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Sustainability Appraisal of the Worcestershire Minerals Local Plan

Publication Version

Prepared by LUC
May 2019

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1 Introduction

1.1 LUC was appointed by Worcestershire County Council (hereafter referred to as WCC) in April 2018 to carry out the Sustainability Appraisal (SA) incorporating Strategic Environmental Assessment (SEA) of the emerging Minerals Local Plan (hereafter referred to as the MLP).

1.2 This report relates to the Worcestershire Minerals Local Plan (referred to in this document as "the MLP" or "the Plan") Publication Version MLP document and it should be read in conjunction with that document.

1.3 Once adopted, the plan will replace the current County of Hereford and Worcester Minerals Local Plan which was adopted in 1997. Some policies of the adopted Local Plan were 'saved' by Direction under paragraph 1(3) of Schedule 8 to the Planning and Compulsory Purchase Act 2004.

1.4 The MLP sets out the level of mineral resources required in the county, how and where minerals development will be delivered, and how it will be ensured that mineral resources are not sterilised by other development.

1.5 The MLP is being developed in co-operation with partner organisations and seeks to reflect and complement other plans, including district-level Core Strategies/Local Plans. It directs development to broad areas known as 'strategic corridors' and areas of search within them. It identifies the restoration priorities within the strategic corridors and sets criteria-based policies to allow proposals to be assessed against relevant considerations, enabling a steady supply of minerals, whilst safeguarding Worcestershire's environment and communities.

1.6 A wide range of legislation, policy and guidance informs the MLP. The National Planning Policy Framework (NPPF) states that "*it is essential that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the country needs*" (paragraph 203). The MLP will ensure that sufficient mineral resources are available in the right locations and at the right time to enable this sustainable growth, whilst protecting the environment and quality of life.

1.7 Minerals planning policy in Worcestershire plays a vital role in ensuring there are sufficient minerals for our needs now and in the future. The MLP sets guidelines for the quantity of minerals that should come from Worcestershire until 2035 and beyond. It must also balance the need for minerals and the benefits sites can bring against the likely impact of their development. To do this, the MLP includes policies to make sure that development happens in the right places, in the right way, and with appropriate restoration once mineral operations are complete.

1.8 Once adopted, the MLP will be used by Worcestershire County Council to make decisions about planning applications for mineral extraction and processing in the county. It may also be relevant in the decision-making of the city, borough and district councils in Worcestershire, as well as surrounding authorities.

1.9 The preparation of the MLP is being subject to a full Sustainability Appraisal (SA), in line with the Planning and Compulsory Purchase Act 2004 and current Government planning policy (the NPPF). The preparation of the MLP must also be in accordance with the requirements of European Directive 2001/42/EC (known as the Strategic Environment Assessment, or SEA Directive) as transposed into law in England by the SEA Regulations.

1.10 This Sustainability Appraisal Report has been prepared to provide key stakeholders and members of the public with information on the process and the findings of the Sustainability Appraisal undertaken in preparing the Publication Version MLP. In particular, this report documents the likely significant sustainability effects of implementing the MLP. Earlier iterations of this SA Report accompanied the consultation on the Third Stage Consultation document MLP from December 2016 and the Fourth Stage Consultation document MLP from December 2017.

Outline of the Minerals Local Plan

1.11 It is anticipated that the following minerals requirements will be needed and planned for:

Table 1.1: Anticipated minerals requirements to 2030

Aggregates	
Sand and gravel	11.53 million tonnes
Crushed rock	No target (resource constrained and demand uncertain)
Industrial Minerals	
Silica sand	No target (likely to be worked on a small scale where it occurs alongside aggregate solid sand)
Brick clay	No target (there are already sufficient permissions)
Salt and brine	No target (it is not possible to quantify potential demand)
Building stone	No target (it is not possible to quantify potential demand)
Energy Minerals	
Coal and hydrocarbons	No target (no resources)

1.12 The MLP includes a spatial strategy to guide where minerals development should take place. This is based on working viable resources in areas where there is the greatest ability to achieve green infrastructure restoration priorities. The MLP includes:

- A vision and six objectives for the MLP.
- A key diagram, directing development to strategic corridors.
- Areas of Search for minerals development, showing where extraction is considered appropriate, subject to other policies being met.
- Criteria-based policies to assess the suitability of proposals (both strategic and non-strategic).
- Policy to encourage the use of substitute, secondary and recycled materials and mineral wastes.
- Minerals safeguarding policies to ensure mineral resources are not sterilised by other development.

1.13 The MLP seeks to protect Worcestershire's environment (including habitats, species, landscape, archaeology, historic environment, surface and ground water) and to minimise adverse effects from minerals operations on those nearby (including impacts from noise and dust, vibrations, and visual impacts).

1.14 A suite of background documents sets out the evidence upon which the Minerals Local Plan is based and identifies key matters which the plan must take into account. These are technical documents (resource assessments, methodologies, legislative information, maps, etc.) to help inform the policy direction of the MLP. Their preparation and review is on-going as the plan develops. The suite of documents is available at www.worcestershire.gov.uk/mineralsbackground.

1.15 The Minerals Local Plan has eight chapters, as well as appendices/annexes. These are:

- Introduction
- Portrait of Worcestershire
- Vision and objectives
- Spatial strategy (strategic policies)
- Supply of mineral resources (strategic policies)
- Development management (non-strategic policies)
- Safeguarding mineral resources and supporting infrastructure (strategic policies)
- Implementation and monitoring framework

- Appendix 1: Superseded policies
- Appendix 2: Identifying and defining the strategic corridors
- Appendix 3: Glossary
- Appendix 4: Acronyms

Sustainability Appraisal and Strategic Environmental Assessment

1.16 The purpose of Sustainability Appraisal is to promote sustainable development by integrating sustainability considerations into the preparation and adoption of plans.

1.17 Sustainability Appraisal (SA) is a statutory requirement of the Planning and Compulsory Purchase Act 2004. It is designed to ensure that the Development Plan Document (DPD) preparation process maximises the contribution that a plan makes to sustainable development and minimises any potential adverse impacts. The SA process appraises the likely social, environmental and economic effects of the strategies and policies within a DPD (in this case the MLP) from the outset of its development.

1.18 Strategic Environmental Assessment (SEA) is also a statutory assessment process, required under the SEA Directive, transposed in the UK by the SEA Regulations (Statutory Instrument 2004, No 1633). The SEA Regulations require the formal assessment of plans and programmes which are likely to have significant effects on the environment, and set the framework for future consent of projects. The purpose of SEA, as defined in Article 1 of the SEA Directive is 'to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development'.

1.19 SEA and SA are separate processes but have similar aims and objectives. Simply put, SEA focuses only on the likely environmental effects of a plan whilst SA includes a wider range of considerations, extending to social and economic impacts. The Government's Sustainability Appraisal guidance[12] outlines how it is possible to satisfy both requirements by undertaking a joint SA/SEA process, and to present an SA report that incorporates the requirements of the SEA Regulations.

1.20 **Table 1.2** signposts how the requirements of the SEA Regulations have been met within this SA report.

[1] ODPM (2005) A Practical Guide to the Strategic Environmental Assessment Directive

[2] MHCLG (2015) Planning Practice Guidance (Strategic Environmental Assessment and Sustainability Appraisal). Available at: http://planningguidance.planningportal.gov.uk/

Table 1.2: Requirements of the SEA Regulations and where these have been addressed in this SA Report

SEA Regulations' Requirements	Where covered in this SA report
Environmental Report	
Where an environmental assessment is required by any provision of Part 2 of these Regulations, the responsible authority shall prepare, or secure the preparation of, an environmental report in accordance with paragraphs (2) and (3) of this regulation. The report shall identify, describe and evaluate the likely significant effects on the environment of: (a) implementing the plan or programme; and (b) reasonable alternatives taking into account the objectives and geographical scope of the plan or programme. (Regulation 12(1) and (2) and Schedule 2).	**Chapters 5, 6, 7 and 9** **Appendices 5 to 12**
1) An outline of the contents and main objectives of the plan or programme, and of its relationship with other relevant plans and programmes.	**Chapters 1 and 4** **Appendix 2**
2) The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme.	**Chapter 4** **Appendix 3**
3) The environmental characteristics of areas likely to be significantly affected.	**Chapter 4** **Appendix 3**
4) Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC on the conservation of wild birds and the Habitats Directive.	**Chapter 4** **Appendix 3**
5) The environmental protection, objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental, considerations have been taken into account during its preparation.	**Chapter 4** **Appendix 2**

SEA Regulations' Requirements	Where covered in this SA report
6) The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive effects, and secondary, cumulative and synergistic effects, on issues such as: (a) biodiversity; (b) population; (c) human health; (d) fauna; (e) flora; (f) soil; (g) water; (h) air; (i) climatic factors; (j) material assets; (k) cultural heritage, including architectural and archaeological heritage; (l) landscape; and (m) the interrelationship between the issues referred to in sub-paragraphs (a) to (l).	**Chapters 5, 6, 7 and 9** **Appendices 5 7 to 11**
7) The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme.	**Chapter 9**
8) An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.	**Chapters 2 and 8**
9) A description of the measures envisaged concerning monitoring in accordance with regulation 17.	**Chapter 9**
10) A non-technical summary of the information provided under paragraphs 1 to 9.	A separate non-technical summary document has been produced.
The report shall include such of the information referred to in Schedule 2 to these Regulations as may reasonably be required, taking account of: (a) current knowledge and methods of assessment; (b) the contents and level of detail in the plan or programme; the stage of the plan or programme in the decision-making process; and (c) the extent to which certain matters are more appropriately assessed at different levels in that process in order to avoid duplication of the assessment. (Regulation 12 (3))	Addressed throughout this SA report.
Consultation	
When deciding on the scope and level of detail of the information that must be included in the environmental report, the responsible authority shall consult the consultation bodies. (Regulation 12(5))	An SA Scoping Report was produced in October 2012. This was subject to consultation from 9th October 2012 until 11th January 2013.

SEA Regulations' Requirements	Where covered in this SA report
Every draft plan or programme for which an environmental report has been prepared in accordance with regulation 12 and its accompanying report ("the relevant documents") shall be made available for the purposes of consultation in accordance with the following provisions of this regulation. As soon as reasonable practical after the preparation of the relevant documents, the responsible authority shall: (a) send a copy of those documents to each consultation body; (b) take such steps as it considers appropriate to bring the preparation of the relevant documents to the attention of the persons who, in the authority's opinion, are affected or likely to be affected by, or have an interest in the decisions involved in the assessment and adoption of the plan or programme concerned, required under the Environmental assessment of Plans and Programmes Directive ("the public consultees"); (c) inform the public consultees of the address (which may include a website) at which a copy of the relevant documents may be viewed, and the period within which, opinions must be sent. The period referred to in paragraph (2) (d) must be of such length as will ensure that the consultation bodies and the public consultees are given an effective opportunity to express their opinion on the relevant documents. (Regulation 13 (1), (2), and (3))	This SA Report will be available for consultation alongside the Publication Version MLP document. Earlier versions of the SA were consulted on alongside the following stages of the MLP: • Second Stage Consultation (November 2013) • Third Stage Consultation (December 2016) • Fourth Stage Consultation (November 2018)
Where a responsible authority, other than the Secretary of State, is of the opinion that a plan or programme for which it is the responsible authority is likely to have significant effects on the environment of another Member State, it shall, as soon as reasonable practicable after forming that opinion: (a) notify the Secretary of State of its opinion and of the reasons for it; and (b) supply the Secretary of State with a copy of the plan or programme concerned, and of the accompanying environmental report. (Regulation 14 (1))	The MLP is unlikely to have a significant effect on another EU Member State.
Taking the environmental report and the results of the consultations into account in decision-making (relevant extracts of Regulation 16)	
As soon as reasonably practicable after the adoption of a plan or programme for which an environmental assessment has been carried out under these Regulations, the responsible authority shall: (a) make a copy of the plan or programme and its accompanying environmental report available at its principal office for inspection by the public at all reasonable times and free of charge. (Regulation 16(1))	To be addressed after the MLP is adopted.

SEA Regulations' Requirements	Where covered in this SA report
As soon as reasonably practicable after the adoption of a plan or programme: (a) the responsible authority shall inform (i) the consultation bodies; (ii) the persons who, in relation to the plan or programme, were public consultees for the purposes of regulation 13; and (iii) where the responsible authority is not the Secretary of State, the Secretary of State, that the plan or programme has been adopted, and a statement containing the following particulars: (a) how environmental considerations have been integrated into the plan or programme; (b) how the environmental report has been taken into account; (c) how opinions expressed in response to: (i) the invitation in regulation 13(2)(d); (ii) action taken by the responsible authority in accordance with regulation 13(4), have been taken into account; (d) how the results of any consultations entered into under regulation 14(4) have been taken into account; (e) the reasons for choosing the plan or programme as adopted, in the light of the other reasonable alternatives dealt with; and (f) the measures that are to be taken to monitor the significant environmental effects of the implementation of the plan or programme.	To be addressed after the MLP is adopted.
Monitoring	
The responsible authority shall monitor the significant effects of the implementation of each plan or programme with the purpose of identifying unforeseen adverse effects at an early stage and being able to undertake appropriate remedial action. (Regulation 17(1))	To be addressed after the MLP is adopted.

Related Assessments

Habitats Regulations Assessment

1.22 Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora requires a Habitats Regulations Assessment (HRA) to be undertaken, when necessary, in preparing a project or plan.

1.23 HRA should ensure that as part of the planning process, land use plans protect the integrity of European 'Natura 2000' sites (Special Protection Areas (SPAs), Special Areas of Conservation (SACs), and sites on draft lists for protection). The DCLG guidance, 'Planning for the Protection of European Sites: Appropriate Assessment' (2006) makes clear that HRA and SA are two separate processes, which should be reported on separately.

1.24 A Habitats Regulations Assessment (HRA) has been produced to support the Publication Version MLP[3]. This stated that a HRA Scoping Assessment of the Second Stage Consultation of the MLP was undertaken in 2013. Natural England was consulted on the Scoping Assessment and made a number of specific recommendations that were considered in further iterations of the HRA.

[3] Worcestershire County Council (2019) Worcestershire County Council Minerals Local Plan Habitats Regulation Assessment, Publication Version, Record of Assessment

Natural England agreed with the general breadth, detail and recommendations of the Scoping Assessment and confirmed that the mitigation and best practice approaches set out within the HRA Scoping Assessment were considered to be adequate.

1.25 The HRA Scoping Assessment was updated and re-consulted on to reflect the Third Stage Consultation MLP and then again in October 2018 to reflect the Fourth Stage Consultation MLP. The 2019 HRA of the Publication Version Local Plan supersedes the previous versions and considered whether the Publication Version MLP remains compliant with the Habitats Directive. This concludes that the Worcestershire MLP, as presented in the Publication Version, would not lead to any likely significant effects arising either from the MLP alone, or in combination with other plans or projects on any internationally designated biodiversity sites (also referred to as 'European sites' or 'Natura 2000 sites'). However, the HRA recognises that it is not possible to assess the effects of individual site allocations that would emerge through a subsequent Mineral Site Allocations Development Plan Document (DPD) and that further HRA work would have to be undertaken once the contents of the DPD are known.

Strategic Flood Risk Assessment

1.26 'Amendments to the Surface and Ground Water Protection Issues, including Flood Risk Assessment of Areas of Search, following the Fourth Stage Consultation' (March 2019) has been prepared to support the MLP. This report "outlines the positive and negative effects and focuses on the links between them and mineral, mostly sand and gravel and potential clay working. It identifies the policy issues that need to be developed in the Worcestershire Minerals Local Plan (WMLP) to enable positive effects on the water environment to be maximised and negative effects minimised". It should be noted that the Areas of Search included in the MLP have not changed since the Fourth Stage Consultation MLP.

1.27 It also states that the assessments in the report are based on evidence from the SFRAs completed to date in the county, the Worcestershire Local Flood Risk Management Strategy and Worcestershire Surface Water Management Plan, the Environment Agency Flood Risk Maps, Catchment Based Management in Worcestershire (Technical Background Document) and assessments of the quality and quantity of surface and groundwaters in the county. It clarifies that the Council considers that they are enough to identify the broad issues that need to be considered to inform the Minerals Local Plan.

1.28 The SFRA recognised that negative effects on water quality and quantity could arise due to changes to hydrology as a result of minerals development, such as physical disturbance to aquifers and lowering of groundwater levels, particularly if dewatering is required. Restoration of minerals sites can also affect the quality of ground and surface water, particularly where mineral voids are restored using infilling. Development may contaminate water through spills of hazardous substances, as well as modifying water bodies and building infrastructure on areas at risk of flooding. Minerals development can also lead to beneficial effects on water quality and quantity where it leads to river restoration, habitat creation and flood attenuation or sustainable drainage, particularly through restoration. Restoration schemes can also bring wider benefits, including benefits to health and amenity, tourism, climate change adaptation and remediation of contaminated land.

1.29 The SFRA recognised that whilst most potential sites for minerals extraction lie within flood zones 2 and 3, most of these are identified for sand and gravel extraction, which is considered to be water-compatible development. However, further assessment will be required to determine the potential risk from a combination of flood depth and velocity, in order to determine the appropriate location for stockpiling and associated infrastructure and works. There may also be an increased risk of surface water and overland flow paths as a result of the MLP. The SFRA identified that some building stone and brick clay areas of search lie within flood zone 3b, which is appropriate for sand and gravel workings only. The SFRA concluded that land outside flood risk areas cannot accommodate all necessary minerals development, therefore a Level 2 SFRA may be required and detailed modelling may be required as part of site-specific SFRAs.

Equality Impact Assessment

1.30 An 'Equality Impact Relevance Screening' has been carried out to identify whether a full Equality Impact Assessment (EqIA) is required for the MLP. This screening concluded that EqIA is not required.

Health Impact Assessment

1.31 The HIA for the MLP (July 2018) found that mineral development could have both positive and negative effects leading to changes in health outcomes for the local and wider population. Positive effects identified are related to economic growth, as well as restoration of minerals sites to green spaces. Negative effects relate to the environmental impacts in the construction and operational period and loss of land for healthy food production. The potential for these impacts will vary according to the nature, size, location and duration of the development, and can change over its lifetime.

Aim and structure of the report

1.32 This report is the SA/SEA report for the Publication Version MLP. It has been prepared in the spirit of the integrated approach to SEA and SA, and throughout the report, the abbreviation 'SA' should therefore be taken to refer to 'SA incorporating the requirements of SEA'.

1.33 This chapter provides an introduction to the SA of the MLP. The remainder of this report is structured into the following chapters:

- **Chapter 2** – The Sustainability Appraisal Process So Far, describes the stages of the SA process undertaken to date including how reasonable alternatives have been identified and appraised.
- **Chapter 3** – Methodology, describes the approach used for the specific SA tasks, including how the objectives have been applied to the MLP, and the assumptions used for assessing the potential sustainability effects of the MLP.
- **Chapter 4** – Sustainability Context for Minerals Development in Worcestershire, summarises the MLP's relationship with other relevant plans, policy and strategies, summarises the social, economic and environmental characteristics of Worcestershire, and identifies the key sustainability issues relating to mineral development within Worcestershire.
- **Chapter 5** – Sustainability Appraisal Findings: Context – gives a commentary on any sustainability implications of the introduction and portrait of Worcestershire, as well as assessment results for the vision and objectives.
- **Chapter 6** – Sustainability Appraisal Findings: Spatial Options – sets out the main findings from the SA of the Strategic Corridors and Areas of Search considered for inclusion in the Fourth Stage MLP.
- **Chapter 7** – Sustainability Appraisal Findings: Policies – sets out the main findings from the SA of the policies included in the Fourth Stage Consultation MLP.
- **Chapter 8** – Evolution of the MLP and reasonable alternatives – sets out how the MLP has developed, the reasons for identifying reasonable alternatives, the reasons for selecting those options taken forward and the reasons for not selecting the reasonable alternatives to these.
- **Chapter 9** – Cumulative Effects, Recommendations, Mitigation and Monitoring – considers the effects of the MLP as a whole, makes recommendations for maximising the beneficial effects of the MLP and minimising adverse effects and makes recommendations regarding the approach to monitoring the significant sustainability effects of implementing the MLP.

- **Chapter 10** – Conclusions - summarises the key findings from the SA in terms of any significant sustainability effects predicted (positive or negative) from implementing the MLP and sets out the next steps for the SA.

1.34 The main body of the report is supported by a number of appendices, presented in two volumes:

Volume 1

- **Appendix 1** – Consultation Comments – sets out the comments received at various stages of consultation and explains how these have been addressed.
- **Appendix 2** – Relevant Policies, Plans, Programmes and Sustainability Objectives – provides an update of the review of plans, policies and programmes presented in the Scoping Report.
- **Appendix 3** – Baseline Data – provides an update of the baseline data presented in the Scoping Report.
- **Appendix 4** – How Strategic Corridors and Areas of Search Have Been Appraised – sets out the factors considered in carrying out assessments against each SA objective and how the scoring system presented in Chapter 3 has been applied through the use of assumptions and thresholds.
- **Appendix 5** – Appraisal Matrices for Policies – presents the SA matrices for the policies included in the MLP.
- **Appendix 6** – Evolution of the Minerals Local Plan and reasonable alternatives.

Volume 2

- **Appendix 7** – Appraisal Matrices for Building Stone Area of Search Options – presents the SA matrices for the areas of search for building stone considered for inclusion in the MLP.
- **Appendix 8** – Appraisal Matrices for Brick Clay Area of Search Options – presents the SA matrices for the areas of search for brick clay considered for inclusion in the MLP.
- **Appendix 9** – Appraisal Matrices for Terrace and Glacial Sand and Gravel Area of Search Options – presents the SA matrices for the areas of search for terrace and glacial sand and gravel considered for inclusion in the MLP.
- **Appendix 10** – Appraisal Matrices for Solid Sand and Gravel Area of Search Options – presents the SA matrices for the areas of search for solid sand and gravel considered for inclusion in the MLP.
- **Appendix 11** – Appraisal Matrices for Silica Sand Area of Search Options – presents the SA matrices for the areas of search for silica sand considered for inclusion in the MLP.
- **Appendix 12 –** Summary findings from previous stages of Sustainability Appraisal.

2 The Sustainability Appraisal Process So Far

2.1 In addition to complying with legal requirements, the approach being taken to the SA of the MLP is based on current best practice and the guidance on SA/SEA set out in the national Planning Practice Guidance (PPG), which involves carrying out SA as an integral part of the plan-making process. **Table 2.1** below sets out the main stages of the plan-making process and shows how these correspond to the SA process.

Table 2.1: Corresponding stages in plan making and SA

Local Plan Step 1: Evidence Gathering and engagement
SA stages and tasks
Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope 1: Identifying other relevant policies, plans and programmes, and sustainability objectives 2: Collecting baseline information 3: Identifying sustainability issues and problems 4: Developing the SA framework 5: Consulting on the scope of the SA
Local Plan Step 2: Production
SA stages and tasks
Stage B: Developing and refining options and assessing effects 1: Testing the Plan objectives against the SA Framework 2: Developing the Plan options 3: Evaluating the effects of the Plan 4: Considering ways of mitigating adverse effects and maximising beneficial effects 5: Proposing measures to monitor the significant effects of implementing the Plans
Stage C: Preparing the Sustainability Appraisal Report 1: Preparing the SA Report
Stage D: Seek representations on the Plan and the Sustainability Appraisal Report 1: Public participation on Plan and the SA Report 2(i): Appraising significant changes
Local Plan Step 3: Examination
SA stages and tasks

2(ii): Appraising significant changes resulting from the Examination
Local Plan Step 4 & 5: Adoption and Monitoring
SA stages and tasks
3: Making decisions and providing information
Stage E: Monitoring the significant effects of implementing the Plan 1: Finalising aims and methods for monitoring 2: Responding to adverse effects

2.2 The following sections describe the approach that has been taken to the SA of the MLP to date and provide information on the subsequent stages of the process.

Stage A: The SA Scoping Report

2.3 The SA process began with a Scoping Report, produced at the earliest evidence-gathering stage of MLP plan-making. The Scoping Report established the sustainability issues of importance for Worcestershire upon which the MLP could have an influence. These issues helped to define specific objectives to use when appraising the performance of the draft plan. Sustainability appraisal guidance advocates a balance of environmental, social and economic objectives. Within this context, the selection of objectives derived from a combination of the following considerations, all of which were based on the best information available at the time:

- Review of the issues of relevance to Worcestershire as described within plans, policies and programmes;
- Review of sustainability characteristics and issues; and
- Analysis of baseline data

2.4 Plans, policies, and programmes at the European, national, regional and local level were considered, although it was assumed that national and European plans had been incorporated into the content and strategic direction of regional and locally-based documents. Only European and national documents of greatest relevance to the emerging plan and to sustainability were reviewed. The purpose of the review was not to highlight every detail from every document, but to identify the key implications for the SA. The date of publication/period of validity, key objectives/targets, and potential implications for the Minerals Local Plan were recorded for each document reviewed. As the review is a dynamic process, revisions have been made as new documents have emerged or have been revised, and as new plans are adopted. An updated version of the review of relevant policies, plans and programmes is included in **Appendix 2.**

2.5 The key points emerging from this review were then expanded upon through a consideration of baseline data. Baseline data plays a fundamental role throughout the appraisal, providing the evidence base from which to predict and monitor the effects of the MLP. In particular, the SEA Directive requires that "the relevant aspects of the current state of the environment and likely evolution thereof without implementation of the plan" be considered. An updated review of the baseline is included in **Appendix 3**. The Directive also requires a summary of "any existing environmental problems", especially those relating to European sites. Key environmental and sustainability issues are set out in **Chapter 4**. This SA has also considered the results of the HRA, as explained in **paragraph1.22-1.25**.

2.6 These issues, together with those identified through the review of plans, policies and programmes (and any other issues which emerged through complementary research) informed the 'SA framework' presented in the Scoping Report.

2.7 The SA Framework is at the heart of the Sustainability Appraisal process. Through the development of a set of objectives and decision-making criteria, the framework provides the means through which sustainability effects of the emerging plan can be described, analysed and compared. The SA objectives are critical in assessing the potential sustainability effects of the plan and in prompting consideration of alternative approaches.

2.8 The approach proposed in the Scoping Report was consulted on alongside the First Stage Consultation on the MLP from October 2012 to January 2013. The draft Scoping Report was also made available on Worcestershire County Council's website as part of a suite of consultation documents. Responses to the draft Scoping Report were received from each of the statutory agencies (English Heritage [now Historic England], the Environment Agency, and Natural England). No responses to the draft Scoping Report were received from developers, the public, or any other party. The statutory agencies provided constructive feedback on how the proposed approach could better reflect sustainability issues. This included signposting to additional plans, policies and programmes which should be reviewed, and suggesting amendments and additions to the proposed SA framework to allow a more nuanced consideration of particular issues.

2.9 **Appendix 1** summarises those comments made during the consultation that suggested changes to the SA Scoping Report.

2.10 The SA Scoping Report is available on the MLP background documents web page here: http://www.worcestershire.gov.uk/background

Developing the SA Framework

2.11 The SEA Regulations, Schedule 2(6) require the Environmental Report to consider:

"The likely significant effects on the environment, including short, medium and long term effects, permanent and temporary effects, positive and negative effects and secondary, cumulative and synergistic effects, on issues such as (a) biodiversity, (b) population, (c) human health, (d) fauna, (e) flora, (f) soil, (g) water, (h) air, (i) climatic factors, (j) material assets, (k) cultural heritage including architectural and archaeological heritage, (l) landscape and (m) the inter-relationship between the issues referred to in sub-paragraphs (a)–(l)."

2.12 Development of an SA Framework is not a requirement of the SEA Regulations. However, it provides a recognised way in which the likely sustainability effects of a plan can be predicted, described, analysed and compared in a consistent way. Once SA Objectives are developed they provide the basis for testing options and policy formulation of relevant aspects of the MLP. The objectives derived from this process are the basis for identifying appropriate indicators and targets against which the success of adopted strategies and policies may be judged.

2.13 The objectives reflect the review of relevant plans and programmes (as set out in **Appendix 2**) and baseline situation/key issues described in **Chapter 4** and **Appendix 3**.

2.14 Following amendments made as a result of consultation feedback, the Scoping Report established the SA framework in 2013. Further minor amendments have been made as the SA process has developed, and there have been opportunities for comment on the SA during all stages of MLP consultation.

2.15 Several changes were made to the SA framework between the 'Initial SA Report' accompanying the MLP Second Stage Consultation and the SA Report accompanying the Third Stage Consultation. These changes were intended to simplify the process and avoid repetition and irrelevant content. The changes were:

- The SA objective on 'Landscape' as set out in the Scoping Report referred only to "landscape character and quality", but a modification was made to the SA objective so that visual impact was also recognised.

- The term 'biodiversity' includes all species of animals and plants. As such, the 'Biodiversity and geodiversity' SA objective was amended to remove the former reference to "flora and fauna", which was superfluous.

- The SA objective on 'Natural resources' was changed from "Protect and enhance water, soil and air quality" to "Protect and enhance water and air quality". This is because soil quality was already considered under the 'Material assets' objective, and to include it twice could lead to duplication or, at worst, contradictions in the appraisal.

- There was duplication between the 'Climate change' and 'Energy' objectives. These two objectives were therefore combined into a single overall 'Climate change and energy' objective.

- The 'Health' objective was revised to become 'Health and amenity', as many issues, such as increases in noise or visual intrusion, may not have a measureable impact on physical or mental health but can still affect a person's quality of life. As such, they are valid social/environmental considerations within the SA.

2.16 The policy and spatial options considered for inclusion in the MLP have been appraised against the SA Objectives, which are included in **Table 2.2** below. **Table 2.2** also demonstrates how the SA objectives address the topics required in the SEA Regulations[4].

Table 2.2: Sustainability Appraisal Framework for the MLP

Reference	Objective	SEA Topics
1: Landscape	Safeguard and strengthen landscape character and quality and minimise negative visual impact	Landscape
2: Biodiversity and geodiversity	Conserve and enhance Worcestershire's biodiversity and geodiversity.	Biodiversity, flora, fauna
3: Cultural heritage, architecture and archaeology	Preserve and enhance the historic environment and deliver well-designed and resource-efficient development which respects local character and distinctiveness.	Cultural heritage, including architectural and archaeological heritage
4: Material assets	Ensure efficient use of land through safeguarding of mineral reserves, the best and most versatile agricultural lands, land of Green Belt value, maximising use of previously-developed land and reuse of vacant buildings, whilst safeguarding open space/green infrastructure.	Material assets, soil
5: Natural resources	Protect and enhance water and air quality.	Water, air
6: Climate change and energy	Reduce causes of and adapt to the impacts of climate change. Promote energy efficiency and energy generated from renewable energy and low-carbon sources.	Climatic factors
7: Flooding	Ensure inappropriate development does not occur in high-risk flood-prone areas and does not adversely contribute to fluvial flood risks or contribute to surface water flooding in all other areas.	Water, climatic factors

[4] Biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage and landscape

Reference	Objective	SEA Topics
8: Access to services	Improve the quality of, and equitable access to, local services and facilities, regardless of age, gender, ethnicity, disability, socio-economic status or educational attainment.	Material assets, population
9: Health and amenity	Improve the health and well-being of the population and reduce inequalities in health.	Human health
10: Waste	Manage waste in accordance with the waste hierarchy: 1) reduce, 2) reuse, 3) recycling and composting, 4) recovery, 5) disposal.	Material assets
11: Traffic and transport	Reduce the need to travel and move towards more sustainable travel patterns.	Material assets
12: Growth with prosperity for all	Develop a knowledge-driven economy, the infrastructure and skills base whilst ensuring all share the benefits, urban and rural.	Material assets, population
13: Provision of housing	Provide decent affordable housing for all, of the right quality and tenure and for local needs, in clean, safe and pleasant local environments.	Material assets, population
14: Participation by all	Provide opportunities for communities to participate in and contribute to decisions that affect their neighbourhood and quality of life, encouraging pride and social responsibility in the local community.	Population
15: Technology, innovation and inward investment	Promote and support the development of new technologies, of high value and low impact, especially resource efficient technologies and environmental technology initiatives.	Material assets
16: Population (skills and education)	Raise the skills levels and qualifications of the workforce.	Population
17: Population (crime & fear of crime)	Reduce crime, fear of crime and antisocial behaviour.	Population

Stage B: Developing and Refining Options and Assessing Effects

2.17 Developing options for a plan is an iterative process undertaken by the local planning authority usually involving a number of consultations with public and stakeholders. Consultation responses and the SA can help to identify where there may be other 'reasonable alternatives' to the options being considered for a plan (e.g. additional sites that may be suitable for development). The SA can also help decision makers by identifying the potential positive and negative sustainability effects of each option.

2.18 Regulation 12 (2) of the SEA Regulations requires that:

"The (environmental or SA) report must identify, describe and evaluate the likely significant effects on the environment of —

(a) implementing the plan or programme; and

(b) reasonable alternatives, taking into account the objectives and the geographical scope of the plan or programme"

2.19 It should be noted that any alternatives considered to the plan need to be "reasonable". This implies that alternatives that are "not reasonable" do not need to be subject to appraisal.

Examples include alternatives that do not meet the objectives of the plan or national policy (e.g. the NPPF), or are not within the geographical scope of the plan.

2.20 It also needs to be recognised that the SEA and SA findings are not the only factors taken into account when determining a preferred option to take forward in a plan. There will often be an equal number of positive or negative effects identified for each option, such that it is not possible to 'rank' them based on sustainability performance in order to select a preferred option. Factors such as consultation responses, other Council targets and conformity with other plans, programmes and strategies will also be taken into account by plan-makers when selecting preferred options for their plan.

2.21 Alternatives considered in the preparation of the MLP to date are discussed further in **Chapter 8**.

Stage C: Preparing the Sustainability Appraisal report

2.22 This SA Report describes the process undertaken to date in carrying out the SA of the MLP. It sets out the findings of the appraisal, highlighting any likely significant effects (both positive and negative, and taking into account the likely secondary, cumulative, synergistic, short, medium and long-term and permanent and temporary effects), making recommendations for improvements and clarifications that may help to mitigate negative effects and maximise the benefits of the plan, and outlining proposed monitoring measures.

Stage D: Consultation on the MLP and this SA Report

2.23 This SA Report is being published for comment alongside the Publication Version MLP from 19th August 2019 to 30th September 2019. For more information on the consultation and details of how to respond, please visit the MLP webpages at www.worcestershire.gov.uk/minerals or contact the minerals planning team on minerals@worcestershire.gov.uk or 01905 766374.

Stage E: Monitoring Implementation of the Plan

2.24 Stage E will follow adoption of the MLP. The SEA Regulations and the Government's SA Guidance require that the Sustainability Report includes a description of measures envisaged concerning monitoring. This is discussed in **Chapter 9**.

3 Methodology

Timetable

3.1 The SA process is scheduled to co-ordinate with the production of the emerging plan. This is to ensure that the SA plays a valid role, and to ensure there are opportunities for its findings to influence the plan. Any recommendations identified in the SA are provided to the plan-makers in advance of the final consultation version being published to ensure that there is opportunity for the MLP to reflect them and contribute to the aims of sustainable development.

3.2 This SA Report has been produced to accompany the Publication Version Minerals Local Plan. This version of the MLP sets out a proposed approach for how and where minerals should be worked and how the greatest restoration benefits can be realised. The MLP is being consulted upon alongside this SA Report.

How the objectives have been applied to the MLP

3.3 The SA framework sets the approach that has been used to test the sustainability of the MLP in this Environmental Report. The framework includes objectives covering the MLP's social, environmental and economic effects. The approach proposed in the MLP has been appraised to determine how far it satisfies each objective, and this process highlights particular problems and opportunities for each specific issue, to build a picture of the overall sustainability of the MLP.

3.4 This SA has sought to test all the main components of the MLP - including the policies, strategic corridors and areas of search - but has not considered the more 'contextual' sections (such as the Portrait of Worcestershire) in detail. Where appropriate, this SA provides observations or recommendations on the contextual sections of the Plan, but they have not been scrutinised to the same degree as the more substantive elements.

3.5 Due to the breadth of issues included within the SA, the emerging plan will only have limited scope to influence some of the objectives.

3.6 Where appropriate, matrices have been used to provide a transparent appraisal of the performance of each element of the MLP against the objectives.

3.7 The following sections highlight some of the important relationships between minerals development and the SA objectives.

SA Objective 1: Landscape

3.8 The SA objective on landscape is to "Safeguard and strengthen landscape character and quality and minimise negative visual impact".

3.9 The likely effects on the landscape from minerals development will depend on the scale and nature of the development and how it relates to the landscape and receptors during and after operations. Landscape character is strategic in scale and may, depending on scale and circumstance, be unaffected by localised, one-off, site-specific changes. Indeed, WCC states that "Character assessment is … in the first instant, a strategic decision support tool and becomes less relevant as the scale of the area in question declines". More localised visual impact can, however, be significant, depending on the impact(s) and receptor(s).

3.10 The nature of minerals extraction means that the topography within and around sites will almost certainly change during operational periods and once sites are restored. As part of planning applications for mineral sites, applicants should provide sufficient information for the planning

authority to understand the likely landscape and visual impacts of a scheme during working and restoration periods. A Landscape and Visual Impact Assessment (LVIA) should provide an assessment of likely significant landscape effects. WCC states[5] that an LVIA will be required for "all development proposals that, due to their scale or location, are likely to have significant visual impacts. A Landscape and Visual Impact Assessment will also likely be required for proposals within or visible from an Area of Outstanding Natural Beauty". In the case of quarrying proposals, the requirement for Environmental Impact Assessment[6] will lead to the submission of an LVIA as part of the Environmental Statement accompanying a planning application[7].

3.11 Mitigation of negative effects may be possible, to either reduce the effect altogether, or else to ameliorate it to an acceptable degree. SA recommendations can include limiting workings or certain types of operation to specific areas within a wider site boundary, or requirements for screening. It is important, however, that any screening to mitigate landscape and visual impact does not itself compromise this SA objective; earth bunds and tree belts can become permanent additions to the landscape and, while this may be appropriate in some circumstances, it may not be in others. The SA would therefore recommend, where appropriate, a commitment to management of trees, and possibly removal of bunds as part of restoration.

SA Objective 2: Biodiversity and Geodiversity

3.12 This objective is to "Conserve and enhance Worcestershire's biodiversity and geodiversity".

Biodiversity

3.13 Minerals sites can have profound effects on biodiversity, as they can involve large-scale alteration of habitats over long periods. In the short term, during development and operations, effects on biodiversity may be negative, unless compensatory habitat is provided to mitigate loss. In the longer term, as sites are restored (either in phases, or all at once), there may be opportunities to not only reinstate lost habitats, but to secure net gains for biodiversity. The exact impact will depend on the nature of the minerals site and the presence of receptors.

3.14 Mitigation may be required for some operations, which can include avoiding workings during certain times of the year, and the provision of compensatory habitat.

Geodiversity

3.15 Geodiversity is "the variety of rocks, fossils, minerals, natural processes, landforms and soils that underlie and determine the character of our landscape and environment"[8].

3.16 Minerals development can present challenges and opportunities for geodiversity. Extraction can reveal geology that may not otherwise be exposed, offering new opportunities for education, but can also destroy valuable geodiversity resources.

3.17 Recommended mitigation measures may include the retention of exposed geology for future educational or tourism benefit, or the avoidance of operational activities in the vicinity of known geodiversity assets.

SA Objective 3: Cultural heritage, architecture and archaeology

3.18 This SA objective is to "Preserve and enhance the historic environment and deliver well-designed and resource-efficient development which respects local character and distinctiveness".

3.19 As with geodiversity, Worcestershire's cultural heritage, architecture and archaeology could be compromised and/or enhanced by minerals development, depending on the circumstances. The

[5] Worcestershire County Council (2018) Planning Validation Document: Update February 2018

[6] Quarries are listed among other extractive industries in Schedule 2 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011.

[7] Schedule 4 of the EIA Regulations lists landscape as one of the aspects of the environment which must be considered in the Environmental Statement, and the Landscape Institute states, in its 'Guidelines for landscape and visual impact assessment, third edition consultation draft', section 1.6, that "as a core part of the EIA process LVIA is also formally required".

[8] UK Geodiversity Action Plan definition.

historic environment is a finite resource, and minerals development has the potential to physically damage or destroy it, if operations occur in an inappropriate location or are carried out in an inappropriate manner. The importance of setting to the historic environment also needs to be taken into account, as it may be that minerals development could fundamentally alter the characteristics that contribute to the special character of an historic environment asset.

3.20 The most obvious interaction between minerals and the historic environment is in aggregates extraction along rivers. Because much of Worcestershire's sand and gravel resource lies along river corridors, it often coincides with evidence of previous habitation. A report of a 2007 project, Archaeology and Aggregates in Worcestershire: a resource assessment and research agenda[9] notes that the Avon Valley and Carrant Brook corridors "have been prime foci of archaeological fieldwork and research since the 1970s, due to a constant demand for sand and gravel and the near-ubiquitous presence of archaeological remains". It can be inferred that this ubiquity will be found elsewhere alongside the county's other rivers and tributaries, as "The archaeological resource of the Stour is less well known while that of the Teme is poorly understood, due in part to the absence of development-led fieldwork including that driven by sand and gravel extraction". This highlights the benefits that minerals extraction can bring in furthering our understanding of the historic environment; without minerals extraction, many archaeological sites and finds may never be discovered and recorded. The report notes that the nature of archaeological remains in such circumstances - buried under thick alluvial layers - often means that conventional non-invasive techniques used to help their identification, such as geophysics, fieldwalking and cropmark analysis, are often rendered ineffective. As such, minerals workings may provide the only realistic opportunity to identify important archaeological remains.

3.21 Mitigation of negative effects may be possible, and best practice approaches are well-established in the industry. The MLP's overall approach to GI-led restoration, while not focussing specifically on the historic environment, can nevertheless make a valuable contribution. Distinctive, well-preserved landscapes are often commensurate with preserved historic assets and biodiversity opportunities.

3.22 Where some degree of risk to the historic environment is identified, it does not usually mean that minerals development cannot go ahead. The 2007 project notes that "A range of mitigation strategies or outcomes may be recommended by the Archaeological Planning Officer. In rare instances no archaeological constraints will be placed upon the application. Similarly rarely, it is possible that it will be recommended that planning permission be refused on archaeological grounds. More commonly it might be recommended that an area of significant deposits is taken out of the application area or most commonly some form of mitigation strategy to record archaeological deposits prior to extraction will be recommended. The proper fulfilment of the recommended mitigation strategy will then form a planning condition placed upon the application"[10].

SA Objective 4: Material assets

3.23 This SA objective is to "Ensure efficient use of land through safeguarding of mineral reserves, the best and most versatile agricultural lands, Green Belt land, maximising use of previously-developed land and reuse of vacant buildings, whilst safeguarding open space/green infrastructure".

3.24 The geology that underpins mineral resources also plays a major role in determining the location of 'best and most versatile' agricultural land. As such, many mineral resources will be located beneath high-quality, productive farmland. Even where the land is not of the highest quality, it can still make a contribution to agricultural production, and its loss to minerals development needs to be carefully considered. During minerals operations, at least part of a site will be

[9] Worcestershire County Council and Cotswold Archaeology (November 2007) Archaeology and Aggregates in Worcestershire: a resource assessment and research agenda.

[10] Worcestershire County Council and Cotswold Archaeology (November 2007) Archaeology and Aggregates in Worcestershire: a resource assessment and research agenda, Mitigation Strategies.

unavailable for agriculture at any one time, and it is not until site restoration that full agricultural use may return. Because the minerals under the surface help to determine the land above, merely backfilling an area of mineral extraction with a different material to re-build the landform may not return the land to pre-development quality. Much will depend on the material used to fill the void and the final surface, and the agreed approach to restoration. As is seen later in this SA, a GI-led approach to restoration can have both positive and negative effects on agriculture. If a site is planned to be restored to farmland through a comprehensive plan, this could have beneficial effects. If, however, the land has been identified for, say, recreation provision, this could prevent the land from returning to agriculture and lead to a net loss in available productive capacity.

3.25 The relationship of minerals extraction to the Green Belt is different to many other types of development. Because minerals can only be extracted where they are found, national policy states that "mineral extraction" and certain other forms of development are "not inappropriate in the Green Belt provided they preserve its openness and do not conflict with the purposes of including land within it"[11]. It is too simplistic to suggest that the Green Belt has no bearing on minerals development, as some parts of a minerals development may not constitute "mineral extraction", and all parts may or may not be inappropriate depending on the specific circumstances.

3.26 That element of the SA objective that is concerned with safeguarding mineral reserves does have relevance to the MLP, as the volume and location of extracted materials should ideally, from a sustainability perspective, closely match the level and location of need, subject to minerals being of the right quality and accessibility. If the plan overall, or areas of search proposed the delivery of 'excessive' quantities of minerals relative to need, this could give rise to unsustainable transport movements, as material is exported to markets outside the county.

3.27 Mitigation measures for this objective may include avoiding the Green Belt if development would compromise its purposes, and avoiding best and most versatile agricultural land if this could not be restored to equivalent quality post-extraction. Mitigation could also include ensuring that agriculture forms part of the development management policies and GI-led restoration proposals across the plan and for strategic corridors and areas of search.

SA Objective 5: Natural resources

3.28 This SA objective is to "Protect and enhance water and air quality".

Water quality

3.29 Minerals extraction can affect water quality in a number of ways, including through run-off and discharges from extraction and processing operations. Excavation can alter the water table and could potentially, if not carefully controlled, affect aquifers. The locations of many aggregates sites means there is often little distance between mineral workings and rivers, which could risk any harmful run-off making its way to a river. Minerals development can also have positive effects on water quality, especially through GI-led restoration proposals, by working with natural processes to filter pollutants.

3.30 Mitigation of potential negative effects on water quality could include avoiding development within certain locations, and adopting stringent policies to ensure that full account is taken of the need to protect and enhance water quality at application stage.

Air quality

3.31 Minerals development has the potential to negatively affect air quality through the emission of dust and from plant and vehicle fumes. It could also potentially remove trees and vegetation that act as air pollution filters, in order to facilitate development.

[11] MHCLG (2019) National Planning Policy Framework, paragraph 146.

3.32 This SA objective also raises issues that are considered under the 'Health and amenity' objective, as dust and fumes can negatively affect people's health and amenity.

3.33 Mitigation of negative effects on air quality could be achieved through reducing the extent or operating times of mineral development, and ensuring that HGVs do not use inappropriate roads and avoid AQMAs where possible. Specific site management practices such as wheel washing and netting of HGVs has been proven to reduce the generation of dust, and all such measures should be fully considered and conditioned at planning application stage, where appropriate.

SA Objective 6: Climate change and energy

3.34 This SA objective is to "Reduce causes of and adapt to the impacts of climate change. Promote energy efficiency and energy generated from renewable energy and low-carbon sources".

3.35 A research report on the climate change impacts on minerals extraction and other industries[12] found that "Improving extraction methods and increasing recycling rates can address the depletion of certain materials, including those used in mitigation technologies". The MLP has a key role to play in not only facilitating the extraction of minerals, but also in preventing any more extraction than is necessary to meet identified requirements. This means that the MLP should seek to maximise the use of secondary and recycled materials, which not only prevents needless depletion of Worcestershire's resources, but also avoids many of the climate change impacts that can arise through extraction and processing (although secondary resources can also require significant energy and other inputs that can also exacerbate climate change). The report also highlights the issue – often overlooked – of the need for sufficient materials to be produced to enable a shift to a low-carbon economy, and to build the physical infrastructure needed to tackle climate change. It is not the MLP's role to dictate how materials should be used, and some may well be used for purposes that contribute to climate change; but many will also be needed to help us to mitigate and adapt to climate change. This also links to the SA objective on technology, innovation, and inward investment.

3.36 The negative effects of mineral extraction on climate change tend to arise as result of using energy-intensive equipment and transport, as well as the release of stored carbon from soil disturbance, and the loss of trees and plants as part of development. The spatial element of the MLP can help to reduce these effects by guiding minerals development to locations that minimise transport movements. The development management policies can seek to ensure that working methods reduce carbon emissions. The restoration elements can recognise the role that GI-led restoration can play in mitigating and adapting to climate change. Former mineral sites can often make a valuable contribution to reducing carbon through effective planting, and can also provide resources to help adapt to climate change, including recreational assets, green spaces and waterbodies to allow people to escape urban heat islands and to allow biodiversity to move and connect. The potential for former mineral sites to increase flood storage is also an important aspect of climate change adaptation, but this is covered under the SA objective on flooding.

3.37 Further mitigation can be achieved by mineral sites reducing their need for energy through exploiting lower-carbon production methods, and by sourcing more of the site and transport energy requirements from renewable sources.

SA Objective 7: Flooding

3.38 This SA objective is to "Ensure inappropriate development does not occur in high-risk flood-prone areas and does not adversely contribute to fluvial flood risks or contribute to surface water flooding in all other areas".

3.39 Sand and gravel working is defined as "water-compatible" in national policy, and the location of such a development within a flood zone would be unlikely to be a valid reason for refusing

[12] University of Cambridge Institute for Sustainability Leadership/BSR (June 2014) Climate Change: Implications for Extractive and Primary Industries Key Findings from the Intergovernmental Panel on Climate Change Fifth Assessment Report

planning permission. Not all aspects of a minerals site may be compatible, however, and key infrastructure should not be put at risk. Minerals working and processing (except for sand and gravel working) is defined as "less vulnerable". Flood zones can play a valuable role in flood storage and slowing floodwater, and the MLP has a role to play in ensuring that any minerals sites that come forward in such areas consider how they might be able to maintain and improve flood storage capacity during and after extraction. A site that floods may require the pumping of water to remain operational, which could require the extensive use of diesel and electric plant, with resultant carbon emissions.

3.40 The MLP should be informed by the results of Strategic Flood Risk Assessments which consider these issues in greater detail.

3.41 Where minerals extraction is considered water compatible, negligible effects are recorded, as minerals development and associated infrastructure may still have some, minimal, impact on flood risk.

3.42 Mitigation measures for flooding may include maximising opportunities to increase flood storage as part of site restoration, and ensuring that non flood-compatible development avoids potential flood risk both now and in the future under climate change projections.

SA Objective 8: Access to services

3.43 This SA objective is to "Improve the quality of, and equitable access to, local services and facilities, regardless of age, gender, ethnicity, disability, socio-economic status or educational attainment".

3.44 Although this SA objective is potentially wide-ranging, the SA has focussed primarily on access in terms of rights of way. The other issues are reflected where relevant, and some are also discussed in relation to other SA objectives. Minerals development can compromise access by blocking off routes either temporarily or permanently, due to the size of operations and the need to ensure public safety. Conversely, minerals sites can also provide opportunities to improve access as part of restoration proposals, for example by creating linked green infrastructure resources where previously there were none, or by improving the quality and/or quantity of routes in the immediate area.

3.45 As stated in the MLP's Portrait of Worcestershire, at paragraph 2.147, "Minerals development may temporarily prevent or alter access to green spaces, public rights of way or other access routes, but there is also significant potential for mineral workings to contribute to the provision of accessible green space and to improved public rights of way networks". The MLP, in setting policies for site development and restoration, can help to ensure that access is given full consideration by applicants when drawing up applications, and that decision-makers have sufficiently robust policies to prevent negative effects on access routes.

SA Objective 9: Health and amenity

3.46 This SA objective is to "Improve the health and well-being of the population and reduce inequalities in health".

3.47 Minerals sites can potentially affect health and amenity in a number of ways. The nature of minerals development means that a variety of emissions are likely to arise, from noise, dust, light pollution, etc. These can occur as a result of activities on site and also from vehicle movements. While some of these may not amount to threats to health, they can nevertheless affect people's amenity. HGV movements along unsuitable roads could potentially have a health and safety implication.

3.48 As with any built development, minerals sites must take into account the nature of their surroundings, including any areas that need to be protected to avoid safety risks. Minerals sites, especially during and after restoration, can lead to the creation of water bodies that attract birds, potentially creating a risk of bird strike to aircraft. Consideration should be given to the potential for impacts on those airports/airfields within 13km of a minerals site.

3.49 Mitigation measures for health and amenity may include limiting the size or operating hours of sites, and requiring vehicles to avoid potentially unsafe routes, such as narrow lanes with limited visibility. Specific on-site measures to mitigate negative effects may include noise bunds and dust suppression technology. The restoration approach guided by the MLP can also allow minerals development to make a positive contribution to health and amenity by providing green infrastructure.

SA Objective 10: Waste

3.50 This SA objective is to "Manage waste in accordance with the waste hierarchy: 1) reduce, 2) reuse, 3) recycling and composting, 4) recovery, 5) disposal".

3.51 The British Geological Survey (et al)[13] found that for the UK's estimated annual production of 82.4 million tonnes of sand and gravel, 9.2 million tonnes of quarry waste and 20.6 million tonnes of quarry fines were generated. The MLP has a role to play in seeking to reduce waste generation. Avoiding the need for extraction can help to reduce associated waste. Making better use of existing resources (some of which may themselves be considered 'waste') as alternatives to new extraction can not only preserve Worcestershire's limited minerals resources, but can also help to avoid the negative effects associated with primary minerals development, including waste generation and carbon emissions. This SA objective therefore has close links to the objective on climate change.

3.52 The overburden covering mineral resources may itself be waste, but restoration proposals can often offer the opportunity for such wastes to contribute to backfill and the shaping of the final landform.

3.53 The spatial distribution of minerals sites has the potential to affect waste management. If a minerals site were to be developed too close to a waste site, it could limit operating and/or future expansion of the waste site. Additionally, development of minerals and waste sites in close proximity could have cumulative negative effects on traffic, air pollution and amenity. To ensure that Worcestershire has sufficient capacity to manage its waste now and in the future, certain waste sites are safeguarded, to ensure that inappropriate development does not compromise their ability to play a part in the waste hierarchy. This safeguarding is provided by the Waste Core Strategy, but the SA should nevertheless seek to identify any potential effects from minerals development on existing or potential future waste sites.

SA Objective 11: Traffic and transport

3.54 This SA objective is to "Reduce the need to travel and move towards more sustainable travel patterns".

3.55 While the number of trips generated by employees and visitors to minerals sites may be relatively small, the movement of extracted material will require significant trips by heavy goods vehicles, if alternative transportation is unavailable or unviable. The nature of river terrace sand and gravel resources means that many sites are close to waterways, but whether or not water-borne transport is available will depend on a range of factors. Access to the waterway, volume of material being moved, and the location of navigable and non-navigable stretches of water will all influence the use of water-borne transport. The MLP's Portrait of Worcestershire states that "There are currently no handling and processing facilities for the bulk transport of minerals by rail or inland waterway in Worcestershire".

3.56 If alternative transport modes are unlikely, the most sustainable option for minerals sites may therefore be to make best use of the strategic highway network. Sites that are accessible to motorways and main roads can avoid the need for lengthy journeys along unsuitable roads to reach markets. This can also help to avoid health and amenity impacts, by reducing the number of HGVs passing housing and other sensitive receptors. Sites that are so remote that they are

[13] Goodquarry.com (British Geological Survey, et al). (2007) Quarry Fines and Waste

very distant from intended markets are unlikely to come forward in Worcestershire, and the transport aim should be to ensure as small a distance as possible.

3.57 The MLP can help to mitigate the negative effects of transport by encouraging greater use of alternative methods both on and off site, including conveyors and pipelines. These alternatives will need to be considered carefully to ensure they represent a better alternative to conventional diesel vehicles.

SA Objective 12: Growth with prosperity for all

3.58 This SA objective is to "Develop a knowledge-driven economy, the infrastructure and skills base whilst ensuring all share the benefits, urban and rural".

3.59 Minerals are crucial to growth and infrastructure. Minerals development allows the economic value of Worcestershire's natural resources to be maximised. The minerals industry can support local employment, including in rural areas where other employment opportunities may be limited. Development also allows other construction to take place; without a sufficient supply of the right minerals, the buildings, roads, flood defences and other infrastructure needed to support the local economy could not be built. Even if certain minerals are worth relatively little, they can still make an important contribution to facilitating development.

3.60 Negative effects from minerals development on growth and infrastructure are also possible if the location of minerals sites prevents or hinders other types of economic development.

SA Objective 13: Provision of housing

3.61 This SA objective is to "Provide decent affordable housing for all, of the right quality and tenure and for local needs, in clean, safe and pleasant local environments".

3.62 There is a direct relationship between the provision of minerals and the delivery of housing. As more sustainable construction methods become better established, it may be that housing relies less and less on traditional 'bricks and mortar', and so the importance of minerals sites to the county's housing provision may reduce. Nevertheless, it is difficult to imagine that Worcestershire's mineral resources will not remain an important component of delivering housing throughout the plan period and beyond. Minerals will also remain crucial for delivery of all the associated infrastructure which helps to ensure housing is developed in clean, safe and pleasant local environments.

3.63 A lack of available minerals of the right type at the right time could potentially compromise delivery of housing, or else make it more expensive and time-consuming to build. The MLP has a key role to play in ensuring that sufficient quantities of minerals are identified for extraction.

3.64 The delivery of housing could also be compromised if minerals development takes place too close to potential housing sites.

SA Objective 14: Participation by all

3.65 This SA objective is to "Provide opportunities for communities to participate in and contribute to decisions that affect their neighbourhood and quality of life, encouraging pride and social responsibility in the local community".

3.66 Minerals developments are often large scale and last many years, and can generate significant interest from local communities. The MLP has the opportunity to support public engagement in the planning of minerals development, and local people can make a valuable contribution to shaping minerals sites and their restoration.

SA Objective 15: Technology, innovation and inward investment

3.67 This SA objective is to "Promote and support the development of new technologies, of high value and low impact, especially resource efficient technologies and environmental technology initiatives".

3.68 Minerals development is essential to new technologies. Without minerals, key parts of the low-carbon economy could not be delivered. Renewable energy installations, for example, require 'conventional' minerals for ballast, buildings, and associated infrastructure, even though they may also include rarer elements.

3.69 Minerals sites themselves can also provide an opportunity to exploit innovation. More efficient technologies could be employed in the excavation, processing, and movement of minerals, including lower-energy plant and vehicles. It is highly likely that more efficient technologies will emerge within the plan period, and minerals sites that exploit these advances could benefit from reduced energy bills whilst also lowering carbon emissions. This objective therefore has close links with the SA objective on climate change.

SA Objective 16: Population (skills and education)

3.70 This SA objective is to "Raise the skills levels and qualifications of the workforce".

3.71 Minerals sites have the potential to offer employment and training in a wide range of roles, but the ability of the MLP to influence skills and education is limited.

SA Objective 17: Population (crime & fear of crime)

3.72 This SA objective is to "Reduce crime, fear of crime and antisocial behaviour".

3.73 No significant linkages have been identified between minerals development and this SA objective.

The appraisal matrices

3.74 Each spatial/policy option and subsequent proposed area of search/policy was assessed against each SA objective, and a judgement was made with regards to the likely effect that they would have on that objective. These judgements were recorded as a colour coded symbol, as shown below in

3.75 **Figure** 3.1. The sustainability effects are presented in **Chapters 5**, **6**, **7** and **9** and **Appendices 5** and **7** to **11**, along with a brief justification of the judgement made.

Figure 3.1: Key to symbols and colour coding used in the SA of the MLP[14]

++	The policy is likely to have a **significant positive** impact on the SA objective(s).
+	The policy is likely to have a **minor positive** impact on the SA objective(s).
0	The policy is likely to have a **negligible or no impact** on the SA objective(s).
+/-	The policy is likely to have a **mixture of positive and negative** impacts on the SA objective(s).
–	The policy is likely to have a **minor negative** impact on the SA objective(s).
– –	The policy is likely to have a **significant negative** impact on the SA objective(s).
?	It is **uncertain** what effect the policy will have on the SA objective(s).

3.76 A significant positive impact against an SA objective does not imply that the MLP approach is the best it can be. The role of this SA is to identify opportunities to optimise the environmental, social and economic performance of the MLP, and it is therefore possible to award a very positive rating where further improvement is still possible (or, conversely, a very poor rating where some elements of an SA objective are fully met, but others are seriously lacking).

3.77 The SA of spatially-specific options includes the identification of particular assets/receptors (such as listed buildings or sites of special scientific interest) which may be affected, as well as consideration of the wider social, economic and environmental impacts. This means that, alongside quantitative data and 'lines on maps', there is also a need for qualitative appraisal to enable a cohesive view. An example of this wider approach is illustrated through the move in recent years towards green infrastructure, recognising that it is the networks of all spaces, rather than specific individual points, that ensures a robust environment.

Assumptions taken into account during the SA

3.78 SA inevitably relies on an element of subjective judgement. In predicting and assessing the likely sustainability effects of the MLP, the SA team's analysis of the characteristics of Worcestershire and the sustainability issues it faces has been drawn upon as well as the professional experience of the SA team of having undertaken numerous SAs of minerals local plans and site allocations.

3.79 Brief commentaries on how the appraisal has approached each of the objectives are set out in **Appendix 4**, together with indicative thresholds used as decision-making criteria to appraise each of the specific sites, preferred areas, and their alternatives. These thresholds and decision-making criteria have enabled a consistent approach to the assessment of likely effects. These assumptions were developed so that, where possible, quantitative data can be used to appraise the sites. While these can inform the appraisal, the thresholds are not exhaustive and cannot capture all possible issues that will affect a site's performance against the objectives. The indicative thresholds presented in **Appendix 4** were updated between the Third Stage consultation and the Fourth Stage consultation in order to provide further clarification, allow for greater consistency and replicability of assessment and to remove reference to data sources that LUC was not able to access. These changes were discussed with WCC to ensure an appropriate level of consistency between this and previous assessments.

[14] Not all effects were considered appropriate for all SA objectives. See **Appendix 4** for details.

Level of detail in the SA and limitations of the appraisal

3.80 Where possible, the effects of the MLP upon each of the sustainability objectives is considered in terms of short, medium and long-term impacts, as well as their secondary, cumulative and synergistic effects[15]. It must be recognised, however, that the level of detail provided in the draft plan does not always allow for a full, in-depth appraisal.

3.81 The SA has limitations as a strategic tool to aid policy-making; SA cannot provide a full, site-level consideration of every impact of every policy. More localised assessments, such as those made through the planning application process, will be crucial in fully understanding the sustainability of any particular development. Other regulatory regimes (for example Environment Agency permitting, Lead Local Flood Authority sustainable drainage approval, etc.) will also play a role in ensuring that development is appropriately planned and managed. Environmental Impact Assessment will be relevant to proposals coming forward under the plan, and Schedule 2 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) makes clear that development within the "extractive industry" (including quarries, open cast mining and peat extraction (unless included in Schedule 1), and underground mining) will require assessment under the EIA Regulations, except "the construction of buildings or other ancillary structures where the new floorspace does not exceed 1,000 square metres". This means that almost every minerals site will be EIA development and, as such, an Environmental Statement will be required to accompany any planning application.

3.82 Limitations also arise as a result of the SA being a strategic, desk-based appraisal. Because site appraisals have been carried out using GIS and other desktop resources, many of the distances given in the detailed matrices relate to 'point data', rather than shapes. This means, for example, that the distance given from a listed building to a site is the distance from a single point within the curtilage of that listed building. As such, the full area of the listing could be slightly different. This is not the case for some other assets, such as SSSIs, where the boundary is mapped as a polygon. It is assumed that the GIS data relied upon was current at the time of the appraisal, but data is routinely updated and amended as assets are added, removed, or amended.

3.83 GIS data for Local Geological Sites is held by WCC as point data, meaning it is not known how far from the points the designated sites extend. As such, the SA took a precautionary approach in acknowledging anything within, or just outside of, a 1km buffer from these points. This is considered to be consistent with the high-level, strategic nature of SA and the nature of the options being assessed, in that minerals development could come forward within any of the spatial options being considered.

3.84 In terms of assessment of the historic environment, the SA has considered designated assets only. It is acknowledged that there is a range of non-designated assets in the county and that undiscovered archaeological assets could be present at any location. It is outside the scope of the SA to consider these assets, but it is expected that appropriate consideration will be given to these when specific proposals come forward.

3.85 We cannot know with certainty how every aspect of the MLP will materialise during and after delivery of the plan, particularly with regards to strategic corridors and, to a lesser extent, the areas of search. While each corridor and area of search has a defined, mapped boundary, we do not know which developments may come forward within which corridor, or when. In addition, effects will depend on the precise layout and methods of working, processing, and transportation. Much of this information would only become apparent at application stage.

3.86 For some types of impacts, screening for likely significant effects has been determined on a proximity basis, using GIS data to determine the proximity of potential receptors to the spatial

[15] 'Synergistic effects' refers to the interaction or cooperation of two or more outcomes to produce a new or enhanced effect compared to their separate effects.

options that are the subject of the assessment. However, there are many uncertainties associated with using set distances as there are very few standards available as a guide to how far impacts will travel. As such, LUC and WCC have used professional judgement to estimate reasonable distance thresholds.

3.87 It should be noted that the proposed distances from specific assets (e.g. biodiversity, heritage, recreational) used within relevant SA objectives to predict the magnitude of potential effects of allocating the spatial option are for a guide only and will not mean that mineral sites within a certain distance would definitely have an effect in every instance. The potential effects depend significantly on the type and design of mineral sites eventually developed, which will need to be assessed at the planning application stage. All distances given are approximate, and are 'as the crow flies', unless otherwise stated.

3.88 The Areas of Search for Building Stone were only available as point data. The assessments of spatial effects considered the approximate location of the point only, as the extent of the area that may be suitable for building stone extraction is unknown. Uncertainty regarding the extent of these Areas of Search has been reflected in the appraisal matrices.

3.89 The GIS data for waste sites, provided to LUC by WCC, give indicative boundaries of the waste management sites known to and digitised by Worcestershire County Council as the Waste Planning Authority. WCC noted that these may not represent a fully complete or up to date list. The data used is not and does not purport to be an official record of all waste management sites in the county, but it was the best available data at the time of assessment.

3.90 The GIS data regarding locally important parks and gardens was provided to LUC by WCC. WCC has indicated that there is some uncertainty as to whether this constitutes a full and definitive dataset, but it is the best available data at the time of assessment.

3.91 Birmingham Airport is within 13km of the county and is the only "officially safeguarded civil aerodrome" defined by the government within this distance.

Short, medium and long-term effects

3.92 Different sites will come forward at different times, and the duration of workings will vary according to a range of factors, including the prevailing economic conditions and the site operator's particular business plan. In general, minerals sites will be worked for long periods (a minimum of five years, and possibly longer than forty years). As such, although broad estimates could be made of what would be delivered and when, it is considered more appropriate to adopt a less rigid timeframe for what are 'short', 'medium' and 'long-term' effects. This accords with the previous SA, which followed the approach adopted by Essex County Council in its own SA, whereby 'short-term' effects are taken to be those experienced during site development/construction (including infrastructure); 'medium-term' effects are those during site working; and 'long-term' effects are those after final site restoration.

4 Sustainability Context for Minerals Development in Worcestershire

Review of Plans, Policies and Programmes

4.1 The Worcestershire Minerals Local Plan is not being prepared in isolation and is greatly influenced by other plans and programmes and by broader sustainability objectives. The Plan needs to be consistent with international and national guidance and strategic planning policies, and should contribute to the goals of a wide range of other programmes and plans. It must also conform to environmental protection legislation and the sustainability objectives established at the international, national and local levels.

4.2 Schedule 2 of the SEA Regulations requires:

(1) "an outline of the…relationship with other relevant plans or programmes"; and

(5) "the environmental protection objectives established at international, Community or Member State level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation"

Relationship between MLP and other relevant plans and programmes, including their environmental protection objectives

4.3 A review has been undertaken of the other plans, policies and programmes that are relevant to the MLP. This was originally undertaken at the Scoping stage but has been updated to ensure the review is up to date. The updated review is included in **Appendix 2** which, in line with the SEA Regulations requirements, identifies the relationship that the plans and policies have with the development of the MLP, and also shows how the environmental, social and economic objectives contained within those plans and policies have been taken into account during preparation of the MLP and also the SA.

4.4 A significant development in terms of the policy context for the MLP was the publication of the National Planning Policy Framework (NPPF), which replaced the suite of Planning Policy Statements (PPSs) and Planning Policy Guidance, including Minerals Policy Statements and Minerals Policy Guidance documents. This also resulted in the publication of national Planning Practice Guidance[16] (PPG) as a web-based resource that accompanies the NPPF. A large majority of past guidance has been included in the PPG; however, many guidance documents were also cancelled. A revised version of the NPPF was published in July 2018, with a further revision in February 2019.

4.5 The MLP must be consistent with the requirements of the NPPF, which sets out information about the purposes of local plan-making. The NPPF emphasises that the purpose of the planning system is to contribute to the achievement of sustainable development, which should be delivered through the preparation and implementation of plans and the application of the policies in the Framework.

4.6 With respect to Areas of Outstanding Natural Beauty (AONB) (the Malvern Hills AONB and Cotswolds AONB are partially within Worcestershire) the NPPF acknowledges that specific designated landscapes may indicate development should be restricted. Paragraph 172 of the NPPF states that 'great weight should be given to conserving and enhancing landscape and scenic

[16] DCLG (2014). Planning Practice Guidance. Available at: http://planningguidance.planningportal.gov.uk/

beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads. The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major development other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest. Consideration of such applications should include an assessment of:

- The need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy;
- The cost of, and scope for, developing outside the designated area, or meeting the need for it in some other way; and
- Any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.'

4.7 While the NPPF replaces a number of former Minerals Policy Statements, the principles for minerals planning are still retained in the NPPF[17] including:

- The maintenance of landbanks for crushed rock and sand and gravel.
- Designation of Mineral Safeguarding Areas.
- Safeguarding existing, planned and potential sites for bulk transport, handling and processing of minerals; the manufacture of concrete and concrete products; and the handling, processing and distribution of substitute, recycled and secondary aggregate material.
- Providing for restoration and aftercare at the earliest opportunity and to high environmental standards.
- Setting out criteria against which planning applications will be assessed to ensure that planned operations do not have unacceptable adverse impacts on the natural and historic environment or human health, taking into account the cumulative effects.

4.8 Other relevant plans, policies and programmes include European directives for environmental protection, including the Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC), which led to the designation of European sites and HRA. Directives relating to water quality, air quality, flooding, waste and noise, and the legislation by which these are translated into UK law, set a series of requirements for member states to minimise adverse impacts on the environment.

4.9 There are also a number of international treaties relating to environmental protection ratified by the UK, including conventions relating to landscape and the historic environment. The UK also has a role to play in the EU Sustainable Development Strategy.

4.10 Other relevant plans, policies and programmes at a national scale include environmental legislation, such as the Environment Act (1995) and the Natural Environment and Rural Communities (NERC) Act (2006). There is also a suite of relevant national guidance and white papers with regards to the built, historic and natural environment, as well as sport. National plans, policies and programmes that specifically address minerals development include the NPPF, PPG, National Planning Policy for Waste (2014), the National and Regional Guidelines for Aggregates Provision in England 2005-2020 and Nature After Minerals: How Mineral Site Restoration Can Benefit People and Wildlife (2006).

4.11 At the regional level, there is a Strategic Economic Plan for the West Midlands, the West Midlands Energy Strategy (2004) and a regional Sustainable Development Framework (2006). At the

[17] See section 17 of the NPPF, available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

county and local scale, Worcestershire has strategies and guidance for sustainable development, Green Infrastructure, climate change, landscape and the historic environment, all of which help to promote sustainable development.

4.12 The key points emerging from the document review that the Minerals Local Plan may be able to positively influence (either directly or indirectly) are outlined below:

Social

- Enabling communities to participate in and contribute to the issues that affect them.
- Addressing health inequalities.

Environmental

- Increasing the use of renewable energy: 20% of the UK electricity should come from renewable energy sources by 2020.
- Encouraging and promoting land use activities which will lead to an improvement in the quality of natural resources.
- Development should be informed by, and sympathetic to, the landscape character of the locality.
- Protection of the county's natural and cultural heritage.

Economic

- Ensuring prudent and efficient use of natural resources.
- Ensuring the efficient transportation of freight within the county, to support a strong economy, but ensuring the environmental impacts are minimised.
- Enabling wider development, through ensuring minerals requirements can be met as far as possible from within Worcestershire. Viability and deliverability of development could be threatened if minerals have to be imported over longer distances.

Baseline Information

4.13 This section addresses the SEA Regulations requirements in Schedule 2:

(2) The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan.

(3) The environmental characteristics of areas likely to be significantly affected.

(4) Any existing environmental problems which are relevant to the plan including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC on the conservation of wild birds and the Habitats Directive.

4.14 Baseline information provides the context for assessing the sustainability of proposals in the MLP and it provides the basis for identifying trends, predicting the likely effects of the plan and monitoring its outcomes. There are no specific requirements for what baseline data must be included, and the scope and availability of baseline data varies widely, but it must be relevant to environmental, social and economic issues, be sensitive to change and should ideally relate to records which are sufficient to identify trends.

4.15 The baseline data focuses on key indicators which are readily available and can be updated to illustrate the environmental, social and economic issues. The choice of baseline data has been informed by the previous stages in the SA process. Potentially a key limitation of the SA process is gaps in baseline data. **Appendix 3** of this report provides an extensive discussion on the

relevant baseline information for Worcestershire and of the way in which this may be affected by minerals development.

4.16 As an integrated SA and SEA is being carried out, baseline information relating to other 'sustainability' topics (beyond environmental topics listed in the SEA Regulations) has also been included, for example information about housing, social inclusiveness, transport, energy, minerals and economic growth.

Key Sustainability Issues

4.17 Identification of the key sustainability issues, and consideration of how these issues might develop over time if the MLP is not prepared, help to meet the requirements of Schedule 2 of the SEA Regulations to provide information on:

(2) The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan; and

(4) Any existing environmental problems which are relevant to the plan.

4.18 Key sustainability issues facing Worcestershire were identified during the Scoping stage of the SA and were presented in the Scoping Report. These issues have been reviewed to ensure they are up-to-date. These issues can be summarised as:

- From 2013 to 2015 there had been a slight decrease in overall proportion of **SSSIs** meeting either 'favourable' or 'unfavourable recovering' standard, however, the latest data from 2018 shows that 95.49% of selected sites now meet these standards. There has been a steady increase in the proportion of SSSIs within Worcestershire in 'favourable' or 'unfavourable recovering' condition.

- Although regional and national comparators are not yet known, too few **local wildlife and geological sites** in Worcestershire are under appropriate management, which generally means their condition is poor (although it should be noted that the latest update is from 2010).

- Recorded populations of **breeding birds** are falling, particularly in the case of the bullfinch. This situation reflects the pattern nationally, and is largely occurring as a result of agricultural practices (although it should be noted that the latest update is from 2010).

- Worcestershire **water courses** do not compare favourably with those in the wider area. Only 10.26% watercourses within Worcestershire are classified as 'good' status.

- There has been an overall fall in **CO_2 emissions per capita** since 2009. These emissions are now slightly above both the national figure and the West Midlands average. In relation to the 2016 population estimates for each district, Bromsgrove, Malvern Hills and Wychavon had the highest CO_2 emissions per capita.

- Since 2014, Worcestershire and each district within it have had increased **CO_2 emissions for road transport**.

- Worcestershire has the second largest percentage land area at risk of **flooding** in the West Midlands (although it should be noted that, in terms of numbers of households at risk, Worcestershire is performing better than the national average).

- **Air quality** in some areas of the county is improving, but in others is decreasing. The number of Air Quality Management Areas in Worcestershire has been constant since 2012.

4.19 Alongside identification of environmental problems required by the SEA Directive, a series of additional social and economic problems have emerged, which can be summarised as follows:

- The **employment** rate in Worcestershire is better than both the national and regional averages, and has increased significantly since 2016.
- Worcestershire's **GVA** per hour worked is below that of England, but above the West Midlands, and it is expected to continue to increase faster than regional or national GVA per hour worked.
- During 2017/18 some 984 **affordable homes** were built in Worcestershire, which was an increase from previous years, 2015/16 and 2016/17.

5 Sustainability Appraisal Findings: Context

Summary of key findings

5.1 This section of the SA considers the sustainability implications of each of the MLP sections in turn. These findings are mainly taken from the more detailed appraisal matrices found in the appendices. General observations on sustainability are also made on those parts of the MLP that are not policies (for example, the more contextual commentary at the beginning of the Plan).

Introduction

5.2 No sustainability issues have been identified within the Introduction.

Portrait of Worcestershire

5.3 No sustainability issues have been identified within the Portrait of Worcestershire.

Vision

5.4 The Vision for the Worcestershire Minerals Local Plan sets out a vision for mineral development in Worcestershire, setting out what the Plan is aiming to achieve by 2035. The Vision encourages sustainable development as required by the NPPF, and is likely to have a positive effect on the majority of the SA Objectives as shown in **Table 5.1**.

5.5 Positive effects have been identified for fourteen of the SA objectives, including SA objectives 1: Landscape, 2: Biodiversity and geodiversity, 3: Cultural heritage, architecture and archaeology, 4: Material assets, 5: Natural resources, 6: Climate change and energy, 7: Flooding, 8: Access to services, 9: Health and amenity, 10: Waste, 11: Traffic and transport, 12: Growth with prosperity for all, 13: Provision of housing and 14: Participation by all.

5.6 References to "the holistic approach to…enhancing the natural…environment" and to "the need to achieve final landforms and restoration that deliver multifunctional benefits and is appropriate in the landscape" should help to deliver the safeguarding element of SA objective 1: Landscape. The enhancement of the landscape should also help to strengthen landscape character and to minimise any negative visual impacts.

5.7 SA objective 2: Biodiversity and geodiversity is supported by the vision, as the vision requires mineral sites to take a "holistic approach to… enhancing the natural… environment". Whilst the vision doesn't specifically make reference to the words 'biodiversity' or 'geodiversity', both are components of green infrastructure, and the vision states that the mineral sites will be designed to deliver and enhance multifunctional green infrastructure. The inclusion of the above reference to multifunctional green infrastructure should also help to deliver SA objective 3: Cultural heritage, architecture and archaeology. The vision states that mineral sites development in Worcestershire will work towards "enhancing the built, historic … environment". This further supports SA objective 3, and should ensure that the historic environment is preserved and enhanced throughout the lifetime of mineral sites.

5.8 The vision supports the safeguarding of minerals (SA Objective 4: Material assets), as it requires mineral sites to "make best use of substitute, secondary and recycled minerals and waste to minimise the need for primary materials". The enhancement of green infrastructure is also explicitly supported. This should also help to achieve SA objective 5: Natural resources, as GI

can help regulate air and water quality. The reference to "a holistic approach to…enhancing the natural and water environment" should also support SA objective 5, despite air and water quality not being specifically referred to within the vision. In addition, the vision recognises the need to mitigate and adapt to the impacts of climate change. It also calls for energy efficiency and for mineral development to optimise on-site energy provision from renewable and low-carbon sources. Therefore, overall, the vision is likely to have a significant positive effect on SA Objective 6.

5.9 The vision's recognition of the need to "recycle minerals and minerals waste in order to reduce the need for primary materials" accords with the waste hierarchy, and the guidance set out in the NPPF. Therefore, the MLP vision is likely to have a minor positive effect on SA objective 10.

5.10 The vision's requirement for mineral development, including transportation to be "water and energy efficient" is expected to have a minor positive uncertain effect on SA Objective 11, as this may help to ensure that transportation modes are more sustainable.

5.11 The vision highlights that minerals development in Worcestershire will help to deliver sustainable economic growth. This should have a significant positive effect on SA Objectives 12: Growth with prosperity for all and 13: Provision of housing. SA Objective 13: Provision of housing should be further strengthened by the vision's requirement to provide a "steady, adequate and sustainable supply" of minerals. This should support sustainable and progressive housing construction in Worcestershire. The vision's requirement for "identified issues to be addressed through effective community engagement" should have a significant positive effect on SA objective 14: Participation by all, as this gives local communities the opportunity to participate in matters which are likely to affect their neighbourhood.

5.12 No effects have been identified for three of the SA objectives, including 15: Technology, innovation and investment, 16: Population (skills and education) and 17: Population: (crime). The vision's requirement for mineral sites to deliver and enhance multifunctional green infrastructure is likely to positively contribute to meeting objectives 7: Flooding, 8: Access to services and 9: Health and amenity, therefore the vision is likely to have a positive effect on these SA objectives. In addition, the vision's requirement to "support health and quality of life", is likely to have a significant positive effect on SA objective 9: Health and amenity. In addition, the vision's requirement for mineral sites to be water and energy efficient could indirectly support SA objective 15: Technology, innovation and investment, as technological solutions could play a role in ensuring that the proposed sites are environmentally enhanced. However, as there is no direct linkage between technological solutions and the vision's plans, negligible uncertain effects were identified for this objective.

Minerals Local Plan Objectives

5.13 The Objectives for the MLP are generally compatible with and supportive towards achievement of the SA objectives, although there is also no relationship between a number of the SA objectives and the MLP Objectives tend to focus on quite specific issues.

5.14 No effects were identified for MO 1 (enable the supply of minerals) in relation to most SA objectives. MO 1 (enable the supply of minerals) is only likely to have a significant positive effect on SA objective 13: Provision of housing, as the supply of minerals is likely to directly support the ability to provide decent affordable housing for all. A minor positive/unknown impact was identified for SA Objective 15: Technology, innovation and investment, as the development of new technologies could enable the supply of minerals to be maximised. However, the extent to which technology could be implemented is unknown. An uncertain effect was identified for SA Objective 11: Traffic and transport, as it is unclear whether the supply of minerals will have an impact on reducing distances materials travel to market.

5.15 It is considered that MLP Objectives 2 (protect and enhance the function of green space networks and natural elements [GI]) and 3 (protect and enhance the quality, character and distinctiveness of the built, historic, natural and water environment) could have a significant positive effect on SA objectives 1: Landscape and 2: Biodiversity and geodiversity, and MLP objective 3 (protect and enhance the quality, character and distinctiveness of the built, historic, natural and water

environment) could also have a significant positive impact on SA objectives 3: Cultural heritage, architecture and archaeology and 4: Material assets. The requirement for mineral sites to protect and enhance the function of GI could help to ensure that landscape character is safeguarded and strengthened (SA objective 1). The inclusion of 'natural elements' within MLP Objective 2 is expected to incorporate the conservation of biodiversity and geodiversity assets (SA objective 2). SA Objectives 1: Landscape, 2: Biodiversity and geodiversity, 3: Cultural heritage, architecture and archaeology and 4: Material asset) and 5: Natural resources should be supported by the wording of MLP Objective 3 "protect and enhance the quality, character and distinctiveness of the built, historic, natural and water environment". This is expected to cover landscape character, the conservation of biodiversity and geodiversity, preservation and enhancement of the historic environment and the safeguarding of highly valued land. As the historic environment is considered to be an important element of green infrastructure, it is likely that enhancing the function of green space networks (MLP Objective 2) will positively impact SA Objective 3: Cultural heritage, architecture and archaeology, however the extent to which MLP Objective 2 will strengthen SA Objective 3 remains unclear.

5.16 MLP Objective 2 (protect and enhance the function of green space networks and natural elements [GI]) and MLP Objective 3 (protect and enhance the quality, character and distinctiveness of the built, historic, natural and water environment) are likely to have minor positive uncertain effects on SA Objectives 6: Climate change and energy, 7: Flooding and 9: Health and amenity, and MLP Objective 2 is also expected to have a minor positive uncertain effect on SA Objective 5: Natural resources. Although air and water quality are not directly mentioned within MLP objectives 2 or 3, enhancing the function of green space networks (SA objective 2), and enhancing the "quality and character of … natural and water environments" (SA objective 3) should ensure that water and air quality is included and considered during and after the lifetime of the proposed mineral sites.

5.17 SA Objective 6: Climate change and energy is also likely to be positively impacted by MLP objectives 2 and 3, which seek to protect and enhance green space networks and the natural environment. Green spaces and natural assets are widely regarded as carbon sinks and climate regulators, therefore achieving MLP Objectives 2 and 3 will support the adaptation element of the climate change and energy objective (SA Objective 6). However, it is unclear as to what the extent of the effects will be, as the nature, location and scale of proposed green spaces are unknown.

5.18 Similarly, MLP objectives 2 and 3 are likely to have a minor positive/unknown effect on SA Objective 7: Flooding. References to enhancing green infrastructure (MLP objective 2) and "protecting the quality of … the natural and water environment" (MLP Objective 3) should ensure that surface water flooding is minimised by the implementation of natural flood management schemes. Health and amenity within Worcestershire (SA objective 9: Health and amenity) should also be positively impacted through enhancing green infrastructure (MLP Objective 2) and "enhancing the quality of … the natural environment" (MLP Objective 3), as it is widely acknowledged that the provision of green infrastructure has beneficial impacts for the health and well-being of communities living in close proximity.

5.19 Overall, MLP objective 2 (protect and enhance the function of green space networks and natural elements [GI]) is likely to have no effect on ten of the SA Objectives, and MLP Objective 3 (protect and enhance the quality, character and distinctiveness of the built, historic, natural and water environment) is likely to have no effect on nine of the SA objectives.

5.20 No effects were identified for MLP Objective 4 (protect and enhance the heath, well-being, safety and amenity of people and communities) in relation to all SA Objectives, except SA objectives 8: Access to services, 9: Health and amenity and 13: Provision of housing. A minor positive uncertain effect was identified for SA objective 8: Access to services as it is likely that access to services will be considered within the "enhance…the amenity of people and local communities" section of MLP objective 4. In addition, a significant positive effect was identified for SA objective 9: Health and amenity. This can be attributed to the inclusion of "protect and enhance the health and wellbeing… of people and local communities" within MLP objective 4. This aligns to the wording of SA objective 9 which also seeks to improve the health and wellbeing of the population. In relation to SA objective 13, the requirement for minerals sites to "protect and enhance the well-being and safety of local communities" should ensure that the provision of housing leads to

the creation of safe and pleasant local environments, therefore a significant positive effect was identified for this SA Objective.

5.21 MLP objective 5 (protect and enhance the vitality of the local economy) is likely to have no effect on all SA Objectives, except SA Objectives 12: Growth with prosperity for all and 15: Technology, innovation and investment. In relation to SA objective 12: Growth with prosperity for all, it is likely that MLP objective 5 will have a significant positive effect on the SA objective, as enhancing the vitality of the economy is likely to support the development of a "knowledge-driven economy". However, MLP objective 5 does not address other aspects of SA objective 12, such as the requirement to "develop… the infrastructure and skills base whilst ensuring all share the benefits". It is considered that MLP objective 5 (protect and enhance the vitality of the local economy) is likely to have a minor positive uncertain impact on SA objective 15: Technology, innovation and investment, as enhancing the vitality of the local economy is likely to involve attracting inward investment and supporting the development of new technologies, although the extent of this is uncertain.

5.22 It is considered that MLP objective 6 (ensure the prudent use of natural resources) is likely to have no effect on twelve of the SA objectives. MLP objective 6 is likely to have a minor positive uncertain effect on SA objectives 1: Landscape and 2: Biodiversity and geodiversity, 5: Natural resources and 10: Waste, as MLP objective 6's reference to ensuring "the prudent use of natural resources" could have positive implications for safeguarding the landscape character, conserving Worcestershire's biodiversity and geodiversity assets, protecting and enhancing water and air quality and the efficient management of waste. However, MLP objective 6 (ensure prudent use of natural resources) does not reference these specific natural resources, therefore an element of this effect is unknown. "Ensuring the prudent use of natural resources" (MLP objective 6) is likely to have a significant positive effect on SA objective 4: Material assets, as both objectives seek to carefully consider the safeguarding and usage of natural resources. In accordance with SA objective 4, mineral sites should ensure "efficient use of land through the safeguarding of mineral reserves".

Key diagram

5.23 The key diagram is not considered to raise any substantive sustainability issues, as it merely describes the policies of the plan, which have been appraised elsewhere in this SA.

Table 5.1: Summary of SA scores for the Proposed Vision and Strategic Objectives

Vision and Objectives SA Objectives	Vision	1. Enable the supply of minerals	2. Protect and enhance the function of green space networks and natural elements (GI)	3. Protect and enhance the quality, character and distinctiveness of the built, historic, natural and water environment	4. Protect and enhance the health, well-being, safety and amenity of people and communities	5. Protect and enhance the vitality of the local economy	6. Ensure the prudent use of natural resources
1: Landscape	++	0	++	++	0	0	+?
2: Biodiversity and geodiversity	+	0	++	++	0	0	+?
3: Cultural heritage, architecture and archaeology	++	0	+?	++	0	0	0
4: Material assets	++	0	0	++	0	0	++
5: Natural resources	+	0	+?	++	0	0	+?
6: Climate change and energy	++	0	+?	+?	0	0	0
7: Flooding	+	0	+?	+?	0	0	0
8: Access to services	+	0	0	0	+?	0	0
9: Health and amenity	++	0	+?	+?	++	0	0
10: Waste	+	0	0	0	0	0	+?
11: Traffic and transport	+?	?	0	0	0	0	0

Vision and Objectives SA Objectives	Vision	1. Enable the supply of minerals	2. Protect and enhance the function of green space networks and natural elements (GI)	3. Protect and enhance the quality, character and distinctiveness of the built, historic, natural and water environment	4. Protect and enhance the health, well-being, safety and amenity of people and communities	5. Protect and enhance the vitality of the local economy	6. Ensure the prudent use of natural resources
12: Growth with prosperity for all	++	0	0	0	0	++	0
13: Provision of housing	++	++	0	0	++	0	0
14: Participation by all	++	0	0	0	0	0	0
15: Technology, innovation and inward investment	0?	+?	0	0	0	+?	0
16: Population (skills and education)	0	0	0	0	0	0	0
17: Population (crime & fear of crime)	0	0	0	0	0	0	0

6 Sustainability Appraisal Findings: Areas of Search

6.1 This section of the SA summarises the sustainability implications of the spatial options, i.e. the Areas of Search, considered for inclusion in the SA. There are 167 Areas of Search identified in the MLP within five categories:

- Building Stone (13 Areas of Search) – see **Table 6.1**.
- Terrace and Glacial Sand and Gravel (70 Areas of Search) – see **Table 6.2**.
- Silica Sand (41 Areas of Search) – see **Table 6.3**.
- Solid Sand and Gravel (30 Areas of Search) – see **Table 6.4**.
- Brick Clay (13 Areas of Search) – see **Table 6.5**.

6.2 More detailed appraisal matrices for each of the spatial options can be found in **Appendices 7** to **11**.

Building Stone Areas of Search

Table 6.1: SA scores for building stone areas of search

AoS Ref	SA1: Landscape	SA2: Biodiversity and geodiversity	SA3: Cultural heritage, architecture and archaeology	SA4: Material assets	SA5: Natural Resources	SA6: Climate change and energy	SA7: Flooding	SA8: Access to services	SA9: Health and amenity	SA10: Waste	SA11: Traffic and transport	SA12: Growth with prosperity for all	SA13: Provision of housing	SA14: Participation by all	SA15: Technology, innovation and inward investment	SA16: Population (skills and education)	SA17: Population (crime & fear of crime)
HSBQ1	-?	--?	-?	-	--?	--	0	-?	--	0	-	+	0	0	0	0	0
HSBQ2	-?	--?	-?	-	--?	--	0	-?	--	0	-	+	0	0	0	0	0
HSBQ3	-?	--?	--?	-	-?	-	0	0	--?	0	-	+	0	0	0	0	0
HSBQ4	-?	--?	--?	-	--?	--	0	0	--	0	-	+	0	0	0	0	0
HSBQ5	-?	--?	--?	-	-	--	0	-?	-	0	-	+	0	0	0	0	0
HSBQ6	-?	-?	--?	-	-	-	0	-?	0	0	-	+	0	0	0	0	0
HSBQ7	-?	--?	--?	-?	--?	-	0	-?	-?	0	-	+	0	0	0	0	0
HSBQ8	-?	--?	--?	-?	-	-	0	-?	0	0	-	+	0	0	0	0	0
HSBQ9	-?	--?	--?	-	-	--	0	0	0	0	-	+	0	0	0	0	0
HSBQ10	-?	--?	--?	-	-	-	0	0	0	0	-	+	0	0	0	0	0
HSBQ11	-?	--?	--?	-	-	-	0	0	0	0	-	+	0	0	0	0	0
HSBQ12	-?	--?	--?	-	-	-	0	0	0	0	-	+	0	0	0	0	0
HSBQ13	--?	--?	0?	-	--?	-	0	-?	--	0	-	+	0	0	0	0	0

SA Objective 1: Landscape

6.3 The majority of the areas of search are expected to have a minor negative uncertain effect in relation to SA objective 1: Landscape because they are only adjacent to a few sensitive receptors.

6.4 HSBQ13 is the only area of search where a significant negative effect is likely as the area contains or is adjacent to a number of sensitive receptors. Therefore, impacts on the landscape could lead to a significant negative effect. All effects are uncertain, as the areas of search are represented as a point, therefore the exact location and size of any minerals workings that could come forward is unknown.

SA Objective 2: Biodiversity and Geodiversity

6.5 All of the areas of search, except HSBQ6, are expected to have a significant negative effect with uncertainty in relation to SA2: Biodiversity and Geodiversity, because they each fall within proximity to a SSSI and some are also located within 1.5km of locally designated biodiversity and/or geodiversity sites, which could be damaged or degraded by minerals development.

SA Objective 3: Cultural Heritage, Architecture and Archaeology

6.6 Significant negative effects with uncertainty are likely for the majority (77%) of the building stone areas of search in relation to SA Objective 3. This is due to them containing, or lying adjacent to, national historic environment sites, which could potentially be compromised as a result of minerals development. In some cases, significant negative effects have also been predicted for areas of search as a result of potential for inter-visibility or other disturbance to statutorily designated heritage assets within proximity of the site.

6.7 Minor negative effects with uncertainty are likely for two of the building stone areas of search (HSBQ1 and HSBQ2). In these instances, these effects have been predicted as a result of close proximity to Conservation Areas or locally important historic parks and gardens.

6.8 Negligible effects with uncertainty are likely for one of the building stone areas of search (HSBQ13). In this instance, these effects have been predicted as a result of the area of search being a sufficient distance from any national historic environment sites, Conservation Areas or locally important historic parks and gardens and having limited visual interaction with these, although effects depend on the exact location and scale of development.

6.9 For building stone areas of search, all effects are uncertain due to the use of GIS point data, which means the exact location and size of any minerals development that could come forward is unknown, therefore mineral extraction could take place closer to heritage assets than expected.

SA Objective 4: Material Assets

6.10 All of the areas of search are expected to have a minor negative effect in relation to SA objective 4: Material Assets. This is because all but two areas of search are situated within the Green Belt. HSBQ7 and HSBQ8 are not in the Green Belt, but are still expected to have a minor negative effect as they consist of Grade 3 agricultural land. These minor negative effects are uncertain, as it is not known if the land is Grade 3a (which is considered best and most versatile) or Grade 3b (which is not).

SA Objective 5: Natural Resources

6.11 Five of the areas of search are expected to have a significant negative effect in relation to SA objective 5: Natural Resources, as they lie adjacent to waterbodies, sensitive receptors and/or AQMAs. These effects are uncertain, as the areas of search are represented as a point in the GIS data, therefore the exact location and size of any minerals workings that could come forward is unknown.

6.12 On the other hand, eight of the areas of search are expected to lead to minor negative effects, as they are situated within Source Protection Zone 3 and are not within close proximity of a water body or any sensitive receptors.

SA Objective 6: Climate Change and Energy

6.13 Over half of the areas of search are expected to have a minor negative effect in relation to SA6: Climate Change and Energy, because they do not contain or lie adjacent to more sustainable means of transport, namely suitable water links, but would not result in a significant net loss of tree cover.

6.14 Five areas of search are expected to have a significant negative effect in relation to SA6: Climate Change and Energy, because they too do not contain or lie adjacent to more sustainable means of transport, however minerals development in the area is expected to result in a significant net loss of tree cover.

SA Objective 7: Flooding

6.15 All of the areas of search are expected to have a negligible effect in relation to SA7: Flooding, because none of the areas are within Flood zone 3, although minerals development could have some minimal implications for flood risk.

SA Objective 8: Access to Services

6.16 Minor negative effects with uncertainty are likely for seven of the building stone areas of search, due to them being adjacent to at least one Public Right of Way. Minerals development could lead to severance or diversion of these which may limit people from accessing health, educational or other key local services in nearby settlements. All effects are uncertain due to the use of GIS point data, which means the exact location and size of any minerals development that could come forward is unknown, therefore minerals extraction may take place closer or further away than expected from Public Rights of Way.

6.17 The remaining areas of search are all likely to have no impact on access to services, as minerals development is not expected to coincide with any Public Rights of Way.

SA Objective 9: Health and Amenity

6.18 Five of the areas of search are expected to have a significant negative effect in relation to SA objective 9, as they are located within 100m of a range of sensitive receptors, such as residential areas, outdoor sports/recreation sites and Public Rights of Ways.

6.19 Six of the areas of search are expected to result in a no effect as they do not lie within 13km of Birmingham Airport or 100m of any sensitive receptors.

SA Objective 10: Waste

6.20 All of the areas of search are expected to have no effect in relation to SA10: Waste, because none of the areas of search are located within 250m of existing waste infrastructure.

SA Objective 11: Traffic and Transport

6.21 All areas of search are expected to have a minor negative effect in relation to SA11: Traffic and Transport, because they will likely require road-based movement by HGVs, as there are no sustainable means of transport within or adjacent to the area.

SA Objective 12: Growth with Prosperity for All

6.22 All building stone areas of search scored a minor positive effect in relation to SA Objective 12. This is due to them being located over 250m from any areas allocated for employment development or proposed infrastructure delivery and because all new minerals development in the area will provide new employment opportunities.

SA Objective 13: Provision of Housing

6.23 All building stone areas of search are likely to have no effect in relation to SA objective 13 due to them being located over 250m from any areas allocated for the provision of housing.

SA Objective 14: Participation by All

6.24 All of the areas of search are expected to have no effect in relation to SA14: Participation by All, because the locations of the areas will not affect the ability of communities to participate in decisions regarding minerals development.

SA Objective 15: Technology, Innovation and Inward Investment

6.25 All of the areas of search are expected to have no effect in relation to SA15: Technology, Innovation and Inward Investment, because the areas will not affect new technologies and innovation.

SA Objective 16: Population (skills and education)

6.26 All of the areas of search are expected to have no effect in relation to SA16: Population (skills and education), because the location of the areas will not affect skills and education.

SA Objective 17: Population (crime & fear of crime)

6.27 All of the areas are expected to have no effect in relation to SA17: Population (crime & fear of crime), because they will not affect crime and the fear of crime.

Terrace and Glacial Sand and Gravel Areas of Search

Table 6.2: SA scores for terrace and glacial sand and gravel areas of search

AoS Ref	SA1: Landscape	SA2: Biodiversity and geodiversity	SA3: Cultural heritage, architecture and archaeology	SA4: Material assets	SA5: Natural Resources	SA6: Climate change and energy	SA7: Flooding	SA8: Access to services	SA9: Health and amenity	SA10: Waste	SA11: Traffic and transport	SA12: Growth with prosperity for all	SA13: Provision of housing	SA14: Participation by all	SA15: Technology, innovation and inward investment	SA16: Population (skills and education)	SA17: Population (crime & fear of crime)
TGSG1	--?	--	--?	-?	-	-	0	--?	-?	0	-	+	+	0	0	0	0
TGSG2	--?	--	0?	-?	-	-	0	--?	-?	0	-	+	+	0	0	0	0
TGSG3	--?	--	--?	-?	--	+?	0	--?	--	0	+?	+	+	0	0	0	0
TGSG4	--?	--	--?	-	--?	-	0	--?	--?	-	-	+	+	0	0	0	0
TGSG5	-?	--	-?	-	--?	-	0	--?	-?	-	-	+	+	0	0	0	0
TGSG6	--?	--	--?	-	--?	-	0	--?	--?	-	-	+	--?/+	0	0	0	0
TGSG7	--?	--	--?	-	--?	-	0	--?	--?	-	-	+	+	0	0	0	0
TGSG8	--?	--	--?	-	--	-	0	--?	-?	0	-	+	+	0	0	0	0
TGSG9	--?	--	--?	-	--?	+?	0	--?	--?	-	+?	+	+	0	0	0	0
TGSG10	-?	--	0?	-	-?	-	0	0	-?	0	-	+	+	0	0	0	0
TGSG11	--?	--	0	-	-?	-	0	--?	-?	0	-	+	+	0	0	0	0
TGSG12	-?	--	--?	-	-	-	0	-?	-?	0	-	+	+	0	0	0	0
TGSG13	--?	--	--?	-	--?	+?	0	--?	--?	0	+?	+	+	0	0	0	0
TGSG14	--?	--	--?	-	--	-	0	-?	--?	-	-	+	+	0	0	0	0
TGSG15	--?	--	0?	-	--?	+?	0	-?	--?	0	+?	+	--?/+	0	0	0	0
TGSG16	--?	--	--?	-	--?	-	0	--?	--?	0	-	+	+	0	0	0	0

AoS Ref	SA1: Landscape	SA2: Biodiversity and geodiversity	SA3: Cultural heritage, architecture and archaeology	SA4: Material assets	SA5: Natural Resources	SA6: Climate change and energy	SA7: Flooding	SA8: Access to services	SA9: Health and amenity	SA10: Waste	SA11: Traffic and transport	SA12: Growth with prosperity for all	SA13: Provision of housing	SA14: Participation by all	SA15: Technology, innovation and inward investment	SA16: Population (skills and education)	SA17: Population (crime & fear of crime)
TGSG17	--?	--	0?	-	--	-	0	--?	--	0	-	+	+	0	0	0	0
TGSG18	--?	--	0?	-	--?	-	0	-?	--	0	-	+	+	0	0	0	0
TGSG19	-?	--	-?	-	-	-	0	0	0	0	-	+	+	0	0	0	0
TGSG20	--?	--	-?	-	--?	-	0	0	0	0	-	+	+	0	0	0	0
TGSG21	--?	--	--?	-	--	-	0	--?	--	0	-	+	+	0	0	0	0
TGSG22	--?	--	--?	-	--	-	0	--?	--	0	-	+	+	0	0	0	0
TGSG23	--?	--	--?	-	-	-	0	--?	--	0	-	+	+	0	0	0	0
TGSG24	--?	--	--?	-	-	-	0	--?	-?	0	-	+	+	0	0	0	0
TGSG25	--?	--	--?	-	-	-	0	0	0	0	-	+	+	0	0	0	0
TGSG26	--?	--	--?	-	--?	+?	0	-?	--?	0	+?	+	+	0	0	0	0
TGSG27	-?	--	--?	-	--?	+?	0	--?	--?	0	+?	+	+	0	0	0	0
TGSG28	--?	--	--?	-	--?	+?	0	--?	--?	0	+?	+	+	0	0	0	0
TGSG29	--?	--	--?	-	0	-	0	--?	--	0	-	+	--?/+	0	0	0	0
TGSG30	--?	--	--?	-	--?	-	0	--?	--	0	-	+	+	0	0	0	0
TGSG31	--?	--	--?	--	--?	+?	0	--?	--?	0	+?	+	+	0	0	0	0
TGSG32	--?	--	--?	-	--?	+?	0	--?	--?	0	+?	+	--?/+	0	0	0	0
TGSG33	--?	--	--?	-?	--?	-	0	--?	--?	0	-	+	+	0	0	0	0
TGSG34	--?	--	--?	-	--?	-	0	--?	--	0	-	+	+	0	0	0	0
TGSG35	--?	--	--?	-	0	-	0	--?	-	0	-	+	+	0	0	0	0
TGSG36	--?	--	--?	--?	--	-	0	--?	--	0	-	+	+	0	0	0	0

AoS Ref	SA1: Landscape	SA2: Biodiversity and geodiversity	SA3: Cultural heritage, architecture and archaeology	SA4: Material assets	SA5: Natural Resources	SA6: Climate change and energy	SA7: Flooding	SA8: Access to services	SA9: Health and amenity	SA10: Waste	SA11: Traffic and transport	SA12: Growth with prosperity for all	SA13: Provision of housing	SA14: Participation by all	SA15: Technology, innovation and inward investment	SA16: Population (skills and education)	SA17: Population (crime & fear of crime)
TGSG37	--?	--	--?	-	--?	-	0	--?	--	0	-	+	--?/+	0	0	0	0
TGSG38	--?	--	--?	-?	0	-	0	--?	--	0	-	+	--?/+	0	0	0	0
TGSG39	--?	--	--?	--?	--	+?	0	--?	--	-	+?	+	--?/+	0	0	0	0
TGSG40	--?	--	--?	-?	--?	-	0	--?	--?	-	-	+	-?/+	0	0	0	0
TGSG41	--?	--	--?	-	--?	-	0	--?	--?	0	-	+	--?/+	0	0	0	0
TGSG42	--?	--	--?	-	--?	-	0	--?	--?	0	-	-?/+	+	0	0	0	0
TGSG43	--?	--	--?	--?	--?	+?	0	--?	--?	0	+?	+	+	0	0	0	0
TGSG44	--?	--	--?	--?	--?	+?	0	--?	--?	0	+?	+	+	0	0	0	0
TGSG45	--?	--	--?	-	--?	-	0	--?	--?	0	-	+	+	0	0	0	0
TGSG46	--?	--	--?	--?	--	+?	0	--?	--	0	+?	+	+	0	0	0	0
TGSG47	--?	--	--?	-	0	-	0	--?	--	0	-	+	--?/+	0	0	0	0
TGSG48	--?	--	--?	-	0	-	0	0	--	0	-	+	--?/+	0	0	0	0
TGSG49	--?	--	--?	--?	0	-	0	-?	--	0	-	+	+	0	0	0	0
TGSG50	--?	--	0?	-	-	-	0	--?	--	0	-	+	+	0	0	0	0
TGSG51	--?	--	-?	-	--?	-	0	-?	--	0	-	+	+	0	0	0	0
TGSG52	--?	--	-?	-	--?	-	0	-?	--	0	-	+	--?/+	0	0	0	0
TGSG53	--?	--	--?	-	--?	+?	0	--?	--	0	+?	+	+	0	0	0	0
TGSG54	--?	--	--?	--?	--	-	0	--?	-	0	-	+	--?/+	0	0	0	0
TGSG55	--?	--	--?	-	0	-	0	--?	--	0	-	+	+	0	0	0	0
TGSG56	--?	--	--?	-	0	-	0	--?	--	0	-	+	+	0	0	0	0

AoS Ref	SA1: Landscape	SA2: Biodiversity and geodiversity	SA3: Cultural heritage, architecture and archaeology	SA4: Material assets	SA5: Natural Resources	SA6: Climate change and energy	SA7: Flooding	SA8: Access to services	SA9: Health and amenity	SA10: Waste	SA11: Traffic and transport	SA12: Growth with prosperity for all	SA13: Provision of housing	SA14: Participation by all	SA15: Technology, innovation and inward investment	SA16: Population (skills and education)	SA17: Population (crime & fear of crime)
TGSG57	-?	--	--?	-	--?	+?	0	0	0	0	+?	+	+	0	0	0	0
TGSG58	--?	--	--?	-	--?	+?	0	--?	--?	0	+?	+	+	0	0	0	0
TGSG59	--?	--	--?	-	-	-	0	0	0	0	-	+	+	0	0	0	0
TGSG60	--?	--	--?	--?	0	-	0	--?	--?	-	-	+	+	0	0	0	0
TGSG61	--?	--	--?	-?	0	+?	0	--?	--	0	+?	+	+	0	0	0	0
TGSG62	--?	--	--?	-?	--?	+?	0	--?	--?	0	+?	+	+	0	0	0	0
TGSG63	--?	--	--?	-?	--?	-	0	--?	--?	0	-	+	+	0	0	0	0
TGSG64	--?	--	--?	--?	--?	-	0	-?	--?	0	-	+	+	0	0	0	0
TGSG65	-?	--	-?	-	--?	-	0	-?	--?	0	-	+	+	0	0	0	0
TGSG66	--?	--	--?	--?	--?	+?	0	--?	--?	0	+?	+	--?/+	0	0	0	0
TGSG67	-?	--	--?	-?	-?	-	0	--?	--?	0	-	+	+	0	0	0	0
TGSG68	-?	--	--?	-?	--?	+?	0	0	0	0	+?	+	+	0	0	0	0
TGSG69	--?	--	--?	-?	--	+?	0	--?	--?	0	+?	+	-?/+	0	0	0	0
TGSG70	--?	--	--?	-	--?	+?	0	--?	--?	0	+?	+	--?/+	0	0	0	0

SA Objective 1: Landscape

6.28 The vast majority of the areas of search are expected to have a significant negative effect with uncertainty in relation to SA objective 1. This is because the majority of the areas of search are adjacent to, or contain, a number of sensitive receptors, often including Public Rights of Way, outdoor recreation facilities and residential areas. A few of the areas of search are adjacent to the Cotswolds AONB. In addition, the landscape characteristics of the areas of search are often incompatible with potential mineral development. The potential effects are uncertain as the impacts depend where mineral extraction occurs in the area.

6.29 There are nine areas of search which are expected to lead to a minor negative effect with uncertainty in relation to SA objective 1. These areas of search tend to be situated within 1.5km of an AONB and are not situated within close proximity to any sensitive receptors. All effects are uncertain as the impacts depend where mineral extraction occurs across the area of search.

SA Objective 2: Biodiversity and Geodiversity

6.30 All of the areas of search are expected to have a significant negative effect in relation to SA2: Biodiversity and Geodiversity, because they each contain, are adjacent to, or are located within 1.5km of nationally designated biodiversity and/or geodiversity sites, which could be damaged or degraded by minerals development.

SA Objective 3: Cultural Heritage, Architecture and Archaeology

6.31 The majority (81%) of terrace and glacial sand and gravel areas of search scored significant negative effect with uncertainty in relation to SA objective 3. This is due to them containing, or lying adjacent to, national historic environment sites. A number of areas of search also scored significant negative effects with uncertainty due to the potential for inter-visibility and other disturbance to heritage assets within proximity to minerals workings. All effects are considered to be uncertain due to the potential for minerals extraction to take place in a number of locations within the area of search, some of which may not affect heritage assets.

6.32 Six of the terrace and glacial sand and gravel areas of search (TGSG5, TGSG19, TGSG20, TGSG51, TGSG52 and TGSG65) are likely to have minor negative effects with uncertainty in relation to SA Objective 3. In these instances, the areas of search are assessed as lying adjacent to a Conservation Area or within 1.5km of a locally important historic park or garden, which could be harmed as a result of minerals extraction.

6.33 Negligible or no impact in relation to SA Objective 3 is likely for seven of the terrace and glacial sand and gravel areas of search. In these cases, these effects have been predicted as a result of the area of search being located away from any national historic environment sites, Conservation Areas or locally important historic parks and gardens and with no or little intervisibility between the area and any heritage assets.

6.34 It is acknowledged that undiscovered archaeological remains could be present at any site and could be revealed, or damaged, by minerals development.

SA Objective 4: Material Assets

6.35 Eleven of the areas of search are expected to have a significant negative effect in relation to SA Objective 4, as they are situated on areas of Grade 1 agricultural land.

6.36 The vast majority of areas of search are expected to have minor negative effects in relation SA Objective 4 as they are situated on Green Belt land.

6.37 The other areas of search are expected to have a minor negative uncertain effect in relation to SA objective 4 because they consist of Grade 3 agricultural land and it is uncertain whether this is Grade 3a or Grade 3b.

SA Objective 5: Natural Resources

6.38 The majority of areas of search are expected to have a significant negative effect with uncertainty in relation to SA Objective 5. This is due to a majority of areas containing or being located adjacent to a water body and/or sensitive receptors. In addition, they are also likely to be within a Source Protection Zone and could have a potential impact on a nearby AQMA. Some potential effects are uncertain as the impacts on natural resources depend upon where mineral extraction occurs in the area of search.

6.39 Twelve of the areas are expected to have a minor negative effect as they are within Source Protection Zone 3 and are not within close proximity to a waterbody and/or any sensitive receptors.

SA Objective 6: Climate Change and Energy

6.40 The majority of the areas of search are expected to have a minor negative effect in relation to SA6: Climate Change and Energy, because they do not contain or lie adjacent to more sustainable means of transport, namely suitable water links.

6.41 The rest of the areas of search are expected to have a minor positive effect with uncertainty in relation to SA6: Climate Change and Energy because the areas contain, or are adjacent to, more sustainable means of transport, particularly water links. However, this is uncertain, as it will depend on loading/unloading facilities and route availability between source and destination.

SA Objective 7: Flooding

6.42 All of the areas of search are expected to have a negligible effect on SA7: Flooding, because sand and gravel extraction is considered compatible in any flood zone, although minerals development could have some minimal implications for flood risk.

SA Objective 8: Access to Services

6.43 Significant negative effects with uncertainty are likely for the majority (74%) of terrace and glacial sand and gravel areas of search in relation to SA objective 8. This is due to areas of search containing one or multiple Public Rights of Way. Minerals extraction could lead to severance or diversion of these, which may compromise the ability of people to access health, educational and other key local services in nearby settlements. In the case of some areas of search, it was also considered that minerals extraction could create a physical barrier to people accessing nearby local services. All effects are uncertain due to the exact scale and location of minerals extraction within the area of search being unknown.

6.44 Minor negative effects with uncertainty are likely for 10 of the terrace and glacial sand and gravel areas of search in relation to SA objective 8. These areas of search are located adjacent to Public Rights of Way, therefore minerals development could lead to the ability of people to access local services being compromised.

6.45 Eight of the terrace and glacial sand and gravel areas of search are scored as likely to have no impact in relation to SA Objective 8 due to them being located a sufficient distance from any Public Rights of Way, and not likely to create a physical barrier to people accessing key local services.

SA Objective 9: Health and Amenity

6.46 The vast majority of areas of search are expected to have a significant negative effect with uncertainty in relation to SA objective 9. This is because the areas of search are within 100m of sensitive receptors, including schools, residential areas and outdoor recreation facilities, which could be impacted by dust, noise and other disturbance from minerals development. The potential effects are uncertain as the impacts on health and amenity depend upon where mineral extraction occurs in the area.

6.47 In addition, ten of the areas of search are expected to have a minor negative effect as the areas of search are within 100m of less sensitive receptors, such as industrial areas and transport corridors. Six of the areas are expected to lead to no effect as they are not located within 100m of any sensitive or less sensitive receptors.

SA Objective 10: Waste

6.48 The majority of the areas of search are expected to have no effect on SA10: Waste because, they are not within 250m of existing waste infrastructure.

6.49 Nine areas of search are expected to have a minor negative effect on SA10 because they either contain or are located within 250m of one or more waste sites.

SA Objective 11: Traffic and Transport

6.50 The majority of the areas of search are expected to have a minor negative effect in relation to SA11: Traffic and Transport because they will likely require road-based movement by HGVs because there are no sustainable means of transport within or adjacent to the area.

6.51 The rest of the areas of search are expected to have a minor positive effect with uncertainty in relation to SA11: Traffic and Transport because there is potential for sustainable means of transport since each area contains or is adjacent to a potentially suitable water link. However, this is uncertain, as it will depend on loading/unloading facilities and route availability between source and destination.

SA Objective 12: Growth with Prosperity for All

6.52 Minor positive effects are likely for the vast majority (99%) of terrace and glacial sand and gravel areas of search in relation to SA Objective 12. This is due to them being located over 250m from any areas allocated for employment development or proposed infrastructure delivery and any new minerals extraction in the area providing new employment opportunities.

6.53 A mixed minor negative effect with uncertainty and minor positive effect is likely for only one of the terrace and glacial sand and gravel areas of search (TGSG42) in relation to SA Objective 12. In this case, the area of search is located within 250m of an area allocated for employment development, but minerals development within the area of search would still provide new employment opportunities. The minor negative is uncertain due to the exact scale and location of minerals extraction within the area of search being unknown.

SA Objective 13: Provision of Housing

6.54 The majority (77%) of terrace and glacial sand and gravel areas of search are considered likely to have a minor positive effect in relation to SA Objective 13. This is due to them being located over 250m from any areas allocated for the provision of housing[18] and them being worked for sand and gravel which is used in housing construction.

6.55 Mixed minor negative and minor positive effects are likely for two of the areas of search (TGSG40 and TGSG69) due to them being situated within 250m of an area allocated for the provision of housing. Uncertainty is present in the minor negative score due to the exact scale and location of minerals development within the area of search being unknown.

6.56 The remaining 14 areas of search were assessed as having mixed significant negative uncertain and minor positive effects, as they are located adjacent to one or more areas allocated for the provision of housing.

[18] These were identified using point data for housing and employment sites allocated through District Local Plans, sent to LUC by WCC. Allocations in the emerging Wyre Forest Local Plan Review have also been considered.

SA Objective 14: Participation by All

6.57 All of the areas of search are expected to have no effect in relation to SA14: Participation by All, because the locations of the areas will not affect the ability of communities to participate in decisions regarding minerals development.

SA Objective 15: Technology, Innovation and Inward Investment

6.58 All of the areas of search are expected to have no effect in relation to SA15: Technology, Innovation and Inward Investment, because the areas will not affect new technologies and innovation.

SA Objective 16: Population (skills and education)

6.59 All of the areas of search are expected to have no effect in relation to SA16: Population (skills and education), because the location of the areas will not affect skills and education.

SA Objective 17: Population (crime & fear of crime)

6.60 All of the areas are expected to have no effect in relation to SA17: Population (crime & fear of crime), because they will not affect crime and the fear of crime.

Silica Sand Areas of Search

Table 6.3: SA scores for silica sand areas of search[19]

AoS Ref	SA1:Landscape	SA2: Biodiversity and geodiversity	SA3: Cultural heritage, architecture and archaeology	SA4: Material Assets	SA5: Natural Resources	SA6: Climate change and energy	SA7: Flooding	SA8: Access to services	SA9: Health and amenity	SA10: Waste	SA11: Traffic and transport	SA12: Growth with prosperity for all	SA13: Provision of housing	SA14: Participation by all	SA15: Technology, innovation and inward investment	SA16: Population (skills and education)	SA17: Population (crime & fear of crime)
WFSS1	-?	--	--?	-	--	-	0	--?	-	0	-	+	0	0	0	0	0
WFSS2	-?	--	--?	-	-	-	0	--?	--	0	-	+	0	0	0	0	0
WFSS3	--?	--	--?	-	--	+?	0	--?	--?	-	+?	+	--?	0	0	0	0
WFSS4	--?	--	--?	-	--?	+?	0	--?	--	-	+?	+	--?	0	0	0	0
WFSS5	-?	--	0?	-	--	-	0	-?	--?	0	-	+	0	0	0	0	0
WFSS6	--?	--	-?	-	--	+?	0	-?	--?	-	+?	+	0	0	0	0	0
WFSS7	--?	--	--?	-	--?	+?	0	--?	--?	-	+?	--?/+	--?	0	0	0	0
WFSS8	--?	--	--?	0	--?	-	0	-?	--	0	-	+	-?	0	0	0	0
WFSS9	--	--	-?	0	--	+?	0	0	--	0	+?	+	--?	0	0	0	0
WFSS10	--	--	-?	-?	--	+?	0	0	--	0	+?	+	0	0	0	0	0
WFSS11	--?	--	-?	-?	--	+?	0	--?	--	0	+?	+	0	0	0	0	0

[19] Note that areas of search WFSS5, WFSS6, WFSS8, WFSS9 and WFSS10 have the same boundaries as areas of search SSSG4, SSSG5, SSSG13, SSSG14 and SSSG15 respectively, therefore the assessments for both are identical, except with regards to SA13 (as sand and gravel is used in housing construction, whereas silica sand is not).

AoS Ref	SA1:Landscape	SA2: Biodiversity and geodiversity	SA3: Cultural heritage, architecture and archaeology	SA4: Material Assets	SA5: Natural Resources	SA6: Climate change and energy	SA7: Flooding	SA8: Access to services	SA9: Health and amenity	SA10: Waste	SA11: Traffic and transport	SA12: Growth with prosperity for all	SA13: Provision of housing	SA14: Participation by all	SA15: Technology, innovation and inward investment	SA16: Population (skills and education)	SA17: Population (crime & fear of crime)
WFSS12	--	--	-?	0	--?	-	0	0	--	0	-	+	0	0	0	0	0
WFSS13	--	--	-?	-?	--?	--	0	0	--	0	-	+	0	0	0	0	0
WFSS14	--?	--	--?	-	--?	+?	0	--?	--?	0	+?	--?/+	--?	0	0	0	0
WFSS15	--	--	-?	-	--?	-	0	0	--	0	-	+	0	0	0	0	0
WFSS16	-?	--	0?	-	--?	--	0	0	0	0	-	+	0	0	0	0	0
WFSS17	-?	--	--?	-	--?	--	0	0	0	0	-	+	0	0	0	0	0
WFSS18	--?	--	--?	-	--?	-	0	--?	--?	0	-	+	--?	0	0	0	0
WFSS19	--?	-	--?	-	-?	-	0	--?	--?	0	-	+	0	0	0	0	0
WFSS20	-?	--	--?	-	-	-	0	-?	-?	0	-	+	0	0	0	0	0
WFSS21	-?	--	--?	-	-	-	0	--?	-?	0	-	+	0	0	0	0	0
WFSS22	--?	--	--?	-	--?	-	0	--?	--?	-	-	+	-?	0	0	0	0
WFSS23	--?	--	0?	-	--?	-	0	--?	--?	-	-	+	-?	0	0	0	0
WFSS24	-?	-	0?	-	-	-	0	0	0	-	-	+	0	0	0	0	0
WFSS25	--	-	0?	-	--?	-	0	0	--	0	-	+	--?	0	0	0	0
WFSS26	--?	-	--?	-	--?	-	0	--?	--?	-	-	+	0	0	0	0	0
WFSS27	--?	-	0	-	--?	-	0	--?	--	0	-	+	0	0	0	0	0
WFSS28	--?	--	0?	-	--?	-	0	--?	--?	0	-	+	0	0	0	0	0
WFSS29	--?	--	0?	-	--?	-	0	-?	--?	0	-	+	0	0	0	0	0

AoS Ref	SA1:Landscape	SA2: Biodiversity and geodiversity	SA3: Cultural heritage, architecture and archaeology	SA4: Material Assets	SA5: Natural Resources	SA6: Climate change and energy	SA7: Flooding	SA8: Access to services	SA9: Health and amenity	SA10: Waste	SA11: Traffic and transport	SA12: Growth with prosperity for all	SA13: Provision of housing	SA14: Participation by all	SA15: Technology, innovation and inward investment	SA16: Population (skills and education)	SA17: Population (crime & fear of crime)
WFSS30	-?	-	0?	-	--?	-	0	--?	--?	0	-	+	0	0	0	0	0
WFSS31	--?	--	0?	-	--?	-	0	--?	--?	0	-	+	0	0	0	0	0
WFSS32	--?	--	0?	-	--?	-	0	--?	--?	0	-	+	0	0	0	0	0
WFSS33	--?	--	--?	-	--?	-	0	--?	--?	0	-	+	0	0	0	0	0
WFSS34	0?	--	0?	-	-	-	0	0	0	0	-	+	0	0	0	0	0
WFSS35	--?	--	--?	-	--	-	0	-?	--	0	-	+	0	0	0	0	0
WFSS36	--?	--	--?	-	--?	-	0	0	--	0	-	+	0	0	0	0	0
WFSS37	-?	--	--?	-	-?	-	0	--?	--?	0	-	+	0	0	0	0	0
WFSS38	-?	--	--?	-	-?	-	0	--?	--?	0	-	+	0	0	0	0	0
WFSS39	--?	--	--?	-	--?	-	0	--?	--?	0	-	+	0	0	0	0	0
WFSS40	--?	--	--?	-	-?	-	0	0	-?	0	-	+	0	0	0	0	0
WFSS41	--?	--	--?	-	--?	-	0	--?	--?	0	-	+	0	0	0	0	0

SA Objective 1: Landscape

6.61 The majority of the silica sand areas of search are expected to have a significant negative effect with uncertainty in relation to SA Objective 1: Landscape. This is because the areas of search are adjacent to an AONB or a number of sensitive receptors, which could be visually impacted by a potential mineral development. In addition, for many areas of search the landscape characteristics could be incompatible with potential mineral development. The potential effects are uncertain as the impacts depend where mineral extraction occurs in the area.

6.62 There are eleven areas of search which are expected to lead to a minor negative effect with uncertainty, as these areas of search are situated within 1.5km of an AONB but are not situated within close proximity of any sensitive receptors. The potential effects are uncertain as the impacts depend upon where mineral extraction occurs in the area.

SA Objective 2: Biodiversity and Geodiversity

6.63 The majority of areas of search are expected to have a significant negative effect in relation to SA2: Biodiversity and Geodiversity, because they each contain or are within 1.5km of a SSSI.

6.64 The remaining areas of search are expected to have minor negative effects as they are situated within 1.5km of a local wildlife or geological site.

SA Objective 3: Cultural Heritage, Architecture and Archaeology

6.65 Significant negative effects with uncertainty are likely for 22 out of the 41 silica sand areas of search in relation to SA Objective 3. This score has been given due to these areas of search containing or lying adjacent to national historic environment sites, which could potentially be compromised by minerals extraction in the area. Instances where inter-visibility or other disturbance is likely to compromise heritage assets located within proximity of minerals development have also been scored as likely to have significant negative effects with uncertainty. All effects are uncertain due to the exact scale or location of minerals extraction within the areas of search being unknown.

6.66 Minor negative effects with uncertainty are likely for seven of the silica sand areas of search in relation to SA Objective 3, due to them being located adjacent to a Conservation Area or within 1.5km of a locally important park and garden. Minerals extraction could potentially compromise these heritage assets depending on the scale and location of minerals extraction.

6.67 Twelve of the silica sand areas of search are considered likely to have negligible or no impact in relation to SA Objective 3. In these cases, the areas of search are considered to be at sufficient distance from heritage assets and have no or very limited potential for inter-visibility or other disturbance to heritage assets.

SA Objective 4: Material Assets

6.68 The majority of the areas of search are expected to have a minor negative effect in relation to SA objective 4, because they lie entirely within the Green Belt.

6.69 Three of the areas of search are expected to have minor negative uncertain effects in relation to SA Objective 4, as they consist of Grade 3 agricultural land and it is uncertain whether it is Grade 3a or Grade 3b.

6.70 The remaining areas of search are expected to have no effects as they lie outside of the green belt and do not contain valuable agricultural land.

SA Objective 5: Natural Resources

6.71 The vast majority of areas of search are expected to have a significant negative effect with uncertainty in relation to SA Objective 5, because the majority of areas contain or are located adjacent to a water body and/or sensitive receptors. In addition, many areas of search contain

areas within a Source Protection Zone and are likely to have an impact on a nearby AQMA. The potential effects are uncertain as the impacts depend upon where mineral extraction occurs in the area.

6.72 A number of areas of search are expected to have a minor negative effect as they are located within Source Protection Zone 2 or 3 and are not within close proximity to a waterbody and/or any sensitive receptors.

SA Objective 6: Climate Change and Energy

6.73 The majority of the areas of search are expected to have a minor negative effect in relation to SA6: Climate Change and Energy, because they do not fall within or adjacent to more sustainable means of transport, namely suitable water links.

6.74 Eight of the areas of search are expected to have a minor positive effect with uncertainty in relation to SA6, because the areas contain or are adjacent to more sustainable means of transport, namely water links. However, this is uncertain, as it will depend on loading/unloading facilities and route availability between source and destination.

6.75 Three areas of search are expected to have a significant negative effect in relation to SA6, because minerals development in the area is expected to include large areas of woodland, so it is likely that there will be a net loss of significant tree cover and they do not fall within or adjacent to more sustainable means of transport.

SA Objective 7: Flooding

6.76 All of the areas of search are expected to have a negligible effect on SA7: Flooding, because silica sand extraction is considered compatible in any flood zone, although minerals development (and associated infrastructure) may have some, limited effects on flood risk.

SA Objective 8: Access to Services

6.77 For SA Objective 8, 56% of the silica sand areas of search are scored as likely to have significant negative effects with uncertainty. This is due to them containing one or multiple Public Rights of Way which could be diverted or severed during minerals extraction, limiting the ability of people to access health, educational or other key local services in nearby settlements. For some silica sand areas of search, significant negative effects with uncertainty are also predicted due to the potential for minerals extraction to create a physical barrier to local services. All scores are uncertain due to the exact scale and location of minerals extraction within the area of search being unknown.

6.78 Minor negative effects with uncertainty are likely for six of the silica sand areas of search in relation to SA Objective 8. In these cases, areas of search are located adjacent to a Public Right of Way, therefore minerals development could compromise access to local services.

6.79 The remaining areas of search are assessed as having no impact in relation to SA Objective 8, due to them not containing or lying adjacent to any Public Rights of Way and not creating a barrier to local services.

SA Objective 9: Health and Amenity

6.80 The vast majority of areas of search are expected to have a significant negative effect with uncertainty in relation to SA objective 9. This is because these areas of search are within 100m of sensitive receptors, including schools, residential areas and outdoor recreation facilities, which could be impacted by dust, noise and emissions from minerals development. In addition, several of the areas of search are expected to have no effect or a minor effect as the areas of search are either within 100m of less sensitive receptors, such as industrial areas and transport corridors, or there are no adjacent sensitive receptors.

SA Objective 10: Waste

6.81 The majority of areas of search are expected to have no effect in relation to SA10: Waste, because they are not located within 250m of existing waste infrastructure.

6.82 Eight areas of search are expected to have a minor negative effect in relation to SA10, because they either contain or are located within 250m of one or more waste sites.

SA Objective 11: Traffic and Transport

6.83 The majority of the areas of search are expected to have a minor negative effect on SA11: Traffic and Transport, because they will likely require road-based movement by HGVs because there are no sustainable means of transport within or adjacent to the area.

6.84 The rest of the areas of search are expected to have a minor positive effect with uncertainty on SA11, because there is potential for sustainable means of transport since each area contains or is adjacent to a potentially suitable water link. However, this is uncertain, as it will depend on loading/unloading facilities and route availability between source and destination.

SA Objective 12: Growth with Prosperity for All

6.85 For SA Objective 12, all but two silica sand areas of search are scored as likely to have a minor positive effect, due to them being located over 250m from any areas allocated for employment development or proposed infrastructure delivery and any new minerals extraction in the area being likely to provide new employment opportunities.

6.86 The remaining areas of search are expected to have mixed uncertain significant negative and minor positive effects as they contain an area proposed for mixed development.

SA Objective 13: Provision of Housing

6.87 The majority of silica sand areas of search are likely to have no impact on SA Objective 13. This is due to them being located over 250m from any areas allocated for the provision of housing.

6.88 Three silica sand areas of search are assessed as likely to have a minor negative effect with uncertainty due to them being located within 250m of an area allocated for the provision of housing. Uncertainty is present in these scores due to the exact scale and location of minerals development within the area of search being unknown.

6.89 The remaining seven silica sand areas of search were assessed as likely to have significant negative effects with uncertainty due to them being situated adjacent to or containing an area allocated for the provision of housing.

SA Objective 14: Participation by All

6.90 All of the areas of search are expected to have no effect in relation to SA14: Participation by All, because the locations of the areas will not affect the ability of communities to participate in decisions regarding minerals development.

SA Objective 15: Technology, Innovation and Inward Investment

6.91 All of the areas of search are expected to have no effect in relation to SA15: Technology, Innovation and Inward Investment, because the areas will not affect new technologies and innovation.

SA Objective 16: Population (skills and education)

6.92 All of the areas of search are expected to have no effect in relation to SA16: Population (skills and education), because the location of the areas will not affect skills and education.

SA Objective 17: Population (crime & fear of crime)

6.93 All of the areas are expected to have no effect in relation to SA17: Population (crime & fear of crime), because they will not affect crime and the fear of crime.

Solid Sand and Gravel Areas of Search

Table 6.4: SA scores for solid sand and gravel areas of search[20]

AoS Ref	SA1: Landscape	SA2: Biodiversity and geodiversity	SA3: Cultural heritage, architecture and archaeology	SA4: Material assets	SA5: Natural resources	SA6: Climate change and energy	SA7: Flooding	SA8: Access to services	SA9: Health and amenity	SA10: Waste	SA11: Traffic and transport	SA12: Growth with prosperity for all	SA13: Provision of housing	SA14: Participation by all	SA15: Technology, innovation and inward investment	SA16: Population (skills and education)	SA17: Population (crime & fear of crime)
SSSG1	--?	--	--?	-	--	+?	0	--?	--	-	+?	+	--?/+	0	0	0	0
SSSG2	--?	--	--?	-	--?	+?	0	--?	--?	-	+?	+/--	--?/+	0	0	0	0
SSSG3	--?	--	--?	-	--	+?	0	--?	--?	-	+?	+	-?/+	0	0	0	0
SSSG4	-?	--	0?	-	--	-	0	-?	--?	0	-	+	+	0	0	0	0
SSSG5	--?	--	-?	-	--	+?	0	-?	--?	-	+?	+	+	0	0	0	0
SSSG6	--?	--	0?	-	--?	-	0	0	--	0	-	+	+	0	0	0	0
SSSG7	--?	--	--?	-	--?	+?	0	--?	--?	0	+?	+	+	0	0	0	0
SSSG8	--?	--	0	0	--	-	0	0	--	0	-	+	+	0	0	0	0
SSSG9	-?	--	0?	-	--?	-	0	-?	-?	0	-	+	+	0	0	0	0
SSSG10	--?	--	--?	-	--	+?	0	--?	--?	0	+?	+	+	0	0	0	0
SSSG11	-?	--	--?	-	--?	+?	0	--?	-?	0	+?	+	+	0	0	0	0

[20] Note that areas of search SSSG4, SSSG5, SSSG13, SSSG14 and SSSG15 have the same boundaries as areas for search WFSS5, WFSS6, WFSS8, WFSS9 and WFSS10 respectively, therefore the assessments for both are identical, except with regards to SA13 (as sand and gravel is used in housing construction, whereas silica sand is not).

AoS Ref	SA1: Landscape	SA2: Biodiversity and geodiversity	SA3: Cultural heritage, architecture and archaeology	SA4: Material assets	SA5: Natural resources	SA6: Climate change and energy	SA7: Flooding	SA8: Access to services	SA9: Health and amenity	SA10: Waste	SA11: Traffic and transport	SA12: Growth with prosperity for all	SA13: Provision of housing	SA14: Participation by all	SA15: Technology, innovation and inward investment	SA16: Population (skills and education)	SA17: Population (crime & fear of crime)
SSSG12	--?	--	--?	-	--?	-	0	--?	--?	0	-	+	+	0	0	0	0
SSSG13	--?	--	--?	0	--?	-	0	-?	--	0	-	+	-?/+	0	0	0	0
SSSG14	--	--	-?	0	--	+?	0	0	--	0	+?	+	--?/+	0	0	0	0
SSSG15	--	--	-?	-?	--	+?	0	0	--	0	+?	+	+	0	0	0	0
SSSG16	--?	--	0?	-	--?	-	0	-?	--	0	-	+	+	0	0	0	0
SSSG17	--?	--	--?	-	--	+?	0	--?	--?	0	+?	+	--?/+	0	0	0	0
SSSG18	--?	--	--?	-	--	+?	0	--?	--?	0	+?	+	+	0	0	0	0
SSSG19	-?	--	--?	-	-	-	0	--?	--?	0	-	+	+	0	0	0	0
SSSG20	-?	--	--?	-	--?	-	0	--?	--?	0	-	+	+	0	0	0	0
SSSG21	--?	--	--?	-	--	-	0	--?	--?	-	-	+	-?/+	0	0	0	0
SSSG22	--?	--	0?	-	--	+?	0	-?	--	0	+?	+	--?/+	0	0	0	0
SSSG23	--?	--	--?	-	--?	+?	0	--?	--?	-	+?	+	+	0	0	0	0
SSSG24	--?	--	0	-	--?	-	0	0	--	0	-	+	+	0	0	0	0
SSSG25	--?	--	-?	-	--?	-	0	-?	--?	0	-	+	+	0	0	0	0
SSSG26	--?	--	0?	-	--?	-	0	--?	--?	0	-	+	+	0	0	0	0
SSSG27	--?	--	--?	-	--	+?	0	--?	--	0	+?	+	+	0	0	0	0
SSSG28	--?	--	--?	-	--?	-	0	--?	--?	0	-	+	+	0	0	0	0
SSSG29	--?	--	--?	-	--?	-	0	--?	--?	0	-	+	+	0	0	0	0

AoS Ref	SA1: Landscape	SA2: Biodiversity and geodiversity	SA3: Cultural heritage, architecture and archaeology	SA4: Material assets	SA5: Natural resources	SA6: Climate change and energy	SA7: Flooding	SA8: Access to services	SA9: Health and amenity	SA10: Waste	SA11: Traffic and transport	SA12: Growth with prosperity for all	SA13: Provision of housing	SA14: Participation by all	SA15: Technology, innovation and inward investment	SA16: Population (skills and education)	SA17: Population (crime & fear of crime)
SSSG30	--?	--	--?	-	-	-	0	--?	--?	0	-	+	+	0	0	0	0

SA Objective 1: Landscape

6.94 The majority of the areas of search are expected to have a significant negative effect with uncertainty in relation to SA Objective 1: Landscape. This is because they either contain or lie adjacent to an AONB or a number of sensitive receptors, which could be visually impacted by a potential mineral development. In addition the landscape characteristics of the area of search could be incompatible with potential mineral development. The potential effects are uncertain as the impacts depend upon where mineral extraction occurs in the area.

6.95 There are four areas of search which are expected to lead to a minor negative effect with uncertainty in relation to SA objective 1. These areas of search tend to be situated within 1.5km of an AONB but are not situated within close proximity of many sensitive receptors. The potential effects are uncertain as the impacts depend upon where mineral extraction occurs in the area.

SA Objective 2: Biodiversity and Geodiversity

6.96 All of the areas of search are expected to have a significant negative effect in relation to SA2: Biodiversity and Geodiversity, because they each are in close proximity to one or more SSSIs. Additionally, each area is within 1.5km of locally designated biodiversity and/or geodiversity sites, which could be damaged or degraded by minerals development.

SA Objective 3: Cultural Heritage, Architecture and Archaeology

6.97 For the majority (60%) of the solid sand and gravel areas of search, a significant negative effect with uncertainty score has been predicted in relation to SA Objective 3. This is due to these areas of search containing or being located adjacent to national historic environment assets, which could potentially be compromised as a result of minerals development. In cases where there are heritage assets within proximity of an area search and there could be inter-visibility with or other disturbance from minerals development, a significant negative score has also been recorded. All scores are uncertain due to the exact scale or location of minerals extraction within the areas of search being unknown.

6.98 Four solid sand and gravel areas of search (SSSG5, SSSG14, SSSG15 and SSSG25) are assessed as being likely to have a minor negative effect with uncertainty in relation to SA Objective 3 due to their location adjacent to a Conservation Area.

6.99 The remaining areas of search are likely to have negligible or no impact in relation to SA Objective 3 due to their distance from heritage assets and because they have very limited potential for inter-visibility or other disturbance to heritage assets.

SA Objective 4: Material Assets

6.100 The majority of the areas of search are expected to have a minor negative effect in relation to SA objective 4, because they lie entirely within the Green Belt and/or consist of Grade 2 agricultural land. One area of search has a minor negative score with uncertainty, as it is unclear if it is within Grade 3a or 3b agricultural land.

6.101 The remaining areas of search are expected to have no effects as they are not situated in the Green Belt or best and most versatile agricultural land.

SA Objective 5: Natural Resources

6.102 The vast majority of areas of search are expected to have a significant negative effect in relation to SA Objective 5, with some effects being uncertain. This is because the majority of areas contain or are located adjacent to a water body and/or sensitive receptors. In addition, many are also within a Source Protection Zone and could exacerbate air quality issues in a nearby AQMA. Some potential effects are uncertain as the impacts on natural resources depend upon where mineral extraction occurs in the area.

6.103 A number of areas of search are expected to have a minor negative effect as they are located within Source Protection Zones 2 or 3 but are not within close proximity of a waterbody and/or any sensitive receptors.

SA Objective 6: Climate Change and Energy

6.104 Fourteen of the areas of search are expected to have a minor positive effect with uncertainty on SA6: Climate Change and Energy, because the areas contain or are adjacent to more sustainable means of transport, such as a water link. However, this is uncertain, as it will depend on loading/unloading facilities and route availability between source and destination.

6.105 The rest of the areas of search are expected to have a minor negative effect on Climate Change and Energy because they do not fall within or adjacent to more sustainable means of transport, namely suitable water links.

SA Objective 7: Flooding

6.106 All of the areas of search are expected to have a negligible effect on SA7: Flooding, because solid sand and gravel extraction is considered compatible in any flood zone, although minerals development could have some minimal implications for flood risk.

SA Objective 8: Access to Services

6.107 For SA Objective 8, the majority (60%) of solid sand and gravel areas of search are scored as likely to have significant negative effects with uncertainty, due to them containing one or multiple Public Rights of Way which may be severed or diverted due to minerals development. This could reduce the ability of people to access health, educational or other key local services in nearby settlements and, in the case of larger areas of search, could even create a physical barrier to accessing services.

6.108 Minor negative effects with uncertainty are likely for seven of the solid sand and gravel areas of search, due to them being located adjacent to a Public Right of Way, therefore minerals development could compromise access to local services.

6.109 The remaining areas of search are assessed as likely to have no impact in relation to SA Objective 8. In these cases, the areas of search are considered to be a sufficient distance from Public Rights of Way to suggest access to services is unlikely to be compromised.

SA Objective 9: Health and Amenity

6.110 The majority of areas of search are expected to have a significant negative effect with uncertainty in relation to SA objective 9. This is because the areas of search are within 100m of sensitive receptors, including schools, residential areas and outdoor recreation facilities, which could be impacted by dust, noise and emissions from minerals development.

6.111 The remaining areas of search are expected to have a minor negative effect, as they are within 100m of less sensitive receptors, such as industrial areas and transport corridors.

SA Objective 10: Waste

6.112 The majority of areas of search are expected to have no effect in relation to SA10: Waste, because they are not located within 250m of existing waste infrastructure.

6.113 Six areas of search (SSSG1, SSSG2, SSSG3, SSSG5, SSSG21 and SSSG23) are expected to have a minor negative effect on SA10, because they either contain or are located within 250m of one or more waste sites.

SA Objective 11: Traffic and Transport

6.114 Fourteen of the areas of search are expected to have a minor positive effect with uncertainty on SA11: Traffic and Transport, because there is potential for sustainable means of transport since

each area contains or is adjacent to a river or canal link. However, this is uncertain, as it will depend on loading/unloading facilities and route availability between source and destination.

6.115 The rest of the areas of search are expected to have a minor negative effect on Traffic and Transport, because they will likely require road-based movement by HGVs because there are no water links within or adjacent to the area.

SA Objective 12: Growth with Prosperity for All

6.116 All but one solid sand and gravel areas of search are likely to have minor positive effects in relation to SA Objective 12. This is due to them being located over 250m from any areas allocated for employment development or proposed infrastructure delivery and that any new minerals extraction in the area is likely to produce new employment opportunities.

6.117 The remaining area of search (SSSG2) is expected to have uncertain significant negative effects and a minor positive due to it containing a proposed allocation for mixed development.

SA Objective 13: Provision of Housing

6.118 For SA Objective 13, all solid sand and gravel areas of search are assessed as being likely to have minor positive effects (some of these are mixed, as described below). This is because minerals development would be worked for sand and gravel which is used in housing construction. In addition, most areas of search are located over 250m from any areas allocated for the provision of housing.

6.119 However, five of the solid sand and gravel areas of search were also assessed as being likely to have significant negative with uncertainty along with minor positive effects due to them being situated adjacent to an area allocated for the provision of housing. One of these areas also contains an area proposed for mixed development. All effects are uncertain due to the exact scale or location of minerals extraction within the area of search being unknown.

6.120 In addition, three sites are also likely to have mixed negative along with minor positive effects due to them containing or being within 250m of an area allocated for the provision of housing. All effects are uncertain due to the exact scale or location of minerals extraction within the area of search being unknown.

SA Objective 14: Participation by All

6.121 All of the areas of search are expected to have no effect in relation to SA14: Participation by All, because the locations of the areas will not affect the ability of communities to participate in decisions regarding minerals development.

SA Objective 15: Technology, Innovation and Inward Investment

6.122 All of the areas of search are expected to have no effect in relation to SA15: Technology, Innovation and Inward Investment, because the areas will not affect new technologies and innovation.

SA Objective 16: Population (skills and education)

6.123 All of the areas of search are expected to have no effect in relation to SA16: Population (skills and education), because the location of the areas will not affect skills and education.

SA Objective 17: Population (crime & fear of crime)

6.124 All of the areas are expected to have no effect in relation to SA17: Population (crime & fear of crime), because they will not affect crime and the fear of crime.

Brick Clay Areas of Search

Table 6.5: SA scores for brick clay areas of search

AoS Ref	SA1: Landscape	SA2: Biodiversity and geodiversity	SA3: Cultural heritage, architecture and archaeology	SA4: Material assets	SA5: Natural Resources	SA6: Climate change and energy	SA7: Flooding	SA8: Access to Services	SA9: Health and amenity	SA10: Waste	SA11: Traffic and transport	SA12: Growth with prosperity for all	SA13: Provision of housing	SA14: Participation by all	SA15: Technology, innovation and inward investment	SA16: Population (skills and education)	SA17: Population (crime & fear of crime)
CLAY1	--?	--	--?	-	--	+?	-?	--?	0	0	+?	+	+	0	0	0	0
CLAY2	--?	--	--?	-	--	+?	-?	--?	--?	-	+?	--?/+	--?/+	0	0	0	0
CLAY3	--?	--	--?	-	--?	-	0	--?	--?	0	-	+	+	0	0	0	0
CLAY4	-?	--	--?	-	0	-	0	--?	0	0	-	+	+	0	0	0	0
CLAY5	--?	-	--?	-	--	+?	0	--?	--?	-	+?	+	--?/+	0	0	0	0
CLAY6	--?	--	--?	-	--?	+?	0	--?	--?	0	+?	+	+	0	0	0	0
CLAY7	--?	--	--?	--?	--	+?	-?	--?	--?	0	+?	+	--?/+	0	0	0	0
CLAY8	--?	--	--?	--?	--?	+?	-?	--?	--?	0	+?	+	+	0	0	0	0
CLAY9	--?	--	--?	--?	--?	+?	-?	--?	--?	0	+?	+	-?/+	0	0	0	0
CLAY10	--?	--	--?	--?	--	+?	-?	--?	--?	-	+?	+	--?/+	0	0	0	0
CLAY11	--?	--	--?	--?	--	+?	0	--?	--?	0	+?	+	--?/+	0	0	0	0
CLAY12	--?	--	--?	--?	--?	-	0	--?	--	0	-	+	--?/+	0	0	0	0
CLAY13	--?	--	--?	-	--?	+?	-?	--?	--?	0	+?	+	--?/+	0	0	0	0

SA Objective 1: Landscape

6.125 The majority of the areas of search are expected to have a significant negative effect with uncertainty in relation to SA Objective 1: Landscape. This is because they either include or lie adjacent to an AONB and/or a number of sensitive receptors. In addition there could be landscape characteristics of the area of search which are incompatible with potential mineral development. The potential effects are uncertain, as the impacts depend upon where mineral extraction occurs in the area.

6.126 CLAY4 is expected to lead to a minor negative effect with uncertainty in relation to SA objective 1, as this area of search is situated adjacent to a Public Right of Way. The potential effects are uncertain as the impacts depend upon where mineral extraction occurs in the area.

SA Objective 2: Biodiversity and Geodiversity

6.127 All but one of the areas of search are expected to have a significant negative effect in relation to SA2: Biodiversity and Geodiversity, because they each are in close proximity to one or more SSSIs. Additionally, each area is within 1.5km of locally designated biodiversity and/or geodiversity sites, which could be damaged or degraded by minerals development.

6.128 The remaining area of search is expected to have a minor negative effect due to it being located within 1.5km of a local wildlife or geology site.

SA Objective 3: Cultural Heritage, Architecture and Archaeology

6.129 All Brick Clay areas of search are likely to have significant negative effects with uncertainty in relation to SA Objective 3. This is due to all areas of search containing or being located adjacent to national historic environment assets, which could be compromised by minerals development. For a number of areas of search, significant negative effects are also expected due to potential inter-visibility or noise and dust disturbance with heritage assets located within proximity of the site. All effects are uncertain due to the exact scale or location of minerals development within the area of search being unknown.

SA Objective 4: Material Assets

6.130 Six of the areas of search are expected to have a significant negative effect in relation to SA objective 4, because they consist of Grade 1 agricultural land (at least in part).

6.131 The remaining areas of search are expected to have minor negative effects due to them being located within the Green Belt and/or consisting of Grade 2 and 3 agricultural land.

SA Objective 5: Natural Resources

6.132 The majority of areas of search are expected to have a significant negative effect in relation to SA Objective 5, although some of these are uncertain. This is because the majority of areas contain or are located adjacent to a water body and/or sensitive receptors. In addition, many areas of search are within a Source Protection Zone and could exacerbate air quality issues in a nearby AQMA. Some potential effects are uncertain as the impacts on natural resources depend where mineral extraction occurs in the area.

6.133 CLAY 4 is assessed as having no effects with regards to this SA objective, as this area of search is not within a Source Protection Zone and is not located in proximity to an AQMA or any sensitive receptors.

SA Objective 6: Climate Change and Energy

6.134 The majority of the areas of search are expected to have a minor positive effect with uncertainty in relation to SA6: Climate Change and Energy, because the areas contain or are adjacent to more sustainable means of transport, such as a water link. However, this is uncertain, as it will depend on loading/unloading facilities and route availability between source and destination.

6.135 Three areas of search are expected to have a minor negative effect in relation to SA6: Climate Change and Energy, because they do not contain or are not adjacent to more sustainable means of transport, namely suitable water links.

SA Objective 7: Flooding

6.136 The majority of the areas of search are expected to have a minor negative effect with uncertainty in relation to SA7: Flooding, because the areas are within flood zone 3, however, the effect will depend on where minerals are extracted from within the area.

6.137 The other areas of search are expected to have a negligible effect in relation to SA7: Flooding, because the areas are not within flood zone 3, although minerals development could have some minimal implications for flood risk.

SA Objective 8: Access to Services

6.138 For SA Objective 8, all brick clay areas of search are likely to produce significant negative effects with uncertainty. This is due to them containing multiple Public Rights of Way which are likely to be severed or diverted during minerals extraction, which would compromise the ability of people to access health, educational or other key local services in nearby settlements. Due to the location of a number of brick clay areas of search, it is considered likely that minerals development could potentially create a physical barrier to people accessing key local services. The exact scale or location of where minerals development will take place within areas of search is unknown which creates uncertainty across all scores.

SA Objective 9: Health and Amenity

6.139 The vast majority of areas of search are expected to have a significant negative effect with uncertainty in relation to SA objective 9. This is because the areas of search are within 100m of sensitive receptors, including schools, residential areas and outdoor recreation facilities, which could be impacted by dust, noise and emissions from a mineral development. The potential effects are uncertain as the impacts on health and amenity depend where mineral extraction occurs in the area.

6.140 CLAY1 and CLAY4 areas of search are expected to have no effect as the areas of search are not within 100m of any relevant receptors.

SA Objective 10: Waste

6.141 The majority of areas of search are expected to have no effect on SA10: Waste, because they are not located within 250m of existing waste infrastructure.

6.142 Three areas of search (CLAY2, CLAY5 and CLAY10) are expected to have a minor negative effect on SA10, because they either contain or lie within 250m of a waste site.

SA Objective 11: Traffic and Transport

6.143 The majority of the areas of search are expected to have a minor positive effect with uncertainty in relation to SA11: Traffic and Transport, because there is potential for sustainable means of transport since each area contains or is adjacent to a river or canal. However, this is uncertain, as it will depend on loading/unloading facilities and route availability between source and destination.

6.144 Three areas of search are expected to have a minor negative effect in relation to SA11: Traffic and Transport, because they will likely require road-based movement by HGVs because there are no sustainable means of transport within or adjacent to the area.

SA Objective 12: Growth with Prosperity for All

6.145 The vast majority (92%) of brick clay areas of search are likely to produce minor positive effects in relation to SA Objective 12. This is due to them being located over 250m from any areas

allocated for employment development or proposed infrastructure delivery and that any new minerals extraction in the area is likely to produce new employment opportunities.

6.146 The remaining brick clay area of search (CLAY2) is likely to have a significant negative effect with uncertainty and a minor positive effect in relation to SA Objective 12. This is due to this area of search being located adjacent to an area allocated for employment development. The uncertainty in the significant negative score is present due to the exact scale or location of minerals extraction within the area of search being unknown.

SA Objective 13: Provision of Housing

6.147 For SA Objective 13, five of the thirteen areas of search are likely to have minor positive effects. This is due to them being located over 250m from an area allocated for the provision of housing and they are being worked for brick clay, which is used in housing construction.

6.148 Seven of the brick clay areas of search were assessed as being likely to have significant negative with uncertainty and minor positive effects due to them being situated adjacent to an area allocated for the provision of housing. The uncertainty in the scores is due to the exact scale and location of minerals development within the area of search being unknown.

6.149 The remaining area of search (CLAY9) is likely to have mixed minor negative and minor positive effects in relation to SA objective 13. This is due to it being within 250m of an area allocated for the provision of housing.

SA Objective 14: Participation by All

6.150 All of the areas of search are expected to have no effect in relation to SA14: Participation by All, because the locations of the areas will not affect the ability of communities to participate in decisions regarding minerals development.

SA Objective 15: Technology, Innovation and Inward Investment

6.151 All of the areas of search are expected to have no effect in relation to SA15: Technology, Innovation and Inward Investment, because the areas will not affect new technologies and innovation.

SA Objective 16: Population (skills and education)

6.152 All of the areas of search are expected to have no effect in relation to SA16: Population (skills and education), because the location of the areas will not affect skills and education.

SA Objective 17: Population (crime & fear of crime)

6.153 All of the areas are expected to have no effect in relation to SA17: Population (crime & fear of crime), because they will not affect crime and the fear of crime.

7 Sustainability Appraisal Findings: Policies

7.1 This chapter describes the SA findings of the 32 policies proposed in the Worcestershire Minerals Local Plan Publication Version document (contained in chapters 4-7 inclusive). The findings are summarised below, grouped in line with the chapters of the MLP.

7.2 The SA matrices prepared for the policies are presented in **Appendix 5**. Where policies have a spatial element i.e. they refer to specific mineral strategic corridors, these have been appraised with reference to GIS data.

Chapter 4: Spatial Strategy (strategic policies)

7.3 **Table 7.1** summarises the SA scores for the eight policies in Chapter 4: Spatial Strategy, which show that a range of positive and negative effects have been identified for the Spatial Strategy policies.

7.4 The Spatial Strategy for the MLP is to encourage mineral development in Worcestershire to be located in the five strategic corridors covered by Policies MLP 4 to MLP 8. Throughout the Minerals Local Plan, mineral development sites are viewed as part of the wider green infrastructure network, before, during and after they are worked for their minerals, and this is set out in Policy MLP 3 (Green Infrastructure). The strategic corridors policies (Policies MLP 4 to MLP 8) set out the long-term priorities for green infrastructure which mineral development can and should help to address in each of the strategic corridors. Policy MLP 1 (Strategic Location of Development) sets the parameters for granting planning permission for minerals development within and (in certain limited circumstances) outside strategic corridors, while Policy MLP 2 (Borrow Pits) enables the working of borrow pits alongside nearby specific projects, and they therefore tend to be small-scale, short-term operations. While a number of potentially negative effects have been identified in relation to these policies as discussed below, it is recognised that other policies within the MLP, including development management Policies MLP 17 to MLP 30, provide mitigation for the effects identified, and this is set out in **Chapter 9** of this SA Report.

7.5 Given that Policy MLP 3 (Green Infrastructure) aims to deliver the multiple benefits of green infrastructure by protecting and enhancing the green infrastructure network throughout the life of minerals development, it is likely to have positive effects on more than half of the SA objectives, including significant positive effects in relation to SA objectives 1: Landscape, 2: Biodiversity and geodiversity, 3: Cultural heritage, architecture and archaeology, 5: Natural resources, 6: Climate change and energy and 7: Flooding. This is because Policy MLP 3 specifically requires mineral development applications to deliver multiple benefits of green infrastructure taking account of opportunities to protect and enhance landscape, ecological networks, geodiversity, heritage assets, surface water and groundwater resources, and to reduce the causes and impacts of flooding. Minor positive effects are likely for SA objectives 4: Material assets, 8: Access to services, 9: Health and amenity and 13: Provision of housing because protecting and enhancing the green infrastructure network will contribute to safeguarding open space and green infrastructure (SA objective 4), improve access to open space and the rights of way network (SA objective 8), and in turn benefit health, amenity and the local environment where housing may be delivered. Policy MLP 3 is not expected to have an effect on the remaining SA objectives.

7.6 The rest of the Spatial Strategy policies have more mixed effects with a number of minor positive effects identified, but often mixed with uncertain minor or significant negative effects. All of the policies except Policy MLP 3 could result in negative effects in relation to SA objectives 1: Landscape, 2: Biodiversity and geodiversity and 3: Cultural heritage, architecture and archaeology because minerals development could be permitted within close proximity of an AONB, nationally or locally important historic park and garden, SSSIs (and SSSI Impact Risk Zones), local geological sites and Local Wildlife Sites or Scheduled Monuments, Conservation Areas and Grade I, II* and II listed buildings. These effects are generally uncertain as they would be

dependent on the location and scale of any mineral sites coming forward within or outside of the strategic corridors, which are unknown at this stage. The effects are minor for Policy MLP 2 (Borrow Pits) because of the smaller-scale and short-term nature of these types of mineral workings. All of the negative effects identified for SA objectives 1, 2 and 3 are mixed with minor positive effects as all of the Spatial Strategy policies (except Policy MLP 3) include requirements for either maintaining or enhancing the green infrastructure network and/or taking a 'landscape-scale' approach to restoration of minerals sites, all of which could benefit landscape, biodiversity and geodiversity and cultural heritage assets.

7.7 Significant negative uncertain effects (not mixed with any positive effects) are identified for the strategic corridors identified through Policies MLP 6 to MLP 8 in relation to SA objective 4: Material assets, because they all contain Grade 1 agricultural land (with a mix of Grades 2, 3, 4 and urban land). The uncertain significant negative effect is mixed with a minor positive effect for the strategic corridors set out through Policies MLP 4 and MLP 5 as these policies include priorities to seek to restore characteristic arable, pastoral, cropping or horticultural land uses, which could help to ensure that the most versatile agricultural land is safeguarded, and for any agricultural land that has been used within the strategic corridor to be restored.

7.8 All of the Spatial Strategy policies (except Policy MLP 3) are also likely to have significant negative effects in relation to SA objective 5: Natural resources because the strategic corridors contain sensitive receptors, such as rivers and residential areas. In addition, some fall within Source Protection Zones and/or contain an AQMA. Depending on where minerals development takes place within the strategic corridors and its size, it could result in a significant negative effect on water or air quality. Policies MLP 1 and MLP 2 could also result in mineral development that affects water or air quality and this could be within or outside of the strategic corridors. Policies MLP 2, MLP 4, MLP 5 and MLP 7 could also have a minor positive effect in relation to this SA objective because they seek to enhance green infrastructure through appropriate restoration. In addition, the strategic corridor policies include requirements for any proposed minerals development to prioritise creating or incorporating wetland features such as fen and marsh, wet grassland, reed bed and meadows. This could help to manage and improve water quality.

7.9 All of the strategic corridor policies would have minor positive and uncertain effects in relation to SA objectives 6: Climate change and energy and 7: Flooding. The corridors include rivers and railway links which could provide opportunities for sustainable transportation of minerals, although this is uncertain, as it will depend on loading/unloading facilities and route availability between source and destination. The priorities in the policies also include wetland creation, which could have positive effects for climate change through carbon storage, and flooding through flood water storage. Policies MLP 1 (Strategic Location of Development) and MLP 2 (Borrow Pits) could also have a minor positive effect on climate change due to the potential for sustainable transport modes to be used. However, Policy MLP 1 could also result in more road-based transport of minerals, resulting in a mixed effect for SA objective 6. Both Policies MLP 1 and MLP 2 could have an uncertain minor negative effect on flooding as there is potential for non-sand and gravel spatial options to be located in flood zone 3.

7.10 The potential effects of all of the Spatial Strategy policies (except Policy MLP 3 (Green Infrastructure)) are similar for SA objectives 8: Access to services and 9: Health and amenity. Almost all of the policies could have uncertain significant negative effects because they all contain a number of Public Rights of Way and, depending on where minerals development occurs, could threaten existing routes. Significant negative uncertain effects identified in relation to SA objective 9 also relate to the possibility that minerals development could take place within proximity of residential areas or schools, places of worship and recreation facilities. Minerals development within proximity of these sensitive receptors could affect residents' health and wellbeing through increased levels of noise, dust or other emissions. However, this is mixed with a minor or significant positive impact, as minerals development may improve Public Rights of Way and some are expected to provide new semi-natural accessible green space as part of green infrastructure enhancements during development and restoration. The effect of Policy MLP 2 (Borrow Pits) is minor negative while all the other policies are significant negative. The reduced magnitude of the negative effect recorded for this policy is reflective of smaller-scale borrow pit workings compared to other mineral workings, and the specific criterion in the policy stating that borrow pits will be worked without undue interference with the rights of way network.

Table 7.1: SA findings for the strategic policies in Chapter 4 of the MLP (Spatial Strategy)

SA Objectives	Spatial Strategy (strategic policies)							
	MLP 1	MLP 2	MLP 3	MLP 4	MLP 5	MLP 6	MLP 7	MLP 8
1 Landscape	+/--	+/-?	++	++/-?	++/-?	++/-?	++/-?	++/-?
2 Biodiversity and geodiversity	+/--	+/-?	++	+/--?	+/--?	+/--?	+/--?	+/--?
3 Cultural heritage, architecture and archaeology	+/--	+/-?	++	+/--?	+/--?	+/--?	+/--?	+/--?
4 Material assets	++/--	++?/--?	+	+/--?	+?/--?	--?	--?	--?
5 Natural resources	--?	+/--	++	+/--?	+/--?	--	+/--	--?
6 Climate change and energy	+?/-?	+	++	+?/?	+?/?	+?/?	+?/?	+?/?
7 Flooding	-?	-?	++	+/?	+/?	+/?	+/?	+/?
8 Access to services	+/--?	+/-?	+	+?	+/--?	+/--?	+/--?	+/--?
9 Health and amenity	+/--?	+/--?	+	+?/--?	++/--?	++/--?	++/--?	++/--?
10 Waste	-	-	0	-	-	-	-	-
11 Traffic and transport	+/--?	++	0	+?	+?	+?	+?	+?
12 Growth with prosperity for all	+/--?	0	0	++/--?	++/--?	++	++/--?	++/-?
13 Provision of housing	+/--?	+	+	+/--?	+/--?	+/--?	+/--?	+/--?
14 Participation by all	0	0	0	0	0	0	0	0
15 Technology, innovation and inward investment	0	0	0	0	0	0	0	0
16 Population (skills and education)	0	0	0	+	+	+	+	+
17 Population (crime & fear of crime)	0	0	0	0	0	0	0	0

7.11 Policy MLP 1 (Strategic Location of Development) and all of the strategic corridor policies could have a minor negative effect on SA objective 10: Waste as they all contain a number of existing waste management facilities. If a minerals site were to be developed too close to a waste site, one or both could be compromised. In addition, these policies promote the use of primary mineral extraction. A minor negative effect is also identified for Policy MLP 2 as the workings of borrow pits promote the use of primary mineral extraction rather than encourage the use of recycled and secondary aggregates.

7.12 A number of minor positive and significant positive effects are identified for the Spatial Strategy policies in relation to SA objectives 11: Traffic and transport, 12: Growth with prosperity for all and 13: Provision of housing. Policy MLP 2 (Borrow Pits) could have a significant positive effect on SA objective 11 because the aim of this policy is to work mineral resources within close proximity of a specified development site which will reduce transport distances. Criterion 'b' of the policy requires the minimal use of highways. All of the other policies would have a minor positive effect as there is potential for mineral development to be located within close proximity to rail and water links, although this is uncertain, as it will depend on loading/unloading facilities and route availability between source and destination. In contrast for Policy MLP 1 (Strategic Location of Development) there is also potential for mineral sites to come forward that are located further away from a strategic road network, which could see transport emissions increase, and so a significant negative effect is also identified in combination with the minor positive effect. Mixed effects are also likely for Policy MLP 1 and four of the strategic corridors (Policies MLP 4, MLP 5, MLP 7 and MLP 8) in relation to SA objective 12 as new sites and extensions to existing sites will provide new job opportunities and therefore positive effects have been recorded. In addition, the strategic corridors contain a significant amount of the county's potential resources, and should help to facilitate the extraction and processing of sufficient resources for the development necessary for growth and infrastructure. However, where a potential mineral site or extension is identified on land allocated for employment development or proposed infrastructure delivery (e.g. dualling of Worcester's Southern Link road and Worcestershire Parkway Station), this may conflict with other employment opportunities or the delivery of significant new infrastructure projects, although we recognise that the chances of this are small, and as such an uncertain significant negative effect is also identified. The strategic corridor covered in Policy MLP 6 is not close to other employment allocations or infrastructure so would have significant positive effects only. In relation to SA objective 13: Provision of housing, Policy MLP 2 (Borrow Pits) would have a minor positive effect because borrow pits could potentially provide minerals to support housing developments. Policy MLP 1 and the strategic corridor policies could all have mixed minor positive and significant negative uncertain effects as they would all help to facilitate the extraction and processing of sufficient resources needed to deliver housing and associated development that can help to ensure clean, safe and pleasant local environments. Conversely, there is a small chance that mineral development could be permitted on areas of land allocated for housing through this policy which may make this land unsuitable to facilitate housing development and therefore a significant negative uncertain effect is also identified.

7.13 None of the Spatial Strategy policies would be likely to have an effect on SA objectives 14: Participation by all, 15: Technology, innovation and investment and 17: Population (crime) and Policies MLP 1 to MLP 3 also would have no effect on SA objective 16: Population (skills and education). The strategic corridor policies (Policies MLP 4 to MLP 8) however, would have a minor positive effect in relation to SA objective 16 because the strategic corridor policies seek to encourage "incorporating information or routes which increase the legibility and understanding of the geodiversity, heritage and character of the area". This could provide opportunities for learning within the local community.

Chapter 5: Supply of mineral resources (strategic policies)

7.14 **Table 7.2** summarises the likely SA effects for the eight policies in Chapter 5: Supply of mineral resources (strategic Policies MLP 9 (Secondary & Recycled Materials) to MLP 16 (Energy Minerals)).

7.15 These policies seek to ensure that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the county needs. The level of supply which is considered to be "adequate" varies for different types of minerals, with landbanks of at least 7 years required by the NPPF to be maintained for sand and gravel, at least 10 years for crushed rock, at least 25 years for brick clay and at least 15 years for silica sand where significant new capital is required. The supply of aggregates and industrial minerals is driven by a wide range of development demands which are reliant on a steady supply of materials to maintain certainty in the economy, while the demand for building stone is more likely to be related to a particular project and does not necessarily require a steady amount to be produced annually. Policies MLP 9 to MLP 16 therefore enable the supply of different types of minerals including substitute, secondary and recycled materials and minerals waste. While a number of potentially negative effects have been identified in relation to these policies as discussed below, it is recognised that other policies within the MLP including strategic policies such as Policy MLP 3 (Green Infrastructure) and development management Policies MLP 17 to MLP 30 provide mitigation for the effects identified, and this is set out in **Chapter 9** of the SA Report.

Table 7.2: Summary of SA scores for the policies in Chapter 5 - Supply of mineral resources (strategic policies)

SA Objective	Supply of mineral resources (strategic policies)							
	MLP 9	MLP 10	MLP 11	MLP 12	MLP 13	MLP 14	MLP 15	MLP 16
1 Landscape	+/-?	-?	--?	-?	-?	-?	-?	-?
2 Biodiversity and geodiversity	+/-?	-?	-?	-?	-?	-?	-?	-?
3 Cultural heritage, architecture and archaeology	+/-?	-?	+/-?	+/-?	-?	+/-?	-?	-?
4 Material assets	+	+/-?	+/-?	+/-?	+/-?	+/-?	+/-?	+/-?
5 Natural resources	+/-?	-?	-?	-?	-?	-?	-?	-?
6 Climate change and energy	+	+	+/?	+	+	+	?	--?
7 Flooding	-?	+?	+?/-?	+?/-?	+?/-?	+?/-?	+?/-?	+?/-?
8 Access to services	0	0	0	0	0	0	0	0
9 Health and amenity	+/-?	-?	-?	-?	-?	-?	-?	-?
10 Waste	++	+/-?	+/-?	+/-?	+/-?	+/-?	-	-?
11 Traffic and transport	+/-?	+/-?	+/-?	+/-?	+/-?	+/-?	+/-?	+/-?
12 Growth with prosperity for all	+/-?	+	+?	+	+	0	+	+/-?
13 Provision of housing	+	+?	+?	+	0	+	?	-?

SA Objective	Supply of mineral resources (strategic policies)							
	MLP 9	MLP 10	MLP 11	MLP 12	MLP 13	MLP 14	MLP 15	MLP 16
14 Participation by all	0	0	0	0	0	0	0	0
15 Technology, innovation and inward investment	0	?	?	?	?	?	0	-?
16 Population (skills and education)	0	0	0	0	0	0	0	0
17 Population (crime & fear of crime)	0	0	0	0	0	0	0	0

7.16 Generally minor negative effects are expected for Polices MLP 9 to MLP 16 on SA objectives 1: Landscape, 2: Biodiversity and geodiversity and 3: Cultural heritage, architecture and archaeology, as these minerals supply policies aim to bring forward mineral development, which generally could lead to adverse impacts on environmental assets. Policy MLP 11 (Crushed Rock) could have a significant negative effect as the crushed rock resource is concentrated within and around (and therefore likely to be within the setting of) the Cotswolds and Malvern Hills AONBs. All the effects are uncertain as the effects will depend on the proposals that come forward, which are unknown at this stage. Policy MLP 9 (Secondary & Recycled Materials) would also have minor positive effects on these three SA objectives because increasing the use of substitute, secondary and recycled materials could potentially reduce the need for primary materials and the development needed to extract and process it. Policies MLP 11 (Crushed Rock), MLP 12 (Brick Clay) and MLP 14 (Building Stone) could also have minor positive effects on SA objective 3 as they enable the supply of building materials that could be used to conserve local heritage assets.

7.17 All of the Supply policies (except Policy MLP 9 (Secondary & Recycled Materials)) are likely to have uncertain mixed minor positive and negative effects on SA objective 4: Material assets. The policies allow for a supply of different types of minerals to come forward which encourages primary extraction that could lead to adverse effects on best and most versatile agricultural lands, land of Green Belt value or open space/green infrastructure. However, these policies could also have a minor positive effect given that the policy wording requires proposals to ensure that minerals are worked efficiently and sustainably, which should help to safeguard mineral reserves. Policy MLP 9 would have a minor positive effect in relation to SA objective 4 because encouraging the use of recycled and secondary aggregates should help to reduce the need for primary minerals and therefore help to safeguard mineral reserves.

7.18 Generally minor negative effects are expected for Polices MLP 9 to MLP 16 on SA objectives 5: Natural resources and 9: Health and amenity, as they all aim to bring forward mineral development, which generally could lead to some adverse impacts on the sensitive receptors associated with these environmental and social SA objectives (i.e. water, air and Worcestershire residents). All the mixed effects are uncertain as the effects will depend on the proposals that come forward, and this is unknown at this stage. Policy MLP 9 (Secondary & Recycled Materials) would have a minor positive effect because encouraging the use of recycled and secondary aggregates should help to reduce the need for primary mineral extraction sites.

7.19 A significant negative effect is identified for Policy MLP 16 (Energy Minerals) in relation to SA objective 6: Climate change and energy as by supporting the provision of fossil fuels (coal, oil and gas) which contribute to emissions that exacerbate climate change, it therefore compromises all the aims of this SA objective. Conversely, minor positive effects are identified for Policies MLP 9 to MLP 14. These positive effects are expected given that Policy MLP 9 (Secondary & Recycled Materials) supports the use of recycled and secondary aggregates and Policies MLP 10 to MLP 14

support productive capacity and "investment in developing, maintaining or improving new or existing plant and equipment" which is likely to reduce emissions, therefore resulting in benefits relating to a reduced contribution in terms of climate change. An uncertain effect is identified for Policy MLP 15 (Other Industrial Minerals) as the type and location of these resources, and the development that would be required to extract and process them, are unknown and there is no wording in this Policy that seeks to minimise mineral workings' impact on climate change.

7.20 Mixed minor positive and negative effects are likely for most of the Supply policies in relation to SA objective 7: Flooding as all types of mineral development, excluding sand and gravel extraction, while suitable in almost all flood zones, are not suitable in 3b (the functional floodplain) where development could have an adverse effect on flooding. However, minerals development sites may also have the potential to increase flood capacity through their eventual restoration, but all effects are uncertain as they depend on the location, design and restoration techniques to be implemented. Policy MLP 10 is likely to have a minor positive effect only as sand and gravel sites are suitable in all flood zones and could have potential to increase flood capacity through their eventual restoration. Recycled and secondary aggregate facilities are not the same as mineral extraction sites in terms of the limited scope that these types of sites offer for achieving enhanced flood storage through restoration and considering that this type of development is unlikely to be considered to be 'water-compatible'. As Policy MLP 9 supports this type of development where it would accord with the policies of the Waste Core Strategy, minor negative effects are expected in relation to SA objective 7, although this is also uncertain depending on the specific location and design of the facilities.

7.21 No effects are likely for any of the Supply policies in relation to SA objective 8: Access to services.

7.22 One significant positive effect is identified for Policy MLP 9 (Secondary & Recycled Materials) on SA objective 10: Waste. The key aim of the policy reflects that of the waste hierarchy by promoting the reuse and recycling of waste materials, including mineral waste, and avoiding waste going to landfill. Policies MLP 10 to MLP 16 all support the primary extraction of material, so minor negative effects are expected in relation to SA objective 10. A minor positive effect is also expected for Policies MLP 10 to MLP 14 as these policies require the supply of minerals to maximise productive capacity which will reduce waste and the need to develop sites elsewhere. The effects for Policies MLP 10 to MLP 14 and 16 are all uncertain as they will depend on the scale, location and design of the extraction sites that come forward.

7.23 All the eight Supply policies are likely to have an uncertain mixed minor positive and minor negative effect on SA objective 11: Traffic and transport. All these policies support a steady and adequate supply of minerals/energy within Worcestershire, which could help to reduce the need for imported materials from outside the county and thereby reduce the distance minerals need to travel. A minor positive effect in relation to SA objective 11 is therefore identified. It is recognised that the historic trends of zero tonnes per annum crushed rock production within the county since 2010, could mean that crushed rock continues to be imported with possibly longer transport distances. The minor negative effect for all the policies is attributed as it is unknown whether the transportation of minerals/energy resources will utilise either sustainable transport modes (e.g. rail/water) or the road network. As there is potential for use of the road network, a minor negative effect is recorded, although this is uncertain given that the modes of transport which are likely to be used are unknown at this stage.

7.24 The Supply policies are likely to have generally minor positive effects in relation to SA objectives 12: Growth with prosperity for all and 13: Provision of housing. It is expected that enabling a steady and adequate supply of minerals will help to meet the county's need and will encourage growth of the minerals industry, inward investment and employment opportunities. Maintaining a steady and adequate supply of minerals is also likely to help contribute to development of housing. In addition, many of the policies encourage the enhancement of productive capacity at minerals sites, which could result in a reduced need for additional sites of this type, and limit any potential negative effects relating to maintaining clean, safe and pleasant local environments for housing. However, Policy MLP 9 (Secondary & Recycled Materials) could also have minor negative effects on economic prosperity (SA objective 12) because encouraging the market for recycled and secondary minerals could limit primary mineral extraction and the associated economic benefits. Furthermore, minor negative effects are identified for MLP 16 (Energy Minerals) as

increasing carbon costs and corporate social responsibility may make fossil fuel use less attractive in the longer term. Policy MLP 16 (Energy Minerals) is also expected to have a minor negative effect on the provision of housing (SA objective 13) considering that energy minerals developments could have adverse impacts on the local environments for residential areas. Policy MLP 13 (Silica Sand) is assessed as having no effect on SA objective 13 as silica sand is not used in housing construction. Policy MLP 15 (Other Industrial Minerals) has been identified as having uncertain effects for SA objective 13 , as the type and location of other industrial minerals addressed through Policy MLP 15, as well as the development that would be required to extract and process them, is unknown.

7.25 Policies MLP 10 to MLP 14 could help to encourage the enhancement of productive capacity at certain types of minerals sites, which could see the use of low-impact, resource-efficient technologies if such approaches are employed to maximise capacity. However, it is unknown at this stage if these types of technologies would be made use of and therefore the effect recorded in relation to SA objective 15: Technology, innovation and inward investment is uncertain. Policy MLP 9 (Secondary & Recycled Materials) and Policy MLP 15 (Other Industrial Minerals) are unlikely to affect this SA objective and therefore no effect has been recorded. Only Policy MLP 16 (Energy Minerals) is likely to have a minor negative effect as opportunities to promote and support resource-efficient technologies could be compromised by coal, oil and gas development, although this is uncertain as it will depend on the scale and design of new development.

7.26 No effects are expected for all eight policies in relation to SA objectives 14: Participation by all, 16: Population (skills and education) and 17: Population (crime & fear of crime).

Chapter 6: Development management (non-strategic policies)

7.27 **Table 7.3** summarises the SA findings for the 14 policies in Chapter 6: Development Management, which show that these policies are likely to have mostly positive effects for those SA objectives that they relate to. Given the focus of the development management policies on specific topics, negligible or no effects are also likely for many of the SA objectives.

Table 7.3: SA scores for Development management (non-strategic policies)

SA objective	Development Management Policy													
	MLP 17	MLP 18	MLP 19	MLP 20	MLP 21	MLP 22	MLP 23	MLP 24	MLP 25	MLP 26	MLP 27	MLP 28	MLP 29	MLP 30
SA 1: Landscape	++	+	+	+	+	+	++	+/-	+	+	+	+	+	+
SA 2: Biodiversity and geodiversity	+	+/?	+	+	++	+	+	+/-	+	++	+	+	+	+
SA 3: Cultural heritage, architecture and archaeology	+	+/?	+	+	+	++	++	?	+	+	+	+	+	+
SA 4: Material Assets	+	+	0	+	+	+	+	+	+	+	+	+	+	0
SA 5: Natural Resources	+	+/?	+	0	+	0	0	+	0	0	++	+	+	+
SA 6: Climate Change and energy	++	+	0	0	+	+/-?	+/-?	+	+	0	0	+	+	0
SA 7: Flooding	+	+	0	0	+	0	0	+	+	0	+	++	+	0
SA 8: Access to Services	0	0	0	++	+	0	0	0	0	0	+?	+	+	0
SA 9: Health and Amenity	+	+	+	++	+	0	0	+/-?	0	0	+	+	+	+
SA 10: Waste	+	0	+	0	0	0	0	+	0	0	0	0	0	0
SA 11: Traffic and Transport	+	-?	+	++	+	0	0	+	0	0	0	0	+	0
SA 12: Growth with prosperity for all	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SA 13: Provision of housing	0	+	+	+	+	+	+	+/-?	?	+	+	+	+	+
SA 14: Participation by all	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SA 15: Technology, innovation and inward investment	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SA 16: Population (skills and education)	0	0	0	0	0	0	0	0	0	+	0	0	0	0

SA objective	Development Management Policy													
SA 17: Population (crime and fear of crime)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

7.28 It is expected that the development management policies would have broadly positive effects in relation to the SA objectives. Significant positive effects have been recorded in relation to those SA objectives that the policies seek to directly address.

7.29 Positive effects have been identified for most of the development management policies in relation to SA objective 1: Landscape, SA objective 2: Biodiversity and geodiversity, SA objective 3: Cultural heritage, architecture and archaeology, SA objective 4: Material assets and SA objective 5: Natural resources. These policies require that proposed minerals development is considerate of elements of the built and natural environment, which is expected to help protect landscape, biodiversity and geodiversity, cultural heritage, architecture and archaeology and water and/or air quality in Worcestershire.

7.30 A significant positive effect is expected for Policy MLP 17 (Prudent Use of Resources) and Policy MLP 23 (Landscape) in relation to SA objective 1: Landscape given that these policies specifically require minerals development to protect and enhance landscape character. Only one policy (Policy MLP 24 (Soils)) is likely to have a negative effect in relation to this SA objective. This minor negative effect is expected because this policy supports soil stripping and storing of soils at minerals sites which may adversely affect the landscape character of a given area. However, soil storage may offer a means of mitigating other adverse effects on landscape character (e.g. by storing as bunds) meaning that the minor negative effect expected in relation to SA objective 1 is likely to be combined with a minor positive effect.

7.31 Of the fourteen development management policies which are expected to have a positive effect in relation to SA objective 2: Biodiversity and geodiversity only two (Policy MLP 21 (Biodiversity) and Policy MLP 26 (Geodiversity)) are expected to have a significant positive effect. Policies MLP 21 and MLP 26 directly seek to protect, conserve and enhance biodiversity and geodiversity respectively. The minor positive effect expected in relation to this SA objective for Policy MLP 24 (Soils) is likely to be combined with a minor negative effect. While the policy requires that mineral development is protective of soil resources, it also supports soil stripping, which could affect existing habitats and geodiversity or could create new habitats and reveal undiscovered geodiversity features.

7.32 Only two policies are expected to have a significant positive effect in relation to SA objective 3: Cultural heritage, architecture and archaeology. Policy MLP 22 (Historic Environment) and Policy MLP 23 (Landscape) would directly seek to protect, conserve and enhance the historic environment and character and distinctiveness of the landscape which could also help to protect the settings of heritage assets in Worcestershire.

7.33 A majority of the development management policies (nine of fourteen) are likely to have a positive effect in relation to SA objective 5: Natural resources. The positive effect for Policy MLP 27 (Water Quality and Quantity) is expected to be significant given that the policy would directly help to protect water quality. This policy requires that proposed minerals development does not have "an unacceptable effect on the quality, quantity or flow of ground or surface water".

7.34 Only Policy MLP 17 (Prudent Use of Resources) is expected to have a significant positive effect in relation to SA objective 6: Climate change and energy with an additional eight development management policies likely to have a minor positive effect in relation to this SA objective. The significant positive effect identified in relation to this SA objective for Policy MLP 17 is expected given that this policy requires proposed minerals development to optimise on-site energy generation from renewable and low-carbon sources. For Policies MLP 22 (Historic Environment) and MLP 23 (Landscape), the minor positive effect is mixed with a minor negative uncertain effect in relation to this SA objective, as opportunities to develop renewable and low-carbon energy on minerals sites may be limited by the requirement to protect the historic environment and areas of landscape value, depending on how stringently such requirements are adhered to.

7.35 As Policy MLP 28 (Flooding) requires that minerals development avoids increasing flood risk, a significant positive effect is expected in relation to SA objective 7: Flooding. An additional seven development management policies are likely to have a minor positive effect on this SA objective given that they would help to promote the infiltration of surface water, prevent increased rates of run-off or generally seek to manage the effects of minerals development on the water environment.

7.36 Policy MLP 20 (Access and Recreation) seeks to improve the quality of and access to rights of way and greenspace. Considering that these features play an important role as recreational features in Worcestershire while also providing access to services and facilities further afield, a significant positive effect has been recorded in relation to SA objective 8: Access to services and SA objective 9: Health and amenity. The support for incorporating green infrastructure set out in Policy MLP 21 (Biodiversity), Policy MLP 27 (Water Quality and Quantity), Policy MLP 28 (Flooding) and Policy MLP 29 (Transport) may help to improve access to services and facilities as well as encouraging more active lifestyles among residents of Worcestershire. Therefore, further minor positive effects have been identified in relation to these two SA objectives for these four policies. Four other policies (MLP 17, MLP 18, MLP 19 and MLP 30) could have a minor positive effect on SA objective 9 as they would provide indirect benefits to health and/or amenity through their policy requirements and by enabling access to the countryside. Only one development policy (Policy MLP 24 (Soils)) is likely to have a minor negative effect in relation to SA objective 9 as, although stripping and storing of soils may reduce the potential for adverse impacts on the local environment, they may - depending on the proximity of such activities to residential areas - result in loss of amenity.

7.37 The majority of the development management policies are likely to have no effect in relation to SA objective 10: Waste. A minor positive effect has been identified for only three of these policies: Policy MLP 17 (Prudent Use of Resources), Policy MLP 19 (Amenity) and Policy MLP 24 (Soils). It is expected that these policies would indirectly help to promote the achievement of the waste hierarchy including the re-use and recovery of waste.

7.38 Only six of the fourteen development management policies are expected to have a positive effect in relation to SA objective 11: Traffic and transport. Of these six policies only one (Policy MLP 20 (Access and Recreation)) is likely to have a significant positive effect in relation to this SA objective, given that it would help to protect and enhance rights of way and public access provision in Worcestershire. Five additional development management policies are likely to indirectly help promote modal shift in the county through the incorporation of improvements such as green infrastructure and reducing the need to travel by private car. In contrast, Policy MLP 18 (Green Belt) is likely to result in an uncertain minor negative effect on SA objective 11 as the policy does not prevent all mineral development coming forward within the Green Belt, but could prevent some developments, depending on the specific circumstances. There is therefore a risk that developments will be forced to less sustainable locations in order to comply with Green Belt policy, and will require transport across the Green Belt to reach intended markets. This could result in increased journey times and/or use of less sustainable modes of transport.

7.39 It is expected that protection and enhancement of the local environment associated with important elements of the landscape, biodiversity, natural resources (including air quality, water quality and flood risk) and the built historic environment would help to ensure residents have clean, safe and pleasant areas to live in. As such the majority (eleven of fourteen) of the development management policies are likely to have a minor positive effect in relation to SA objective 13: Provision of housing. The minor positive effect expected in relation to this SA objective for Policy MLP 24 (Soils) is likely to be combined with a minor negative effect. The overall mixed effect is likely considering that while stripping and storing of soils may help to maintain the condition of the local environment, the inappropriate siting of soil stripping and storage could result in loss of amenity.

7.40 Only one of the fourteen development management policies (Policy MLP 26 (Geodiversity)) is expected to have a minor positive effect in relation to SA objective 16: Population (skills and education) with the remaining policies likely to have no effect. This policy requires that minerals development would optimise opportunities to improve the legibility and understanding of geodiversity. It is expected that this requirement may make a contribution in terms of local people's education and their relationship with the history and management of geological assets in the county.

Chapter 7: Safeguarding mineral resources and supporting infrastructure (strategic policies)

7.41 **Table 7.4** summarises the SA scores for the two policies in Chapter 7: Safeguarding mineral resources and supporting infrastructure (strategic policies). These policies generally have mixed positive and negative effects, as they could prevent development that would have adverse effects and sterilise mineral resources, but they could also lead to some level of minerals development, with the potential for associated negative effects.

7.42 While a number of potentially negative effects have been identified in relation to these policies as discussed below, it is recognised that other policies within the MLP including strategic policies such as Policy MLP 3 (Green Infrastructure) and development management Policies MLP 17 to MLP 30 provide mitigation for the effects identified, and this is set out in **Chapter 9** of the SA Report.

Table 7.4: Summary of SA scores for the policies in Chapter 7 (Safeguarding mineral resources and supporting infrastructure)

SA Objective	Safeguarding mineral resources and supporting infrastructure (strategic policies)	
	MLP 31	MLP 32
1 Landscape	+?/-?	+?/-?
2 Biodiversity and geodiversity	+?/-?	+?/-?
3 Cultural heritage, architecture and archaeology	+?/-?	+?/-?
4 Material assets	++?/ -?	++?/ -?
5 Natural resources	+?/-?	+?/-?
6 Climate change and energy	+?/-?	+?/-?
7 Flooding	+/?	+/?
8 Access to services	+?/-?	+?/-?
9 Health and amenity	+?/-?	+?/-?
10 Waste	-?	-?
11 Traffic and transport	+?/-?	+?/-?
12 Growth with prosperity for all	+/-	+/-
13 Provision of housing	+?/-?	+?/-?
14 Participation by all	0	0

SA Objective	Safeguarding mineral resources and supporting infrastructure (strategic policies)	
	MLP 31	MLP 32
15 Technology, innovation and inward investment	+/-	+/-
16 Population (skills and education)	0	0
17 Population (crime & fear of crime)	0	0

7.43 Mixed uncertain minor positive and minor negative effects are expected for both Policy MLP 31 (Safeguarding mineral resources) and Policy MLP 32 (Safeguarding mineral sites and infrastructure) across SA objectives 1: Landscape, 2: Biodiversity and geodiversity, 3 Cultural heritage, architecture and archaeology, 5: Natural resources and 6: Climate change and energy. The minor positive effects reflect that safeguarding of minerals may prevent development that would negatively impact the environment in relation to these SA objectives. The minor negative effects reflect the potential for safeguarding of minerals to lead to more minerals extraction activities, which may significantly compromise the environment in relation to each of these SA objectives. The effects of these policies are uncertain for both the minor positive and minor negative effects as the process of safeguarding does not necessarily mean that extraction will be permitted to take place or that non-mineral development will not be permitted to take place.

7.44 Effects on SA objective 4: Material assets are expected to be mixed uncertain significant positive and minor negative. The significant positive effect is due to the safeguarding of minerals in the policies relating directly to the purpose of SA objective 4.

7.45 Minor positive effects are expected for SA objective 7: Flooding, as these policies could reduce the likelihood of development coming forward that would be susceptible to flooding, either through preventing the delivery of non-minerals development that could be susceptible to this type of risk, or by preventing non-minerals development that could increase risk of flooding elsewhere. In addition, minerals extraction could provide increased flood storage in the long term.

7.46 Policy MLP 31 (Safeguarding mineral resources) and Policy MLP 32 (Safeguarding mineral sites and infrastructure) are likely to have uncertain minor positive and minor negative effects on SA objectives 8: Access to services, 9: Health and amenity and 11: Traffic and transport. The minor positive effects are due to the likelihood that safeguarding may restrict non-mineral developments that would negatively impact access to the services and facilities supported in these SA objectives. The minor negative effects reflect the fact that safeguarding of minerals could lead to increased mineral extraction which could negatively impact these SA objectives. The safeguarding of minerals sites could also prevent non-mineral development that may otherwise lead to provision of services and facilities for communities and/or improved sustainable transport links or development that would benefit from existing sustainable transport links. All effects are uncertain as the process of safeguarding does not necessarily mean that extraction will be permitted to take place or that non-mineral development will not be permitted to take place.

7.47 An uncertain minor negative effect is expected for both Policy MLP 31 and Policy MLP 32 in relation to SA objective 10: Waste. It is unlikely that minerals sites supported through the safeguarding set out through the policies will have adverse effects on waste management infrastructure. However, the minor negative effect can be attributed to both the policies promoting primary mineral extraction, rather than re-use or recycling of materials.

7.48 A mixed minor positive and minor negative effect is expected for both Policy MLP 31 (Safeguarding Mineral Resources) and Policy MLP 32 (Safeguarding Mineral Sites and Infrastructure) in relation to SA objective 15: Technology, Innovation and Inward Investment. The minor positive effect reflects the policies' support for ensuring the availability of minerals,

which can support the physical component of delivering development related to this SA objective. The minor negative effect acknowledges the potential for safeguarding to hamper non-minerals development that supports development of new technologies.

7.49 For the remaining SA objectives, 14: Participation for All, 16: Population (skills and education) and 17: Population (crime and fear of crime), no effects are expected for Policy MLP 31 and Policy MLP 32.

8 Evolution of the MLP and reasonable alternatives

8.1 The SEA Regulations require the SA to provide 'an outline of the reasons for selecting the alternatives dealt with' and this is reflected in the PPG. This chapter gives an overview of the evolution of the MLP in terms of the SA, including how reasonable alternatives were identified, why the selected approach was taken forward and why other approaches were not. More detail is provided in WCC's Evolution of the Minerals Local Plan and reasonable alternatives up to the Fourth Stage Consultation (November 2018), which has been reproduced in **Appendix 6**. Where reasonable alternatives exist, these have been appraised through the SA process. While the document in **Appendix 6** discusses the evolution of the 'Portrait of Worcestershire', this has not been considered as an option in SA terms, as it sets out background information for the plan, whereas the SA focuses on the policy and spatial options in the plan.

First Stage Consultation

8.2 Production of the Minerals Local Plan began with a First Stage Consultation during the autumn/winter of 2012/13. Comments were also requested on a series of background documents which had been prepared to provide evidence on what sort of minerals might be needed in Worcestershire, in what quantities and how they might be worked. Options for policies or spatial options to be included in the MLP were not defined at this stage.

8.3 This consultation was accompanied by the first stage of SA, which was the Scoping Report. This gathered information on the sustainability baseline and key issues in Worcestershire and set out the sustainability framework, against which draft versions of the MLP (including any policy and spatial options) would be assessed.

Second Stage Consultation

8.4 The Second Stage Consultation MLP was published for consultation between autumn 2013 and spring 2014. This document built on responses received on the first consultation to provide a clearer direction for minerals working in Worcestershire. It set out the likely scale of minerals that the plan would need to provide for, and ways in which these targets could be met. It also set out the key issues in a more accessible way through a 'Portrait of Worcestershire', and included elements common to most planning policy documents: a draft vision and objectives, and a range of options for addressing specific issues through policies that would come at a later stage. It also proposed 'areas of search' for aggregates and an 'opportunity area' for clay, as well as ideas for how mineral workings in these areas should be restored. Options for how minerals could be safeguarded were also included.

8.5 This consultation was accompanied by the Second Consultation Draft Initial SA Report (November 2013), which appraised the emerging options in order to inform the next stage of MLP preparation. Many aspects of the Second Consultation Draft presented a general direction for the MLP or discussed relevant issues, rather than identifying specific options. As such, much of the accompanying SA Report provided general commentary on the MLP, rather than an assessment of specific options against each of the SA objectives. The SA also suggested a number of possible alternatives to the approach set out in the MLP, but most of these were not considered to be reasonable alternatives by WCC, for the reasons set out in **Appendix 6**. For example, basing areas of search on sustainable transport was not considered reasonable because opportunities for

freight transport via rail or water are uncertain and likely to be limited; therefore this option would fail to provide sufficient minerals over the plan period. A summary of the options that were appraised against each of the SA objectives at this stage of SA is presented in **Table 8.1**. The results of these appraisals are presented in **Appendix 12.**

Table 8.1: Alternatives in the Second Stage Consultation MLP that were assessed in the Initial SA Report (November 2013)

Relevant section of the Second Stage Consultation MLP	Alternatives appraised
Vision	The only alternative identified would be to not have a vision, which is not considered to be a reasonable alternative.
Objectives	No reasonable alternatives were identified for the eight Objectives set out in the Second Draft Consultation MLP.
How much mineral will we make provision for?	Security of future supply/meeting the landbank requirement: A: Assume there is no permitted landbank at the start of the plan period. B: Assume the shortfall in landbank continues at current (published) levels. C: Assume there is no shortfall in landbank at the start of the plan period.
How will minerals be worked?	This section of the Second Consultation Draft did not give detail on how minerals will be worked, but rather set out a range of issues that would be addressed through policies in the next iteration of the MLP, which were assessed collectively by the SA. Given the general nature of these issues, no reasonable alternatives were identified.
Issues to be addressed by the site-specific location policies	The SA carried out a single assessment of the issues to be addressed by the site-specific location policies, as set out in the Second Consultation Draft MLP. Given the general nature of these issues, no reasonable alternatives were identified.
Alternative approaches for driving the delivery of the restoration policies	A: develop policies that require proposals to demonstrate how they have given proportionate weight to the hierarchy of considerations identified in the restoration profiles. B: develop policies for each area of search and the opportunity area for clay, outlining more location specific considerations. C: develop policies and a "spatial master-plan" for each area of search and the opportunity area for clay, outlining more location specific considerations for each area of search.
Cross-cutting site-specific restoration policies to be applied to all mineral developments.	The MLP had not yet suggested any policy options, but the list of issues provides a clear policy direction. There were 26 issues in total, grouped into six broad categories (Impacts on health, amenity and Worcestershire's key economic sectors; Climate change; Sustainable transport; Natural and historic environment; Open and effective engagement; and Other issues). The SA carried out a single assessment to consider the implications of addressing these issues in restoration policies.

First and Second Call for Sites

8.6 In the summers of 2014 and 2015, Worcestershire County Council undertook two further consultations. These were 'calls for sites'[21], designed to allow landowners and minerals operators to propose locations for the council to consider as site allocations for future mineral working. These consultations marked a shift in the Council's approach to considering the location of future mineral development, as a change in government policy and responses to the Second Stage consultation made it clear that specific site allocations should be explored in preference to 'areas of search' alone. The call for sites consultations were not accompanied by any SA documents, as

[21] The 2015 consultation also included a call for mineral resources or supporting infrastructure which should be safeguarded, and asked for comments on the suite of background evidence documents.

they did not themselves set out any proposals, and were part of the technical evidence base to inform the Third Stage Consultation.

Third Stage Consultation and Third Call for Sites

8.7 The 'Third Stage Consultation' built on previous consultation responses and included "you said / we did" sections explaining how the approach in each chapter had been developed. The sites submitted in response to the First and Second calls for sites and subsequent evidence gathered during assessment of the sites was reflected in the Third Stage consultation.

8.8 The consultation document was more detailed than at earlier stages, setting out a full draft of proposed policy wording and site allocations to enable comment on the principles of the plan and the specific issues it sought to address. The consultation document included policies to: protect and enhance health, well-being and the natural and historic environment; safeguard important mineral resources and mineral infrastructure for the future; and identified 'strategic corridors' (with the status of 'areas of search') to direct where and how mineral development should take place to deliver co-ordinated multifunctional green infrastructure benefits, as well as identifying proposed 'specific site' and 'preferred area' site allocations. The Third Stage Consultation also included a further (Third) call for sites.

8.9 A deliverability assessment[22] was undertaken of the 30 sites submitted through the call for sites to assess the likelihood of each site coming forward for working within the lifetime of the plan based upon the submitted information. Consideration against the criteria set out in the deliverability assessment led to three sites being taken forward as 'specific sites' and two sites as preferred areas in the Third Stage Consultation document.

8.10 The Third Stage Consultation also proposed five "strategic corridors" with the status of areas of search. These strategic corridors were defined through professional judgement based upon where clusters of "key" and "significant" resources were located within coherent landscape types.

8.11 The Third Stage Consultation was accompanied by the Third Stage Consultation Sustainability Appraisal Environmental Report (December 2016), which appraised the emerging options in order to inform the next stage of MLP preparation. A summary of the options appraised in the SA Report accompanying the Third Stage Consultation is set out in **Table 8.2**. A number of additional options were considered for various aspects of the MLP, but these were generally not considered to be reasonable. The results of the SA of the Third Stage Consultation MLP are presented in **Appendix 12.**

Table 8.2: Alternatives in the Third Stage Consultation MLP that were assessed in the Third Stage Consultation Sustainability Appraisal Environmental Report (December 2016)

Relevant section of the Third Stage Consultation MLP	Alternatives appraised
Vision	The vision amended and built on the first alternative vision presented in the Second Stage Consultation MLP. The updated vision was assessed in the SA Report.
Objectives	The alternative Objectives presented in the Second Stage Consultation MLP were updated and refined to reflect recommendations of the SA and consultation responses, resulting in the 12 objectives presented in the Third Stage Consultation MLP. Generally, the overall principles of the objectives were not changed, but the way they were presented

[22] Worcestershire County Council (Winter 2016) Worcestershire Minerals Local Plan Background Document: Deliverability Assessment, available at www.worcestershire.gov.uk/mineralsbackground

Relevant section of the Third Stage Consultation MLP	Alternatives appraised
	was refined. A new objective, 'deliver development in accordance with the priorities of the spatial strategy' was added following the SA recommendation that objectives could refer to the appropriate location of mineral operations.
Spatial Strategy Policy MLP 1: Strategic Location of Development Policy MLP 2: Avon and Carrant Brook Strategic Policy Corridor Policy MLP 3: Lower Severn Strategic Corridor Policy MLP 4: North East Worcestershire Strategic Corridor Policy MLP 5: North West Worcestershire Strategic Corridor Policy MLP 6: Salwarpe Tributaries Strategic Corridor	The following alternatives to Policy MLP 1 were appraised: A larger number of smaller corridors Corridors based on Environmental Character Areas
Specific sites and preferred areas	30 alternative site options were identified through the first and second calls for sites, all of which were subject to SA. The options of not allocating specific sites or preferred areas and allocating a larger/smaller number of sites were also considered, but these were not considered to be reasonable alternatives.
Steady and adequate supply of mineral resources Policy MLP 7: Contribution of Substitute, Secondary and Recycled Materials and Mineral Waste to Overall Minerals Supply Policy MLP 8: Steady and Adequate Supply of Sand and Gravel Policy MLP 9: Steady and Adequate Supply of Crushed Rock Policy MLP 10: Steady and Adequate Supply of Brick Clay and Clay Products Policy MLP 11: Steady and Adequate Supply of Silica Sand Policy MLP 12: Adequate and Diverse Supply of Building Stone Policy MLP 13: Supply of Other Locally and Nationally Important Industrial Minerals Policy MLP 14: Supply of Energy Minerals	No reasonable alternatives were identified as these draft policies were based on the evidence set out in the background documents (such as availability of current permitted sites, likely level of need based on past sales etc.).
Development management Policy MLP 15: Sustainable Design Principles Policy MLP 16: Health and Quality of Life Policy MLP 17: Access and Recreation Policy MLP 18: Biodiversity Policy MLP 19: Landscape Policy MLP 20: Agriculture and Soils Policy MLP 21: Geodiversity Policy MLP 22: Water Environment Policy MLP 23: Historic Environment Policy MLP 24: Transport To and From Site Policy MLP 25 : Transport Within Mineral Sites Policy MLP 26: Sustainable Development Delivery	One potential alternative was identified; use a 'buffer' or threshold approach to protect sensitive receptors. However, this was not subject to full SA as the issues were considered to be similar to those set out in the 'A larger number of smaller corridors' assessment as set out in the Spatial Strategy alternatives.
Safeguarding minerals and supporting infrastructure Policy MLP 27: Safeguarding Locally and Nationally Important Mineral Resources Policy MLP 28: Safeguarding Permitted Mineral Sites and Supporting Infrastructure	No additional reasonable alternatives were identified as these draft policies reflected the requirements of national policy.

Fourth Call for Sites

8.12 A significant concern was apparent in responses to the Third Stage Consultation in relation to Worcestershire's ability to supply adequate sand and gravel resources due to the small number of proposed site allocations and low level of industry interest. There was also some concern about the robustness of the site selection process.

8.13 In response to this a further call for sites was undertaken, working with Worcestershire County Council's Content and Communications team to specifically target the minerals industry and landowners. The call for sites was open for a period of 18 weeks from September 2017 to January 2018 to provide as much opportunity as possible for landowners and operators to gather the necessary information.

8.14 The call for sites consultation was not accompanied by any SA documents, as it did not set out any proposals, and was part of the technical evidence base to inform the Fourth Stage Consultation.

Fourth Stage Consultation

8.15 The MLP was updated from the Third Stage Consultation MLP in order to address issues raised in that round of consultation, including the SA, as well as reflecting changes to national policy in the revised National Planning Policy Framework which was published in July 2018. As required by national policy, it differentiated between strategic and non-strategic policies.

8.16 In response to the Third Stage Consultation, concerns were raised about the ability of the plan to supply adequate sand and gravel resources and the reliance on windfall. This was due to the small number of specific sites and preferred areas proposed in the consultation document, the robustness of the site selection process and the large scale of strategic corridors (which had the status of areas of search) lacking certainty about where development would take place. As such, one of the key changes to the plan between the Third and Fourth Stage consultations was the removal of specific sites and preferred areas, which will now be allocated through a separate DPD, following more assessment (including SA). This approach was pursued to maximise the ability for preparation of the main Minerals Local Plan to stay on course and for strategic policies to be put in place as quickly as possible. In addition, it builds in flexibility for the Site Allocations to be reviewed and revised if necessary without affecting the strategic policies set out in the Minerals Local Plan.

8.17 The strategic corridor boundaries and mineral safeguarding areas were amended since the Third Stage to account for key constraints, e.g. to remove settlements and sites allocated in other parts of the Development Plan. In addition, WCC reviewed the role of strategic corridors so that rather than having the status of areas of search in themselves, they provide policy direction, with specific areas of search for different mineral types being identified within them. Defining these areas of search was based on BGS resource areas with sufficient resource available for working within these. The resulting areas were then further refined, following a screening process to rule out environmental and amenity criteria that would mean locations would be unlikely to be acceptable in planning terms (and were therefore not considered to be reasonable alternatives). Further detail on this screening process is presented in the background document 'Location of development: screening and site selection methodology'[23] (hereafter referred to as 'Screening and Site Selection Methodology').

8.18 The screening criteria used are presented in Appendix A of the Screening and Site Selection Methodology, and represent types of land with national or international designations which should

[23] Worcestershire County Council (August 2018) Worcestershire Minerals Local Plan Background Document: Location of development: screening and site selection methodology

be afforded the highest level of protection (e.g. Ancient Semi-Natural Woodland, Areas of Outstanding Natural Beauty and Special Areas of Conservation). Applying these criteria means that none of these designated areas are included within the areas of search, reflecting the NPPF requirements that plans should allocate land with the least environmental or amenity value, that distinctions should be made between the hierarchy of international, national and locally designated sites, and that heritage assets are an irreplaceable resource and should be conserved in a manner appropriate to their significance. These same criteria will be applied to the potential site allocations put forward during the Call for Sites exercises, when they are assessed as part of preparing the new site allocations DPD, after having first been screened for deliverability (in terms of the amount of mineral resource the site contains and whether there is support from the landowner and mineral operator). Those that make it through the deliverability screening and second screening against the international and national designations will be further screened against the criteria set out in Appendix B of the Screening and Site Selection Methodology. The criteria in Appendix B represent local designations which may impact upon the appropriate design or working methods of a site.

8.19 Jointly, the screening criteria in Appendices A and B of the Screening and Site Selection Methodology cover almost all of the 'SEA topics' listed in Schedule 2 of the SEA Regulations[24], which must be covered by the SEA/SA process. The application of the Screening and Site Selection Methodology should therefore help to ensure that the sites that are eventually allocated as specific sites and preferred areas are less likely to significantly affect sensitive environmental receptors, the local population and human health. Only 'climatic factors' is not covered by the screening criteria (population and human health are indirectly covered by the criteria relating to air quality, water quality and flooding). However, in addition to the assessment process being used to select specific sites and preferred areas, all of the potential site allocations that make it through the deliverability screening will be considered as reasonable alternatives for the purpose of the SA and assessed against the SA framework as well (which includes SA objective 6: Climate Change and Energy covering greenhouse gas emissions, energy efficiency and renewable energy, and SA Objective 9: Health and Amenity).

8.20 The Fourth Stage Consultation was accompanied by the Fourth Stage Consultation Sustainability Appraisal Report (November 2018).

[24] These are: (a) biodiversity; (b) population; (c) human health; (d) fauna; (e) flora; (f) soil; (g) water; (h) air; (i) climatic factors; (j) material assets; (k) cultural heritage, including architectural and archaeological heritage; (l) landscape.

8.21 **Table** 8.3 summarises the options considered in the preparation of the SA to accompany the Fourth Stage Consultation Draft MLP. No additional reasonable alternatives were identified to those discussed for previous stages of the SA and MLP.

Table 8.3: Alternatives in the Fourth Stage Consultation MLP that were assessed in the Fourth Stage Consultation Sustainability Appraisal Environmental Report (November 2018)

Relevant section of the Fourth Stage Consultation MLP	Alternatives appraised
Vision	The vision was amended and built on the second alternative vision presented in the Third Stage Consultation MLP. The assessment of the updated vision was presented in Chapter 5 of the November 2018 SA Report.
Objectives	The alternative Objectives presented in the Third Stage Consultation MLP were updated and refined to reflect recommendations of the SA and consultation responses, resulting in the six objectives presented in the Fourth Stage Consultation MLP. Generally, the overall principles of the objectives were not changed, but the way they were presented was refined. The objective 'deliver development in accordance with the priorities of the spatial strategy' from the Third Stage Consultation MLP was removed from the Fourth Stage Consultation MLP, as WCC considered that the spatial strategy is not an objective of the plan, rather a mechanism by which other objectives will be delivered. In the Fourth stage, objectives were focused on what the MLP seeks to achieve, rather than a specific strategy to achieve this. The objective 'promote community inclusion in mineral development from inception to after-use so that local issues are understood and addressed' from the Third Stage Consultation MLP was removed from the Fourth Stage Consultation MLP. This was removed as WCC considered that this was not an objective which the plan itself can deliver, rather it is a best practice approach to development management by which other objectives will be delivered. However, the need for public consultation and the benefits of liaison committees are referenced throughout the MLP, although the plan cannot require community engagement. The assessment of the updated MLP objectives was presented in Chapter 5 of the November 2018 SA Report.
Spatial Strategy (Policies MLP 1 – MLP 8): Policy MLP 1: Strategic Location of Development Policy MLP 2: Borrow pits Policy MLP 3: Green Infrastructure Policy MLP 4: Avon and Carrant Brook Strategic Corridor Policy MLP 5: Lower Severn Strategic Corridor Policy MLP 6: North East Worcestershire Strategic Corridor Policy MLP 7: North West Worcestershire Strategic Corridor Policy MLP 8: Salwarpe Tributaries Strategic Corridor	Policies MLP 1 to MLP 8 were updated and refined to reflect recommendations of the SA and consultation responses on the Third Stage MLP. There were two new policies (Policies MLP 2 and MLP 3) which were added largely in response to consultation comments and recommendations of the SA. In addition, Policy MLP 2 was introduced to define borrow pits and provide a higher level of certainty on the types of development that would be acceptable outside of allocated sites. Policy MLP 3 incorporated some aspects that were in MLP 15 of the Third Stage MLP, but also helped to draw out the need to consider the local economic, social and environmental context of sites, climate change, and site-specific opportunities to contribute to the various green infrastructure components, as well as the strategic corridor priorities, and included provision to ensure that green infrastructure benefits will be secured for the long term.

Relevant section of the Fourth Stage Consultation MLP	Alternatives appraised
	Policies MLP 1 to MLP 8 were appraised in Appendix 5 of the SA Report and the findings summarised in Chapter 7 of the November 2018 SA Report.
Specific sites and preferred areas	These were no longer allocated in the Fourth Stage Consultation MLP and alternatives will be considered and appraised during preparation of the new DPD.
Areas of Search 167 Areas of Search covering: Building Stone Brick Clay Terrace and Glacial Sand and Gravel Solid Sand and Gravel Silica Sand	All reasonable options identified were included in the MLP, in order to provide flexibility and maximise opportunities for minerals development to come forward in the county. No further reasonable alternatives were identified. All of the Areas of Search were appraised in Appendices 7-11 of the November 2018 SA Report and the findings summarised in Chapter 6 of the November 2018 SA Report.
Steady and adequate supply of mineral resources (Policies MLP 9 to MLP 16): Policy MLP 9: Contribution of Substitute, Secondary and Recycled Materials and Mineral Waste to Overall Minerals Supply Policy MLP 10: Steady and Adequate Supply of Sand and Gravel Policy MLP 11: Steady and Adequate Supply of Crushed Rock Policy MLP 12: Steady and Adequate Supply of Brick Clay and Clay Products Policy MLP 13: Steady and Adequate Supply of Silica Sand Policy MLP 14: Adequate and Diverse Supply of Building Stone Policy MLP 15: Supply of Other Locally and Nationally Important Industrial Minerals Policy MLP 16: Supply of Energy Minerals	Policies MLP 9 to MLP 16 were updated and refined to reflect recommendations of the SA and consultation responses on the Third Stage MLP. Policies MLP 9 to MLP 16 were appraised in Appendix 5 of the November 2018 SA Report and the findings summarised in Chapter 7 of the November 2018 SA Report.
Development management (Policies MLP 17 to MLP 30): Policy MLP 17: Prudent Use of Resources Policy MLP 18: Green Belt Policy MLP 19: Amenity Policy MLP 20: Access and Recreation Policy MLP 21: Biodiversity Policy MLP 22: Historic Environment Policy MLP 23: Landscape Policy MLP 24: Soils Policy MLP 25: Best and Most Versatile Agricultural Land Policy MLP 26: Geodiversity Policy MLP 27: Water Quality and Quantity Policy MLP 28: Flooding Policy MLP 29: Transport Policy MLP 30: Planning Obligations	Policies MLP 17 to MLP 30 were updated and refined to reflect recommendations of the SA and consultation responses on the Third Stage MLP, to reflect changes in national policy, or to ensure consistency in the style of wording throughout the plan. Policy MLP 30 was an updated version of previous Policy MLP 26 of the Third Stage Consultation MLP. There were two new policies (Policies MLP 17 and MLP 18). Policy MLP 17 incorporated many of the points previously in MLP 15 of the Third Stage MLP, but strengthened requirements to balance the need for mineral resources with the need to achieve final landforms and restoration that delivered multifunctional benefits, which was highlighted in consultation responses to the Third Stage MLP. Policy MLP 18 was added in response to consultation comments and recommendations of the SA, and reflected national Green Belt policy, whilst expanding on how this related to minerals development. Previous Policy MLP 20 of the Third Stage Consultation MLP was spilt into two policies in the Fourth Stage MLP: to Policies MLP 24 and MLP 25, in order to ensure it was clear that all soil resources should be protected, not just those on high quality agricultural land. Previous Policy MLP 22 of the Third Stage Consultation MLP was split into Policies MLP 27 and MLP 28, to add clarity around each issue. Previous Policies MLP 24 and MLP 25 of the Third Stage MLP were combined within Policy MLP 29 of the

Relevant section of the Fourth Stage Consultation MLP	Alternatives appraised
	Fourth Stage MLP as WCC considered the majority of issues relating to transport within sites (such as impacts on amenity or landscape) to be sufficiently covered by other policies. Previous Policy MLP 15 of the Third Stage MLP was no longer in the Fourth Stage MLP, largely because its contents were covered by other policies, including Policy MLP 3, MLP 17 and MLP 19. Other policy points, such as reference to cumulative impact and unacceptable hazards, were covered elsewhere in the MLP, covered by other legislation, or were no longer considered sufficient to warrant policy coverage in the MLP. Policies MLP 17 to MLP 30 were appraised in Appendix 5 of the November 2018 SA Report and the findings summarised in Chapter 7 of the November 2018 SA Report.
Safeguarding minerals and supporting infrastructure: Policy MLP 31: Safeguarding Locally and Nationally Important Mineral Resources Policy MLP 32: Safeguarding Mineral Sites and Supporting Infrastructure	Policies MLP 31 to MLP 32 were updated and refined to reflect recommendations of the SA and consultation responses on the Third Stage MLP. Policies MLP 31 to MLP 32 were appraised in Appendix 5 of the November 2018 SA Report and the findings summarised in Chapter 7 of the November 2018 SA Report.

Publication Version

8.22 No additional reasonable alternatives were identified in preparing the Publication Version MLP, although the vision and some of the policies have been updated. **Table 8.4** summarises the revisions to the vision and policies considered in the preparation of the SA to accompany the Publication Version MLP.

Table 8.4 Alterations to the vision and policies in the Publication Version MLP that are assessed in this SA Report

Relevant section of the Fourth Stage Consultation MLP	Alternatives appraised
Vision	The vision was updated and refined to reflect recommendations of the SA and internal review of the plan. The assessment of the updated vision is presented in Chapter 5 of this SA Report.
Objectives	These have not changed from the previous version of the MLP. No additional alternatives were identified at this stage.
Spatial Strategy (Policies MLP 1 – MLP 8): Policy MLP 1: Strategic Location of Development Policy MLP 2: Borrow Pits Policy MLP 3: Green Infrastructure Policy MLP 4: Avon and Carrant Brook Strategic Corridor Policy MLP 5: Lower Severn Strategic Corridor Policy MLP 6: North East Worcestershire Strategic Corridor Policy MLP 7: North West Worcestershire Strategic Corridor Policy MLP 8: Salwarpe Tributaries Strategic Corridor	Minor updates were made to Policies MLP 1 to MLP 3. Policies MLP 4 to MLP 8 were updated and refined to require that proposals that deviate from strategic corridor priorities deliver specific local economic, social and/or environmental benefits either through or alongside appropriate multifunctional green infrastructure measures. The assessments of these updated policies are presented in Appendix 5 and summarised in Chapter 7 of this SA Report.
Specific sites and preferred areas	These are not included in the Publication version MLP and will be considered and appraised during preparation of the new DPD.
Areas of Search	All reasonable options identified were included in the MLP, in order to provide flexibility and maximise

Relevant section of the Fourth Stage Consultation MLP	Alternatives appraised
167 Areas of Search covering: Building Stone Brick Clay Terrace and Glacial Sand and Gravel Solid Sand and Gravel Silica Sand	opportunities for minerals development to come forward in the county. These have not changed since the Fourth Stage Consultation MLP and no further reasonable alternatives were identified.
Steady and adequate supply of mineral resources (Policies MLP 9 to MLP 16): Policy MLP 9: Contribution of Substitute, Secondary and Recycled Materials and Mineral Waste to Overall Minerals Supply Policy MLP 10: Steady and Adequate Supply of Sand and Gravel Policy MLP 11: Steady and Adequate Supply of Crushed Rock Policy MLP 12: Steady and Adequate Supply of Brick Clay and Clay Products Policy MLP 13: Steady and Adequate Supply of Silica Sand Policy MLP 14: Adequate and Diverse Supply of Building Stone Policy MLP 15: Supply of Other Locally and Nationally Important Industrial Minerals Policy MLP 16: Supply of Energy Minerals	Policies MLP 11, 12, 13 and 16 were updated and refined to reflect consultation responses on the Fourth Stage MLP and to ensure consistency in the style of wording throughout the plan. The assessments of these updated policies are presented in Appendix 5 and summarised in Chapter 7 of this SA Report.
Development management (Policies MLP 17 to MLP 30): Policy MLP 17: Prudent Use of Resources Policy MLP 18: Green Belt Policy MLP 19: Amenity Policy MLP 20: Access and Recreation Policy MLP 21: Biodiversity Policy MLP 22: Historic Environment Policy MLP 23: Landscape Policy MLP 24: Soils Policy MLP 25: Best and Most Versatile Agricultural Land Policy MLP 26: Geodiversity Policy MLP 27: Water Quality and Quantity Policy MLP 28: Flooding Policy MLP 29: Transport Policy MLP 30: Planning Obligations	Policies MLP 18 to MLP 30 were updated and refined to add clarity and reflect consultation responses on the Fourth Stage MLP, to reflect changes in national policy and to ensure consistency in the style of wording throughout the plan. The updated assessments of these policies are presented in Appendix 5 and summarised in Chapter 7 of this SA Report.
Safeguarding minerals and supporting infrastructure: Policy MLP 31: Safeguarding Locally and Nationally Important Mineral Resources Policy MLP 32: Safeguarding Mineral Sites and Supporting Infrastructure	Minor, grammatical updates were made to Policy MLP 31. Policy MLP 32 was updated to reflect consultation responses on the Fourth Stage MLP. The assessments of these updated policies are presented in Appendix 5 and summarised in Chapter 7 of this SA Report.

9 Cumulative Effects, Recommendations, Mitigation and Monitoring

9.1 This chapter draws on the findings of the SA set out in **Chapters 5-7** and describes the short, medium and long-term effects of the MLP along with the likely significant effects of the MLP as a whole, i.e. an assessment of cumulative effects as required by the SEA Regulations. The SA considers effects against the likely evolution of the baseline without the plan throughout, therefore this is inherently considered in the assessment of cumulative effects below and represents more than just the 'total' effects of the plan, as described in the RTPI Practice Advice[25]. For example, the appraisals have considered in-combination effects with the Local Plans of districts within Worcestershire, by taking into account allocated sites for housing and employment development. The appraisals have also considered potential in-combination effects with strategic infrastructure proposals, namely the dualling of Worcester's Southern link road and Worcestershire Parkway train station. A small number of recommendations for MLP policies have been made at previous stages of the SA to address issues that had been identified through the SA process, and these are summarised near the end of this chapter after the description of cumulative effects. No further recommendations have been made at this stage. The chapter concludes by setting out the potential mitigation provided by specific policies in the MLP for the likely significant effects identified, and the proposed indicators for monitoring the significant effects.

Short, medium and long-term effects

Short-term effects of the MLP

9.2 The impacts of the MLP in the short term are mostly related to the initial impacts of commencing minerals extraction, i.e. during site development/construction. This will include the removal of vegetation, top soil, sub soil, and provision of infrastructure required. Such works could have negative impacts on landscape (including historic landscape), biodiversity and geodiversity, material assets and health and amenity (possible disruption to rights of way, traffic flows, noise generation, vibration, dust etc.). The need to provide new infrastructure, construction of access roads and ancillary buildings and facilities may result in greater traffic movements in the short term. Whilst there will be increased traffic to and from a minerals site during the medium term, there is likely to be a greater effect in the construction phase, leading to negative effects for climate change and energy and traffic and transport. However, these impacts are temporary in nature and some may be minimised through good design, adherence to the policies in the MLP or reversed through restoration measures in the medium to long term. Physical damage to historic environment assets could take place in the short and medium terms.

9.3 In addition, safeguarding policies could have short-term negative effects on those SA objectives furthered by development taking place (especially 'growth with prosperity for all' and 'provision of housing'), as safeguarding could delay or even prevent such development occurring.

Medium-term effects of the MLP

9.4 Medium-term impacts are those related to the workings of minerals sites in the operational phase. Medium-term positive impacts relate to growth and prosperity for all (through employment opportunities) and provision of housing. Negative impacts in the medium-term include the implications of operational minerals extraction sites on landscape, climate change and energy,

[25] RTPI (2018) Strategic Environmental Assessment: Improving the effectiveness and efficiency of SEA/SA for land use plans

traffic and transport, cultural heritage, architecture and archaeology, access to services, health and amenity of local communities (e.g. noise, dust, increased traffic etc.). However, as mentioned above, these impacts should be avoided or mitigated through good practices by the minerals operators and adherence to all the policies in the MLP when planning proposals are assessed and determined by WCC.

Long-term effects of the MLP

9.5 Long-term effects are taken to mean those after final site restoration, and/or after the plan period has ended. Long-term, permanent benefits that would result from the MLP include the provision of sufficient minerals operations to meet Worcestershire's needs, including for housing development, especially as a result of safeguarding policies. Other long-term benefits include the provision of strategic green infrastructure, which could include potential flood alleviation, habitat creation and biodiversity enhancement, or recreation enhancement opportunities through the restoration of minerals working sites, or the incorporation and preservation of important geological features within sites. Long-term, permanent negative impacts of the MLP policies are potentially loss of habitats, areas of best and most versatile agricultural land; and the disturbance and/or removal of archaeological remains, some of which may be of national significance.

Cumulative Effects

9.6 **Table 7.1**, **Table 7.2**, **Table 7.3** and **Table 7.4** present a summary of the scores for all the policies set out in the Fourth Stage Consultation document and **Table 6.1**, **Table 6.2**, **Table 6.3**, **Table 6.4** and **Table 6.5** present a summary of the scores for all the areas of search included in the MLP. This section presents an assessment of the likely significant effects of the MLP as a whole, in relation to the likely future baseline i.e. an assessment of cumulative effects as required by the SEA Regulations.

SA Objective 1: Landscape

9.7 The vast majority of the areas of search will likely lead to a significant negative effect as the areas of search allocations are adjacent to AONBs and/or a number of receptors likely to be sensitive to landscape modifications and any coinciding visual impacts. These effects are uncertain as it depends on the exact scale, location and design of mineral development sites that come forward in these areas. These effects are likely to be exacerbated if several mineral sites are developed within close proximity of each other, and may have in-combination effects if any other large-scale developments come forward in the area.

9.8 Spatial Strategy Policies MLP 1-8 record both minor negative and positive effects since they require development to contribute to the quality, character and distinctiveness of the area, but allow minerals working that has the potential to adversely affect the local landscape. Mineral Supply Policies MLP 9-16 are expected to have mainly negative effects, due to the operations they facilitate and promote having the potential to adversely affect the local landscape. However, Development Management Policies MLP 17 (Prudent Use of Resources) and 23 (Landscape) generate significant positive effects against this objective due to the requirements they put in place to safeguard and strengthen landscape character and visual amenity for mineral activities. In addition, the MLP emphasises through a number of policies the need to create and enhance green infrastructure, which can be a strong contributor to landscape character and can help to minimise visual impacts of minerals development.

9.9 As such, the MLP is likely to result in a **cumulative mixed minor positive and minor negative effect** against this objective.

SA Objective 2: Biodiversity and Geodiversity

9.10 Most areas of search are expected to have significant negative effects on this SA objective. If several minerals sites were to come forward in a particular area, or if minerals sites come forward in proximity to other large-scale development, this could have cumulative effects on the biodiversity sites in that area, resulting in greater likelihood and magnitude of effects on these

sites. Development of a number of smaller sites can also adversely affect habitat integrity and wildlife corridors, depending on their nature and location.

9.11 Most policies are expected to have minor or significant positive effects with uncertainty in relation to this objective. Policy MLP 3 (Green Infrastructure) promotes the protection and enhancement of networks of green infrastructure throughout the life of the development. This policy could work in tandem with Policies MLP 21 (Biodiversity) and MLP 26 (Geodiversity) to have an overall positive effect, as they promote the protection, conservation and enhancement of geodiversity and biodiversity with the integration of other green infrastructure components where appropriate.

9.12 These three policies could also help to mitigate potential negative effects by ensuring that biodiversity and geodiversity are taken into account when making decisions on applications for minerals development. The Biodiversity section of the MLP highlights that mineral development can also provide an opportunity to create valuable habitats and enhance existing networks, primarily through site restoration, but also during site preparation and working. The MLP also puts a lot of emphasis on provision and enhancement of GI, which is expected to conserve, enhance and create habitats across the county.

9.13 It is considered unlikely that all impacts on biodiversity can be avoided and therefore there will be some degree of loss or degradation of biodiversity related to minerals development, at least in the short and medium terms. However, the Minerals Local Plan includes policies to provide mitigation for any loss and promote net gain, therefore positive effects are possible in the longer term, through restoration. As such, **cumulative mixed minor positive and minor negative effects** are expected with regards to SA objective 2.

SA Objective 3: Cultural heritage, architecture and archaeology

9.14 The majority of areas of search are expected to have significant negative effects with uncertainty for this SA objective. If several mineral sites came forward, or if minerals sites come forward in proximity to other large-scale development, next to an area with a relatively high concentration of historic assets (such as a Conservation Area containing multiple listed buildings) or a key historic environment asset for which the surrounding area forms an important setting, cumulative effects as a result of minerals extraction could occur. This increases the likelihood and magnitude of effects likely to occur on heritage assets located in/around the areas of search.

9.15 Around half of the policies are likely to have minor positive or significant positive effects for this SA objective. Policy MLP 3 (Green Infrastructure) and Policy MLP 22 (Historic Environment) are likely to work in combination to avoid and mitigate effects on heritage assets and their settings, as far as possible.

9.16 Policy MLP 23 (Landscape) is likely to work with Policy MLP 3 (Green Infrastructure) and Policy MLP 22 (Historic Environment) to have positive effects, as it is expected to help conserve the historic landscape and the settings of historic assets and settlements. These policies, along with the priorities for strategic corridors set out in Policies MLP 4 to MLP 8, could also help to enhance access to and understanding and enjoyment of the historic environment. Effects will remain uncertain, as there is always a risk of damage to undiscovered archaeological remains.

9.17 Overall, **cumulative minor positive uncertain** effects are expected.

SA Objective 4: Material assets

9.18 The majority of the areas of search are expected to lead to a minor negative effect as they are within the Green Belt and/or include Grades 2 or 3 agricultural land. Some may lead to loss of Grade 1 agricultural land, resulting in significant negative effects. Adverse effects on the Green Belt could be exacerbated if several sites come forward in the same area or if minerals sites come forward in proximity to other Green Belt development. However, the impacts of loss of best and most versatile agricultural land are likely to be additive, rather than synergistic.

9.19 In relation to SA objective 4, the Development Management policies are expected to result in a minor positive effect, as they include measures to minimise the potential impacts from minerals

development. For example, Policy MLP 17 (Prudent Use of Resources) requires the 'need to manage or mitigate impacts on the built, historic, natural and water environment and amenity'. In addition, Policies MLP 18, 24 and 25 seek to protect and enhance the best and most versatile agricultural land, soil resources and the Green Belt. On the contrary, all 'Supply of Mineral Resources' policies, except MLP 9 (Secondary & Recycled Materials) will lead to potential minor negative effects, as these policies allow for a supply of different types of minerals to come forward, which encourages primary extraction that could lead to adverse effects on best and most versatile agricultural land and/or Green Belt.

9.20 Policies MLP 31 and MLP 32 specifically relate to safeguarding minerals reserves, which will have significant positive effects on this SA objective.

9.21 Many of the potential effects are uncertain as they depend on the scale and location of mineral extraction sites. Due to the nature of minerals extraction, it is not likely impacts on the Green Belt and the best and most versatile agricultural land can be avoided entirely. Overall, a **cumulative significant positive and minor negative effect** is recorded.

SA Objective 5: Natural resources

9.22 The majority of the areas of search will likely lead to an uncertain significant negative effect, as the areas are situated adjacent to a waterbody, sensitive receptor and/or AQMA or within a Source Protection Zone. These effects are also likely to be exacerbated if several minerals sites go ahead within the same area or around a particular settlement, or if minerals sites come forward in proximity to other large-scale development.

9.23 Spatial strategy policies are generally likely to have significant negative uncertain effects (some mixed with minor positive effects). Mineral Supply policies tend to have minor negative effects, whereas the DM policies tend to have minor positive effects and the safeguarding policies have a mix of the two. Negative effects generally relate to impacts on water quality, including where development may occur within a Source Protection Zone. However, depending on the site proposal and green infrastructure provision, there may be opportunities to protect the quality of watercourses.

9.24 A number of policies are likely to lead to a positive effect, such as Policies MLP 17, 19, 27, 28, and 29 as they play a role in mitigating the negative impacts on water and air quality and could improve these in the long term.

9.25 Overall, the mitigation provided by policies in the MLP is expected to mitigate any potential adverse effects on air and water quality and may help to improve these in the long term. Therefore, a **cumulative minor positive effect** is recorded.

SA Objective 6: Climate change and energy

9.26 Most of the areas of search are expected to have a minor negative effect on this SA objective, as they are likely to require the use of fossil-fuelled heavy vehicle haulage. This could have cumulative effects on climate change and energy, such as by increasing CO_2 emissions due to traffic congestion, particularly if multiple sites come forward that use the same transport routes or other development comes forward in the area, particularly employment development that generates HGV movements. Most other areas of search are expected to result in minor positive uncertain effects, as these have a water link that runs through or adjacent to the area, which could provide a sustainable mode of transport. However, this is uncertain, as it will depend on loading/unloading facilities and route availability between source and destination.

9.27 Most policies are expected to have a minor positive, mixed minor positive and negative effect with uncertainty or negligible/no effect on this SA objective. Policy MLP 17 (Prudent Use of Resources) promotes the sustainable use of water and energy and requires on-site energy generation from renewable and low-carbon sources to be optimised. This could work in tandem with Policy MLP 3 (Green Infrastructure), which promotes the protection and enhancement of networks of green infrastructure throughout the life of the development, and Policy MLP 28 (Flooding) which promotes the resilience of people and property on site or elsewhere to flood risk, with an

additional consideration of climate change, to have an overall mixed positive and negative effect with uncertainty.

9.28 Provision and enhancement of GI is a strong theme in the MLP, which is expected to help mitigate potential negative effects by ensuring that adverse effects of climate change, such as increased flooding, are avoided or reduced.

9.29 It is considered unlikely that all impacts on climate change and energy can be avoided and therefore there will be some degree of increased CO_2 emissions related to minerals development. However, development management policies are expected to promote sustainable waste and energy use. As such, **cumulative mixed minor positive and minor negative effects** are expected with regards to SA objective 6.

SA Objective 7: Flooding

9.30 The majority of the areas of search are expected to have a negligible effect on this SA objective, as all sand and gravel based mineral extraction (and associated infrastructure) will have a negligible effect on flooding. All other areas of search (for non-sand and gravel based minerals) could result in development occurring in high-risk flood prone areas and contributing to fluvial and surface flooding, which could put properties at risk of flooding, particularly if several workings for non-sand and gravel based minerals came forward in one area or if minerals sites come forward in proximity to other development that could increase flood risk.

9.31 Most policies are expected to have a minor positive or minor negative effect with uncertainty or negligible/no effect on this SA objective. Policy MLP 28 (Flooding) promotes the resilience of people and property on site or elsewhere to flood risk, with an additional consideration of climate change and could work together with Policy MLP 27 (Water Quality and Quantity) which promotes the protection and enhancement of quality, quantity and flow of surface water and groundwater resources and the strong support for GI provision and enhancement throughout the plan (including Policy MLP 3).

9.32 Policy MLP 28 (Flooding), Policy MLP 27 (Water Quality and Quantity) and Policy MLP 3 (Green Infrastructure) could help to mitigate potential negative effects and improve flood risk management by building resilience to flood risk.

9.33 Overall, the mitigation provided through policies is expected to be sufficient to ensure flood risk is not exacerbated by the MLP and may contribute to improved flood management, therefore **cumulative minor positive effects** are expected with regards to SA objective 7.

SA Objective 8: Access to services

9.34 For this SA objective, the majority of areas of search are likely to have significant negative effects with uncertainty. If multiple mineral sites came forward within areas of search in close proximity to settlements, there could be an increased likelihood of minerals extraction creating a physical barrier and/or diverting or severing Public Rights of Way. This may significantly compromise the ability of people to access these services. This could be further exacerbated if minerals development comes forward in proximity to other development that could create a physical barrier or require re-routing of public rights of way.

9.35 The majority of policies are likely to have mixed, negligible or no impact for this SA objective. Policy MLP 20 (Access and Recreation) is expected to have significant positive effects by ensuring that rights of way and public access provision are protected and enhanced should minerals extraction sites come forward. The strong support for GI throughout the MLP is expected to work with Policy MLP 20 to conserve and enhance active travel links, although it is not considered likely that these will significantly enhance access to services.

9.36 In addition, Policy MLP 21 (Biodiversity), Policy MLP 28 (Flooding) and Policy MLP 29 (Transport) by ensuring that the any mineral sites that come forward take full consideration of the environmental setting they are in and its transport links, reduce the potential for people's ability to access services to be compromised.

9.37 Overall, a **cumulative negligible effect** is expected in relation to SA objective 8.

SA Objective 9: Health and amenity

9.38 The majority of the areas of search will likely lead to a significant negative effect, as they are generally within close proximity of sensitive receptors that could be affected by air pollution, noise and other emissions, including existing residential areas and areas allocated for housing in district Local Plans. These effects are likely to be exacerbated if several minerals sites come forward around a particular settlement. Effects are uncertain as it will depend on the scale, location and design of the extraction sites.

9.39 Spatial strategy and safeguarding policies are generally likely to have mixed effects on this SA objective. This includes significant positive effects for most strategic corridors, as one of the green infrastructure priorities is to provide accessible semi-natural greenspace. Mineral supply policies are likely to have minor negative uncertain effects and DM policies are likely to have negligible/no effect or a minor positive effect. In the short term, impacts on health are likely to be negative as mineral extraction could lead to increased traffic, noise and emissions that could compromise health. However, the MLP will mitigate these to some extent through other policies such as Policy MLP 19 (Amenity). In addition, Policy MLP 20 (Access and Recreation) and the emphasis of the plan on provision and enhancement of GI, are likely to have a significant positive effect on health, as publicly accessible greenspace encourages a healthy lifestyle through outdoor exercise and recreation.

9.40 It is also possible that minerals developments may improve health and amenity in the long term through the delivery of green infrastructure, enhanced public rights of way, or improved access to recreation as part of the development or restoration of sites.

9.41 The MLP is expected to lead to mineral extraction that is well operated, and mitigation measures implemented should be sufficient to avoid any potential adverse, long-term effects on health and local amenity and may provide new areas for recreation in the long term. Overall, a **cumulative minor positive effect** is expected.

SA Objective 10: Waste

9.42 The majority of the areas of search are expected to have no effect with a few areas of search expected to have minor negative effects on this SA objective. If minerals development comes forward within close proximity to waste sites, this could restrict operations and expansion of the waste site and have cumulative adverse effects on a range of sustainability factors, including increased traffic levels and associated emissions and health and amenity in that area.

9.43 Most policies are expected to have a negligible or a mixed minor positive and minor negative effect with uncertainty on this SA objective. Policy MLP 9 (Secondary & Recycled materials) promotes development which would contribute to the overall sustainable supply of materials and thereby reduce the overall need for the extraction of primary minerals.

9.44 Overall, the Minerals Local Plan is expected to have **cumulative negligible effects** on SA objective 10.

SA Objective 11: Traffic and transport

9.45 Most areas of search are expected to have a minor negative effect on this SA objective, whilst some are expected to have minor positive uncertain effects. Positive effects are associated with areas of search that have a water link that runs through or adjacent to the area, which could provide an alternative sustainable mode of transport although this is uncertain, as it will depend on loading/unloading facilities and route availability between source and destination. However, development in other areas of search will require road-based movement by HGVs. This could have cumulative effects on traffic and transport, such as increased CO_2 emissions as a result of increased traffic congestion, particularly if multiple sites come forward that use the same transport routes or other development comes forward in the area, particularly employment development that generates HGV movements.

9.46 Most policies are expected to have a minor positive or minor negative effect with uncertainty or no/negligible effect on this SA objective. Policy MLP 29 (Transport) promotes mineral

development that uses the most sustainable transport options and which will not have an unacceptable adverse effect on transport safety or congestion. This policy could help to mitigate potential negative effects by ensuring that the need to travel is reduced. In addition, policies that seek to protect and enhance public rights of way, including Policies MLP 3, MLP 20 and the GI theme running through the plan, may help to encourage residents to travel by sustainable modes of transport. However, the effect of this on traffic is likely to be limited, as the MLP will not necessarily help to provide links that are well related to key destinations.

9.47 Overall, the Minerals Local Plan is expected to have **cumulative minor negative uncertain effects** on SA objective 11.

SA Objective 12: Growth with prosperity for all

9.48 The vast majority of areas of search are likely to have a minor positive effect on this objective as minerals development will provide employment opportunities. However, the presence of multiple minerals development sites in close proximity to areas allocated for employment development or existing employment sites could produce cumulative adverse effects on employment which may outweigh the potential benefits of any increased employment through mineral extraction.

9.49 Around half of the policies (mainly DM policies) are likely to have negligible or no effects on this objective. Spatial strategy and safeguarding policies are generally expected to have mixed positive and negative effects and Mineral Supply policies are likely to have minor positive effects. There is potential for Policy MLP 19 (Amenity) to work in combination with Policy MLP 3 (Green Infrastructure) and Policy MLP 29 (Transport) to ensure that employment areas and their connecting transport links are protected from potential adverse effects of minerals development.

9.50 Overall, the MLP is expected to provide new employment opportunities and raw materials for use in construction and industry, therefore a **cumulative minor positive effect** is expected.

SA Objective 13: Provision of housing

9.51 Almost half of the areas of search are likely to have a minor positive effect on the provision of housing, as they could provide minerals used in housing construction. The remaining areas of search are likely to have mixed minor positive and minor negative effects or no impacts on the SA objective. If multiple sites for minerals development came forward in close proximity to areas allocated for housing, this could increase the likelihood of the residential amenity of development (or existing housing) being adversely affected.

9.52 The majority of policies are likely to have a positive effect on this SA objective. It is likely that Policy MLP 23 (Landscape) and Policy MLP 19 (Amenity) will work in combination to ensure that residential amenity of developments and existing housing are maintained and enhanced, should mineral sites come forward.

9.53 There is also potential for Policy MLP 10 (Sand and Gravel), Policy MLP 11 (Crushed Rock) and Policy MLP 12 (Brick Clay) to work in combination to ensure minerals development is justified by providing and enhancing Worcestershire's productive capacity for minerals that would contribute to housing construction.

9.54 Overall, a **cumulative minor positive effect** is expected.

SA Objective 14: Participation by all

9.55 None of the areas of search or policies are likely to have an effect on participation by all.

9.56 Overall, the Minerals Local Plan is expected to have **no effect** on this SA objective.

SA Objective 15: Technology, innovation and inward investment

9.57 All of the areas of search and most of the policies are likely to have no effect on technology, innovation and inward investment, although a small number of policies could have minor positive effects. These are mixed with minor negative effects for the safeguarding policies.

9.58 Overall, the Minerals Local Plan is expected to have a **cumulative negligible effect** on this SA objective.

SA Objective 16: Population (skills and education)

9.59 Most policies and areas of search are unlikely to have any direct effects on this SA objective. However, minerals working can reveal previously unknown archaeology or geodiversity features, which could provide opportunities for learning. In addition, the strategic corridor policies, Policies MLP 4 to MLP 8, all include a priority to incorporate information or routes that will increase the legibility and understanding of the geodiversity, heritage and character of the area, which is expected to promote access to and understanding of the historic environment and local geodiversity.

9.60 As such, overall **cumulative minor positive effects** are expected.

SA Objective 17: Population (crime & fear of crime)

9.61 None of the areas of search or policies are likely to have an effect on population (crime & fear of crime).

9.62 Overall, the Minerals Local Plan is expected to have **no effect** on this SA objective.

Recommendations

9.63 The Fourth Stage SA Report made recommendations to address issues that had been identified through the SA process. **Table 9.1** lists the recommendations made in the SA of the Fourth Stage Consultation MLP and the Council's response to these. No further recommendations have been made at this stage.

Table 9.1: Recommendations made in the Fourth Stage SA Report and the Council's response to these

Recommendation	Taken forward?	Worcestershire County Council's response
The Vision could make reference to supporting renewable energy provision within minerals development.	Yes	The vision now refers to optimising energy provision from renewable and low-carbon sources.
Policy MLP 29 (Transport) could make reference to supporting new technologies, such as electric vehicles.	No	Policy MLP 29 seeks the use of the most sustainable transport options, prioritising the use of alternatives to road transport for the movement of minerals and materials unless other modes are not practicable or not environmentally preferable. Using alternatives to road transport would help to address congestion and road safety, as well as emissions. Paragraph 6.136, bullet point 6 of the MLP refers to the need for infrastructure to be incorporated to enable sustainable transport, including charging facilities for electric vehicles. The Council considers this to be sufficient.
The MLP could make reference to ensuring that minerals development does not limit the ability of waste sites to carry out their	No	The Council does not consider this appropriate or necessary. The Minerals Local Plan will form part of the development plan alongside the adopted Waste Core Strategy. The Waste Core Strategy includes Policy WCS 16 which safeguards existing

operations or restrict opportunities to expand sites for sustainable waste management (such as recycling plants).		waste management facilities from non-waste-related uses. The planning balance of the need to safeguard or enable waste management facilities and the need to safeguard or enable mineral development would need to be weighed at the time of a planning application. It is considered that changing the plan to include this could undermine the safeguarding requirements of the Minerals Local Plan if it were to state that minerals development should not limit waste management facilities, and there is no justification for stating this in relation to waste management facilities over any other form of development.

Mitigation and Monitoring

9.64 The SEA Regulations require that "member states shall monitor the significant environmental effects of the implementation of each plan or programme with the purpose of identifying unforeseen adverse effects at an early stage and being able to undertake appropriate remedial action" (Regulation 17(1)) and that the environmental report should provide information on "a description of the measures envisaged concerning monitoring" (Schedule 2 (9)). Negative effects should be addressed in line with the mitigation hierarchy: avoid effects where possible, reduce the extent or magnitude of effects, and then seek to mitigate any remaining effects. Monitoring proposals should be designed to provide information that can be used to highlight specific issues and significant effects, and which could help decision-making.

9.65 A number of the policies and spatial options included in the MLP could have potential significant positive or negative effects on the SA objectives. Therefore, it is recommended that monitoring is undertaken to determine whether these effects do indeed occur due to implementation of the MLP, and in order to seek to remedy or reverse any negative effects and to secure and maximise any positive effects. **Table 9.2** summarises the negative effects that could arise in relation to each SA objective, how these could be mitigated and how these should be monitored.

9.66 The sustainability impacts arising from implementation of the MLP will primarily be monitored through a series of existing monitoring regimes. Monitoring will be carried out by WCC as part of the Minerals and Waste Local Development Framework Authority Monitoring Report (AMR). The AMR will be used to record the results of the comprehensive policy review process and monitoring schedules set out in chapter 8 of the Publication Version MLP, which covers all of the MLP's objectives.

9.67 Other agencies also have a role to play in monitoring various issues related to the plan. The Environment Agency and Worcestershire Regulatory Services, for example, may monitor the compliance of minerals sites with environmental permits and regulations.

9.68 The SA process includes specific monitoring indicators that help to identify sustainability impacts. These are sometimes more general than the dedicated minerals indicators set out in the MLP, and help to build a fuller picture of sustainability in Worcestershire. These indicators are drawn from a wide range of datasets, including district council Annual Monitoring Reports, and data produced by the Office for National Statistics and government departments. Some of the SA indicators may have less direct relevance to the MLP than others, but they can help to identify social, environmental and economic trends that, if not necessarily caused by the MLP, could nevertheless be affected by changes in MLP policy and approach.

9.69 In line with the PPG, Chapter 8 of the MLP notes that "While the Minerals Local Plan looks forward to 2035, an assessment will be undertaken at least once every five years from the date of adoption to determine whether any policies need updating, taking account of any changes to local circumstances and national policy, particularly with regard to those policies which address

strategic priorities. The Authority Monitoring Report will be the primary tool to provide the evidence for this assessment".

Table 9.2: Potential negative effects of the MLP, potential mitigation measures and monitoring indicators

SA Objective	Potential negative effects	Mitigation	Potential monitoring indicators
SA Objective 1: Landscape	Adverse landscape and visual impacts could arise through creation of new workings, such as quarries, and associated infrastructure, and also through storing of arisings.	Policy MLP 3 (Green Infrastructure), Policy MLP 17 (Prudent Use of Resources), Policy MLP 18 (Green Belt), Policy MLP 19 (Amenity) and Policy MLP 23 (Landscape), should help to ensure that any landscape and visual impacts are taken into account.	• Percentage of Total New Homes Built on Brownfield Land • Condition of the Landscape • Planted ancient woodland sites restored to native woodland
SA Objective 2: Biodiversity and Geodiversity	Minerals development could lead to direct loss of habitats as a result of minerals workings. Minerals workings could also adversely affect habitats and species through increased noise, light and visual disturbance, as well as increased levels of air pollution and particulates.	Policy MLP 3 (Green Infrastructure), Policy MLP 21 (Biodiversity) and Policy MLP 26 (Geodiversity), should help to ensure that biodiversity and geodiversity are taken into account.	• Condition of European nature conservation sites • Extent and condition of SSSIs • Number of permitted developments coinciding with, or adjacent to, a designated site
SA Objective 3: Cultural heritage, architecture and archaeology	Minerals development could lead to direct loss of historic assets, including damage to archaeological remains. Development could also adversely affect the settings of heritage assets.	Policy MLP 3 (Green Infrastructure) and Policy MLP 22 (Historic Environment) and Policy MLP 23 (Landscape), should help to ensure that the historic environment is taken into account.	• Number of grade I and II* listed buildings 'at risk' • Proportion of undesignated heritage assets at risk • Number of permitted developments coinciding with, or adjacent to, a designated site
SA Objective 4: Material assets	Minerals development could lead to the direct loss of the Green Belt and agricultural land.	Policy MLP 3 (Green Infrastructure), Policy MLP 17 (Prudent Use of Resources), Policy MLP 18 (Green Belt), Policy MLP 24 (Soils) and Policy MLP 25 (Agricultural Land), should help to ensure that material assets are taken into account.	• Amount of land falling within Agricultural Land Classifications (hectares) • Hectares of Green Belt land • Number of permitted developments that would compromise the purposes of the Green Belt • Number of non-mineral developments permitted which would sterilise locally or nationally important minerals resources, sites or supporting infrastructure
SA Objective 5: Natural resources	Minerals development could lead to the pollution of water sources	Policy MLP 3 (Green Infrastructure), Policy MLP 17	• Number of Air Quality Management Areas (AQMAs) in Worcestershire

SA Objective	Potential negative effects	Mitigation	Potential monitoring indicators
	as a result of mineral workings. The plan could also exacerbate air quality issues in AQMAs due to increased heavy vehicle traffic and associated air pollution.	(Prudent Use of Resources), Policy MLP 19 (Amenity), Policy MLP 27 (Water Quality and Quantity), Policy 28 (Flooding) and Policy 29 (Transport) are expected to mitigate potential negative effects arising in relation to natural resources.	• Proportion of watercourses meeting 'good' status. • Water resource availability • Hectares of potentially contaminated land in Worcestershire • Annual production of land-won aggregates (sand and gravel) • Annual production of land-won aggregates (crushed rock)
SA Objective 6: Climate change and energy	Opportunities to develop renewable and low-carbon energy on a minerals area of search could be limited by the need to protect and enhance environmental assets, such as landscape or the historic environment. In addition, minerals development could lead to increased CO_2 emissions if there are no alternative sustainable means of transport within or adjacent to the area. The risk of flooding could also be increased as the effects of climate change intensify.	Policy MLP 17 (Prudent Use of Resources), Policy MLP 27 (Water Quality and Quantity), Policy MLP 3 (Green Infrastructure) and Policy MLP 28 (Flooding) are expected to ensure that climate change is mitigated and energy efficiency is promoted. Policy MLP 29 (Transport) could make reference to supporting new technologies, such as electric vehicles.	• CO2 emissions per capita • Total CO_2 emissions by local authority • Total final energy consumption by local authority (GWh)
SA Objective 7: Flooding	Depending on the type of mineral being extracted, the MLP will mostly likely have a negligible effect. However, for non sand and gravel based minerals, development could occur in high-risk flood prone areas and contribute to fluvial and surface flooding, which could put properties at risk of flooding.	Policy MLP 28 (Flooding), Policy MLP 27 (Water Quality and Quantity) and Policy MLP 3 (Green Infrastructure) are expected to ensure that development is resilient to flood risk, and does not increase flood risk for people and property.	• Properties at risk of flooding
SA Objective 8: Access to services	Minerals development could restrict access to vital services by severing or reducing rights of way, or creating a physical barrier therefore compromising the	Policy MLP 3 (Green Infrastructure) and Policy MLP 20 (Access and Recreation) are expected to ensure that rights of way and public access provision	• Satisfaction rates with minerals and waste planning policy consultation

SA Objective	Potential negative effects	Mitigation	Potential monitoring indicators
	ability of people to access health, educational or other key local services.	are protected and enhanced.	
SA Objective 9: Health and amenity	Minerals development could adversely affect the health of persons that live or work in close proximity to an area of search through air pollution and particulates and noise, dust or other emissions. The plan could also lead to loss of or disturbance to recreational opportunities, PROWs and outdoor leisure and recreation facilities.	Policy MLP 3 (Green Infrastructure), Policy MLP 18 (Green Belt), Policy MLP 19 (Amenity) and Policy MLP 20 (Access and Recreation) are expected to ensure that health and amenity are protected and improved.	• Proportion of population in each ONS general health category • Number of formal complaints regarding loss of amenity due to minerals development.
SA Objective 10: Waste	Minerals development could adversely affect waste site operations, by limiting operation and expansion of the waste site. Minerals development and waste sites in close proximity could have cumulative negative effects on a range of sustainability factors, including traffic levels and associated emissions and health and amenity.	Policy MLP 9 (Secondary & Recycled Materials) and Policy MLP 24 (Soils) are expected to encourage use of recycled materials and soils. See also mitigation for other SA objectives where minerals and waste sites could have in-combination effects on environment or amenity. The MLP could make reference to ensuring that minerals development does not limit the ability of waste sites to carry out their operations or restrict opportunities to expand sites for sustainable waste management (such as recycling plants).	• Household waste produced per head of population • Percentage/Amount of household waste recycled or composted
SA Objective 11: Traffic and transport	Minerals development could lead to increased traffic congestion and increased CO_2 emissions if there are no opportunities for non-road based transport within or adjacent to the area of search.	Policy MLP 29 (Transport) is expected to promote transport of minerals by sustainable means, where possible.	• Method of travel to work. • CO2 emissions in the county per capita arising from road transport

SA Objective	Potential negative effects	Mitigation	Potential monitoring indicators
SA Objective 12: Growth with prosperity for all	Minerals development could lead to an adverse effect on areas allocated for employment development. In addition, minerals development could adversely affect existing employment sites in terms of the wellbeing and amenity of those visiting or working at nearby employment sites.	Policy MLP 3 (Green Infrastructure), Policy MLP 19 (Amenity) and Policy MLP 29 (Transport) are expected to help ensure amenity at employment sites is not compromised by minerals development. The safeguarding policies (MLP 31 and MLP 312) are expected to help ensure that minerals development does not prevent employment allocations coming forward and vice versa.	• Average Worcestershire household income • Percentage employment rate (working age) • GVA per hour worked in Worcestershire
SA Objective 13: Provision of housing	Minerals development could lead to a negative effect on areas allocated for the provision of housing by compromising residential amenity.	Policy MLP 23 (Landscape) and Policy MLP 19 (Amenity) are expected to help ensure residential amenity is maintained. The safeguarding policies (MLP 31 and MLP 312) are expected to help ensure that minerals development does not prevent housing allocations coming forward and vice versa.	• New affordable homes built per year
SA Objective 14: Participation by all	No potential negative effects were identified.	No mitigation necessary.	• MLP consultation response rates
SA Objective 15: Technology, innovation and inward investment	No potential negative effects were identified.	No mitigation necessary.	• Number of new business enterprises
SA Objective 16: Population (skills and education)	No potential negative effects were identified.	No mitigation necessary.	• Population estimates • Demographic breakdown of population
SA Objective 17: Population (crime & fear of crime)	No potential negative effects were identified.	No mitigation necessary.	• Crimes per 1,000 people • Perceptions of anti-social behaviour

10 Conclusions

10.1 The policies and allocations included in the Publication Version MLP have been subject to a detailed appraisal against the SA Objectives, which were developed at the Scoping stage of the SA process and refined in previous stages of SA.

10.2 The MLP provides well-reasoned proposed policies and a clear guide to minerals development based on sound sustainable development principles. In general, the MLP has been found to have a wide range of positive effects on the SA Objectives, along with some negative effects. The majority of negative effects are associated with potential minerals development that may come forward within the areas of search. By the nature of their being broad areas within which minerals development could come forward, many areas of search contain, or are in close proximity to, receptors that could be adversely affected by minerals development. However, many of these effects are uncertain, as the likelihood of and severity of these effects will depend very much on the exact location, scale and design of minerals developments pursued. In addition, many potential positive effects expected will depend on how well policy requirements from the Minerals Local Plan are implemented, and the type of restoration achieved at minerals sites. The policies in the MLP are expected to mitigate most of the adverse effects that could arise from minerals development and as such no cumulative significant negative effects are expected as a result of the MLP as a whole, or in combination with other planned development in the county. In addition, a cumulative significant positive effect is expected from the MLP because Policies MLP 31 and MLP 32 specifically relate to safeguarding minerals reserves and the Development Management policies include measures to minimise the potential impacts from minerals development. As such, the MLP directly addresses the part of SA objective 4 that seeks to 'ensure efficient use of land through safeguarding of mineral reserves'. It is expected that most minerals development coming forward under the MLP would have a mix of positive and negative effects, although negative effects are more likely to occur in the short and medium term, with positive effects expected in the longer term, providing sites are restored in line with the MLP. The Fourth Stage Consultation MLP has a strong emphasis on green infrastructure, which is expected to result in positive effects on a range of sustainability factors, including helping Worcestershire to adapt to the effects of climate change and providing opportunities for residents to live healthier lives.

10.3 The SA has inevitably had to make assumptions in coming to judgements of the effects of the MLP. Our assumption with respect to effects, cumulative or otherwise, is on the basis of the intention of the MLP (i.e. what it is trying to achieve). Past experience suggests that, when considering development proposals, there will often be tensions when applying different policies, and deciding where weight should apply. Despite the best intentions of the planning authority, it may not always be possible to deliver development that meets all policy criteria and good practice guidance, and difficult choices will often have to be made. This highlights the importance of monitoring the potential significant effects identified once the MLP is adopted.

Next Steps

10.4 This SA Report will be available for consultation alongside the Publication Version MLP document, from 19th August 2019 to 30th September 2019.

10.5 Following the consultation on the Publication Version MLP, the Council will consider whether to propose any modifications to the Publication Version MLP. The Publication Version MLP, any proposed modifications to this, other supporting and submission documents, including the SA and responses received during the consultation, will be submitted to the Secretary of State for Examination.

LUC

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