:** Naturally occurring sand, gravel and crushed rock used for construction purposes.

**Principal Aquifers:** These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

**Ramsar Site:** A Site of Special Scientific Interest of international importance as waterfowl habitat designated under the Ramsar International Convention on Wetlands (1971).

**Recovery:** Includes recycling and composting operations as well as anaerobic digestion, thermal treatment operations which produce energy from waste (including fuel, heat and power) and some backfilling operations.

**Recycled aggregates:** Aggregates produced from recycled construction waste such as crushed concrete, planings from road surfacing etc.

**Recycling:** The process by which materials are collected and used as 'raw' materials for new products.

**Refuse Derived Fuel (RDF):** consists of residual waste that complies with the specifications in a written contract between the producer of the RDF and a permitted end-user for the thermal treatment of the waste in an energy from waste facility or a facility undertaking co-incineration such as cement and lime kilns. The written contract must include the end-user's technical specifications relating as a minimum to the calorific value, the moisture content, the form and quantity of the RDF.

**Renewable energy:** Renewable energy is energy derived from resources that are regenerative (e.g. biomass) or for all practical purposes cannot be depleted (e.g. solar or wind power).

**Residual waste:** The elements of the waste streams that remain following recovery, recycling or composting operations.

**Restoration:** Operations designed to return an area to an acceptable environmental state, whether for the resumption of the former land use or for a new use following mineral working. Involves the reinstatement of land by contouring, the spreading of soils or soil making materials etc.

**Route hierarchy:** Norfolk County Council's route hierarchy categorises roads by use, or desired use, influencing signage, improvement programmes, and maintenance priorities. At the top of the hierarchy are the:

- Principal Roads (generally A roads); followed by
- Distributor Roads (generally B roads); followed by
- Local Access
- HGV (heavy goods vehicle) access
- Tourist accesses (generally class C roads)
- Other roads (normally unclassified or C roads)

**Safeguarding:** Protecting existing, permitted and allocated sites that have potential for relevant development (waste and minerals) from other incompatible development.

**Scheduled Monuments:** Nationally important monuments and archaeological areas protected under the Ancient Monuments and Archaeological Areas Act.

**Screening:** Screening may take a number of forms, which may include bunds, or planting, or a combination of these and may in some circumstances incorporate a standoff to ensure that the screening is not itself intrusive. The form of screening which would be appropriate, if required, along with the distances and coverage of any screening would be determined following assessment of the detail of potential impacts, as part of any future planning application

**Secondary aggregates:** aggregates obtained as a by-product of other quarrying and mining operations, or aggregates obtained as a by-product of other industrial processes, such as coal fired power station ash, incinerator ash and spent foundry sand.

**Secondary Aquifers:** These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types:

***Secondary A*** - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers;

***Secondary B*** - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

***Secondary Undifferentiated*** - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

**Setting of a heritage asset:** The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

**Specific Sites (for mineral extraction):** where viable resources are known to exist, landowners are supportive of minerals development and the proposal is likely to be acceptable in planning terms. Such sites may also include essential operations associated with mineral extraction. This is the preferred way to plan for the steady and adequate supply of minerals as it provides the necessary certainty on when and where development may take place.

**Site of Specific Scientific Interest (SSSI):** Sites notified and protected under the Wildlife and Countryside Act 1981 on account of their flora, fauna, geological or physiographical features.

**Spatial planning:** Concerned with the physical aspects of places, but not restricted to land use decisions controlled through the planning process. Includes physical aspects about how a place functions and develops.

**Special Areas of Conservation (SAC):** An SSSI of international importance designated under the EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora.

**Special Protection Areas (SPA):** An SSSI of international importance designated under the EC Directive on the Conservation of Wild Birds.

**Statement of Community Involvement:** A document that sets out a local planning authority's intended consultation strategy for different elements of the planning process. This is a requirement of the Planning and Compulsory Purchase Act 2004.

**Strategic Environmental Assessment:** A procedure (set out in the Environmental Assessment of Plans and Programmes Regulations 2004) which requires the formal environmental assessment of certain plans and programmes which are likely to have significant effects on the environment.

**Submission:** A stage of the Local Plan preparation process where the plan is 'submitted' to the Secretary of State for independent examination by a planning inspector.

**Surface water** All lakes, rivers, streams, springs, ponds, impounding reservoirs, wetlands, marshes, water sources, drainage systems on the Earth's surface.

**Sustainability Appraisal:** An evaluation process for assessing the environmental, social, economic and other sustainability effects of plans and programmes. This is a statutory requirement.

**Sustainable development:** Development which meets the needs of the present without compromising the ability of future generations to meet their own needs.

**Thermal treatment:** Can include incineration, gasification and pyrolysis. Techniques used include various moving grate systems and fluidised bed processes.

**Transfer:** The deposition and separation or bulking up of waste before it is removed for recovery or disposal.

**Transport assessment:** This is a process which considers total travel demand; patterns of public transport in the area; how development impacts upon them; and if required how infrastructure or services could be improved to address the impacts (of a development).

**Transport statement:** Where transport issues are such that a full Transport Assessment is not required, a Transport Statement may be acceptable

**Treatment:** Involves the physical, chemical or biological processing of waste to reduce their volume, for segregation to reduce the harmfulness of the waste.

**Unconventional hydrocarbons** Hydrocarbon extraction covers both conventional and unconventional hydrocarbons. Unconventional hydrocarbons refers to oil and gas which comes from sources such as shale or coal seams which act as the reservoirs. Also see conventional hydrocarbons.

**Waste arisings:** The amount of waste generated in any given locality over a given period of time.

**Waste Collection Authority:** A local authority with a statutory responsibility to provide a waste collection service to each household in its area, and on request, to local businesses; in Norfolk the relevant district, borough or city council is the WCA.

**Waste Disposal Authority:** A local authority that is legally responsible for the safe disposal of municipal waste collected by the WCAs and the provision of Household Waste and Recycling Sites; in Norfolk the County Council is the WDA.

**Waste management:** The means of dealing with waste, including waste disposal, transfer, processing, recovery/recycling operations, incineration and other technologies.

**Waste Planning Authority:** An organisation with statutory planning powers relating to waste management development, in most areas the County or Unitary Council.

**Waste transfer:** Waste transfer is the process by which waste is taken from waste producers for treatment, recycling and/or disposal. Then, to minimise the cost of transport and to reduce environmental impacts, transfer stations are used to sort waste and to transfer it to larger vehicles for onward transport. The waste is usually sorted into wastes that can be recycled (such as metal, wood, soil and rubble) and the remaining waste that will be landfilled.

**Wastewater (sewage):** Comprises liquid and solid waste discharged by domestic residences, commercial properties, industry and agricultural activities, which is then carried to Water Recycling Centre via a network of foul sewers.