ES Addendum

Proposed sand and gravel quarry with progressive restoration using site derived and imported inert material to agricultural parkland, public access and nature enhancement

PLANNING APPEAL REF: 19/000053/CM)

PLANNING APPEAL REF: APP/E1855/W/22/3310099

July 2024

CONTENTS

APPENDICES

1 Introduction

1.1 Purpose and Scope of this Addendum

1.1.1 This Addendum has been prepared to accompany the submission of information relating to the change to the proposed mineral processing plant to one of a smaller size, and with a reduced operational acoustic volume, compared to that proposed and assessed within the original application scheme. This has allowed for the reduction in the number, height and / or duration of temporary soil storage / screening bunds and minimising the time when quarry operational land is required.

1.1.2 Apart from the above changes, all other elements of the proposed development remain the same as set out in the Revised Statement of Common Ground - Signed 15.02.23 (CD13.27).

A total of circa 3 million saleable tonnes of sand and gravel will be extracted across an initial works period and five subsequent phases over the course of approximately 10 years. The mineral comprising circa 1.57 million tonnes of sand and gravel and 1.43 million tonnes of solid sand. The mineral will be transported to the plant site for processing utilising both dump trucks and a conveyor system. This scheme has been designed based on an annual processed tonnage of 300,000 saleable tonnes.

The development will also include the restoration and enhancement of the site/local landscape setting and green infrastructure. A new agricultural parkland will be designed with the provision of an agricultural parkland, provision of approximately 2.3km of new routes of public footpaths, cycleways, bridleways and pocket parks. Native woodland blocks will be re-established to reflect previous social historic land uses, hedges will be strengthened, and new acidic species rich meadow grassland will be created.

To aid in this process c. 60,000 m3 of inert material will be imported onto site per annum, c. 600,000 m3 in total, to help create restoration formation levels onto which the original site soil profile will be placed. The Western Area of the site is proposed to be fully restored within 5 years of extraction commencing, with the Eastern Area restoration being fully completed within one year after the cessation of mineral extraction.

1.1.3 This Addendum therefore provides an update to the findings of the original Environmental Statement (ES) and associated Regulation 25 submissions prepared for Planning Application Ref: 19/000053/CM and Appeal Ref: APP/E1855/W/22/3310099. It has been prepared in accordance with The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

1.2 ES Considerations

1.2.1 This Addendum has been produced to review the conclusions of the Original ES taking into

account the change to the proposed mineral processing plant to one of a smaller size, and with a reduced operational acoustic volume. The Addendum is focused on particular topics of relevance, namely:

- Description of Proposals – Chapter 2;
- Alternatives – Chapter 3;
- Landscape and Visual Impact – Chapter 4;
- Noise – Chapter 5;
- Air Quality and Dust – Chapter 6;
- Archaeology and Cultural Heritage – Chapter 7;
- Climate Change – Chapter 8;
- Cumulative Impact Assessment – Chapter 9; and
- Conclusions – Chapter 10.

1.2.2 There is no change to conclusions of the other topics presented in the Original ES, as summarised by Table 1 below.

Table 1: Summary of 2019 ES Chapter changes (Source: Kedd Limited)

2020 ES Chapter	Status
1. Introduction	Changes Reflected in Introduction and Amended Description of Proposals
2. Site Context	Not Changed
3. Statement of Community Involvement	Not Changed
4. Description of Proposals	Updated as per Chapter 2 of this Report
5. Environmental Impact Assessment	Not Changed
6. Alternatives	Updated as per Chapter 3 of this Report
7. Landscape and Visual Impact	Updated as per Chapter 4 of this Report
8. Ecology and Biodiversity	Not Changed
9. Arboriculture	Not Changed
10. Noise	Updated as per Chapter 5 of this Report
11. Air Quality and Dust	Updated as per Chapter 6 of this Report
12. Transport A Movement and Access	Not Changed
13. Agricultural Land Classification and Soils	Not Changed
14. Archaeology and Cultural Heritage	Updated as per Chapter 7 of this Report
15. Water Environment	Not Changed

16. Rights of Way	Not Changed
17. Lighting	Not Changed
18. Climate Change Adaption	Updated as per Chapter 8 of this Report
19. Leisure and Recreation	Not Changed
20. Health Impact Assessment	Not Changed
21. Socio Economic Assessment	Not Changed
22. Cumulative Impact Assessment	Updated as per Chapter 9 of this Report
23. Conclusions	Updated as per Chapter 10 of this Report

1.3 The ES Addendum Project Team

1.3.1 The EIA has been undertaken by Liam Toland Planning in partnership with other specialist consultants as listed below:

Planning and Management of Environmental Impact Assessment – Liam Toland Planning

The preparation and submission of the Addendum Environmental Statement, Addendum Non-Technical Summary and revised plans have been carried out by Liam Toland Planning. The team has worked on and developed planning applications for mineral and imported restoration materials sites for both large and small schemes and for a wide variety of clients and operators throughout the UK.

Landscape and Visual Impact – Neil Furber (Pegasus Group)

The Landscape and Visual Assessment Addendum has been undertaken by Neil Furber BSc (Dual Hons) Dip LA CMLI, a Landscape Director at Pegasus Group. Neil was the author of the Landscape Proof of evidence for the original Lea Castle Quarry scheme, whilst employed at HCUK Ltd.

Neil has over 25 years' experience in the design and assessment of mineral and waste proposals and has acted as a landscape expert witness for both developers and planning authorities for the last 20 years.

Noise – Rachel Canham (Walker Beak Mason Limited (WBM))

Rachel Canham is a director of Walker Beak Mason Limited (WBM), which is an independent acoustic consultancy that deals with environmental assessments, architectural and building acoustics, and planning application and appeals work. WBM is a member of the Association of Noise Consultants and is an Associate Assessor Member of the Institute of Environmental Management and Assessment.

Air Quality and Dust – Katrina Hawkins (Smith Grant LLP)

Katrina Hawkins is a Chartered Environmentalist, a Member of the Institute of Air Quality

Management, a Member of the Institute of Environmental Sciences and a Member of the Institute of Environmental Management and Auditing. Katrina has been in practice as an environmental consultant for over 25 years specialising in air, land and water pollution.

Cultural Heritage – Robert Sutton (Cotswold Archaeology)

The Assessment of the Appeal Scheme's effect on cultural heritage, has been undertaken by Robert Sutton BSc (Hons), MCIfA, Director of Heritage Consultancy at Cotswold Archaeology (a Registered Archaeological Organisation [a CIfA RO], as regulated by the Chartered Institute of Archaeologists).

Mr Sutton has authored or provided the technical review of over 200 Cultural Heritage chapters of Environmental Statements and many hundred heritage assessments for planning applications. He has prepared over 50 expert witness statements for Public Inquiries, Hearings, Written Representations and planning committee meetings. He has appeared as an Expert Witness at NSIP examinations and planning and listed building appeal hearings and inquiries. He provides heritage advice to LPAs, developers, government agencies and interested third parties. He is on the Advisory Panel that drafted the new Principles for Cultural Heritage Impact Assessment on behalf of IEMA, IHBC and CIfA and he was the author of cultural heritage topic chapter for the third edition of the EIA Handbook (ed. Carrol, Fothergill, Murphy and Turpin; 2020).

The assessment work reported within the Original ES chapter was undertaken by competent practitioners at Worcestershire Archaeology (a CIfA RO), with geophysical survey work completed by SUMO.

Climate Change – Sarah Doyle and Gordon Allison (DustScanAQ)

Sarah Doyle BSc (Hons), MSc, AMIAQM, AMIEnvSc is a graduate consultant at DustScanAQ. She is an associate member of the Institute of Air Quality Management and the Institute of Environmental Sciences.

Gordon Allison BSc (Hons), BSc, MSc, MIAQM, MIEnvSc, is a Principal Consultant at DustScanAQ, whose focus is air quality and environmental management. He is a full member of the Institute of Air Quality Management and the Institute of Environmental Sciences, and DustScanAQ is a corporate member of the Institute of Environmental Management and Assessment.

2 Description of Proposals

2.1 Introduction

2.1.1 This section summarises the Updated Phased Working and Progressive Restoration associated with the change to the proposed mineral processing plant to one of a smaller size, and with a reduced operational acoustic volume, compared to that proposed and assessed within the original application scheme. This has allowed for the reduction in the number, height and / or duration of temporary soil storage / screening bunds and minimising the time when quarry operational land is required.

2.1.2 The following drawings have been produced to both clarify opportunities for phased restoration, minimising the time when quarry operational land is required and allowing for the reduction in the number, height and / or duration of temporary soil storage / screening bunds.

- Drawing No. E2370-SGA-001: Original Plant Proposal;
- Drawing No. E2370-SGA-002: Revised Plant Layout;
- Drawing No. 01-LEACF-INQ_001: Updated Temporary Soil Attenuation Mitigation Bunds;
- Drawing No. 01-LEACF-INQ_004: Initial Works;
- Drawing No. 01-LEACF-INQ_005: Phase 1 – Working & Restoration;
- Drawing No. 01-LEACF-INQ_006: Phase 2 – Working & Restoration;
- Drawing No. 01-LEACF-INQ_007: Phase 3 – Working & Restoration;
- Drawing No. 01-LEACF-INQ_008 - Phase 4 – Working & Restoration;
- Drawing No. 01-LEACF-INQ_009 - Phase 5 – Working & Restoration;
- Drawing No. 01-LEACF-INQ_010 - Final Works; and
- Drawing No. 01-LEACF-INQ_012 - Plant Site.

2.1.3 The ability to make changes emanating from confirmation by NRS (the Applicant and Operator) to change the proposed mineral processing plant to one of a smaller size, and with a reduced operational acoustic volume, compared to that proposed and assessed within the original application scheme.

2.1.4 The use of the quieter operating plant of ~6.334m in height will be located a minimum of 7m below existing ground levels.

2.1.5 On a direct comparison between the originally submitted scheme and the revised scheme, the changes are:

- Reduction in Processing Plant height (from 12m to 6.334m);
- Reduction in Processing Plant footprint (reduced from 2,752m³ to 451m³); and
- Reduction in noise levels from the Processing Plant.

2.1.6 Quarry plant and infrastructure has evolved over the course of the 5-6 years since the proposed development was first conceived. Whilst this change does not affect the appeal proposal per se, it does enable a change to the mitigation, and particularly to the height and duration of the bunds.

2.1.7 The processing plant as originally proposed is be located a minimum of 7m below adjacent ground levels and contained, therefore, this new plant would not require the same level of bund placement. Noise calculations indicate that these changes would allow the bunding to be reduced in height to 3 metres apart from in the vicinity of the McDonald's Bungalow, where the bund (Bund 7) will need to be 4 metres between the property and the works in Phase 1 (extraction and infilling).

2.1.8 There will be no change to the overall site Concept Restoration Scheme in respect of levels or landform. The only change in land use associated with the progressive restoration being the placement of a stretch of hedgerow / hedgerow trees adjacent to the eastern margin of Phase 4, which would now take place during the Initial Works Phase (Year 1) as opposed to as part of Final Works (Year 10). There would also be no changes in the length of mineral extraction, its cessation and the final restoration of the site.

2.2 Outline of Changes

2.2.1 Table 1 below details the changes made to the previous inquiry scheme. Drawing No. 01-LEACF-INQ_001 illustrates the updated requirement for Temporary Soil Attenuation / Mitigation Bunds.

Table 1: Changes

Phase	Changes	Change Accommodated by:
Initial Works	Bund 3 is to be reduced in height from 6m to 3m in height.	The overburden material which will be no longer stored in Bund 3 will be placed on the internal 1in3 batter slopes within the plant site onto which topsoil will be placed. Land to be seeded and maintained.
	Bund 5, which was to be located within the northern area of the plant site for the full duration of the scheme (10 years) is now not required until Phase 4 / 5 and is only required for approximately 5 years.	This bund was proposed for overburden storage. This material will now be placed for long term temporary restoration around the internal batter slopes of the plant site. Topsoiled, seeded and maintained.

	Bund 6 is no longer required. This 'bund' related to the spreading of topsoil on to the Phase 4 area to then to be used to restore Phase 5 / Final Restoration is not required.	This placement area was required for topsoil. These soils are to be placed on the internal Plant Site batter slopes, seeded and maintained as long term temporary restoration.
Phase 1	Bund 7 which is to be located along the eastern boundary of Phase 1 is to be reduced in height from 6m to 3m.	The reduction in the volume of soils materials required to create this temporary bund will be achieved by the progressive stripping and restoration of Phase 1, leaving additional soils in place until direct placement of materials is proposed. Changes in the distribution of overburden and subsoils between Bund 7 and 8 has enabled this.
	Bund 11 is no longer required.	The reason for this is the revised scheme's proposal for progressive soil stripping to allow direct placement of this material for restoration.
Phase 2	No Changes to Bund Profiles	
Phase 3	Bund 13 to be reduced in height from 4m to 3m.	The reduction in the volume of soils materials required to create this temporary bund will be achieved by the progressive stripping and restoration of Phase 3, leaving additional soils in place until direct placement of materials is proposed.
	Bund 14 to be reduced in height from 4m to 3m.	
	Bund 16 to be reduced in height from 4m to 3m.	
Phase 4	Bund 17 - No Change to Bund Profile.	
	Bund 18 will no longer be required.	Now that this bund is no longer required, the former subsoil storage volumes can be stripped and directly placed for progressive restoration within Phase 4.
	Bund 19 is to be reduced in height from 4m to 3m.	Minor variations proposed to bund footprint representing the interchange between Bund 19 and the former Bund 18 (now removed) to allow for storage of soils at 3m in height.
	Bund 20 - No Change to Bund Profile.	Note. This bund is proposed to be formed on to the base of extraction of Phase 4.
NO FURTHER BUNDS ARE REQUIRED FROM THIS STAGE – DIRECT PLACEMENT AND / OR THE RELEASE OF SOILS PREVIOUSLY HELD IN BUND TO BE UTILISED TO ACHIEVE FINAL RESTORATION		
Phase 5	No Change	

2.2.2 The above changes are illustrated on Updated Phased Working and Restoration Scheme Drawing Nos. Drawing No. 01-LEACF-INQ_004 to 01-LEACF-INQ_010. The associated soil bund storage and attenuation requirements being presented in Table 2.

Table 2: Soil Bund Storage & Attenuation Requirements

Bund	Description	Establishment Year	Soils Removed From Bund	Number of Years Soils in Bund
Bund 1	(3m high) – 3,300m³ - formed using Topsoil from the Initial Works area. Bund 1 is located to the south of the proposed plant site and north of South Lodge. The bund would remain in place throughout the duration of the development (c.10 to 11 years) when the soils will be used to restore Phase 5 / Final Restoration.	Year 1	Year 10-11	10-11 Years
Bund 2	(3m high) – 1,900m³ - formed using Subsoil from the Initial Works area. Bund 2 is located to the south east of the plant site and north of Broom Cottage. This bund would remain in place throughout the duration of the development (c.10 years) when the soils would be used to restore Phase 5 / Final Restoration.	Year 1	Year 10-11	10-11 Years
Bund 3 (reduced from 6m in height to 3m in height)	(3m high) – 14,481m³ - formed using 12,222m³ of Subsoil, and 2,259m³ of Overburden from the Initial Works area. Bund 3 is located immediately to the west of the plant site. The bund would remain in place throughout the duration of the development (c.10 to 11 years) when the soils will be used to restore Phase 5 / Final Restoration.	Year 1	Year 10-11	10-11 Years
Bund 4	(3m high) – 2,300m³ - formed using Topsoil from the Initial Works area. Bund 4 is located to the north east of the plant site. The bund would remain in place throughout the duration of the development (c.10 to 11 years) when the soils will be used to restore Phase 5 / Final Restoration.	Year 1	Year 10-11	10-11 Years
Bund 5 (Phase 4 & 5 only – previously in place from Year 1 for the full duration of the proposed development)	(6m high – within sunken plant site (~7m below ground level)) – 8,200m³ - formed of Overburden from the Plant Site Batter Strip. The overburden will be used for Final Restoration	Year 4.5	Year 10	6.5 Years

Bund 6 **Removed**	(0.3m high) – 5,100m³ - to be spread on Phase 4 to then restore Phase 5 / Final Restoration.	Not Required		
Bund 7 **(reduced from 6m in height to 3m in height)**	(3m high) – 12,270m³ - formed of subsoil from Phase 1 soil strip. Bund 7 is located to the west of the Bungalow. The bund will only be on place during Phase 1 mineral extraction and restoration period (c.1.5 years) when 10,000m³ of soils will be used to restore the Phase 1 Area and 2,270m³ subsequently used to restore Phase 2.	Year 1.5	Year 2.25	0.7 to 1 Year
Bund 8	(5m high) – 23,900m³ - formed of 17,698m³ of Subsoil and 6,202m³ of Overburden from Phase 1 soil strip. Bund 8 is located along the central western boundary of the site. The bund will be in place in full for the duration of Phase 1 and part in place for phase 2 and 3 as the extraction area progresses southwards (c.1.5 to 3.5 years) when the soils would be used to restore land in Phases 1 and 3.	Year 1.5	Year 3-4	1.5 to 3.5 Years
Bund 9	(3m high) – 2,915m³ - formed of Topsoil from Phase 1 soil strip. Bund 9 is located to the south and east of the Western Area's as dug mineral stockpile/ field hopper. The bund will be in place during the mineral extraction period of Phases 1, 2 and 3 (3 years) when soils would be used to restore the Phase 3 Area.	Year 1.5	Year 4.5	3 Years
Bund 10	(3m high) – 600m³ - formed of Topsoil from Phase 1 soil strip. Bund 10 is located to the east of the Western Area's as dug mineral stockpile/ filed hopper. The bund will be in place during the mineral extraction period of Phases 1, 2 and 3 (3 years) when soils would be used to restore the Phase 3 Area	Year 1.5	Year 4.5	3 Years
Bund 11 **Removed**	(3m high) – 12,100m³ - formed of Topsoil from the progressive Phase 1 soil strip. Bund 11 is located within the north of the Phase 1 void, post extraction. The bund will be in place during the mid and latter stags of Phase 1 extraction (~0.75 years) when the Topsoil will be used to restore Phase 1.	Not Required		
Bund 12	(3m high) – 7,200m³ - formed of Topsoil from Phase 2 soils strip. Bund 12 is located along the northern boundary of Phase 2. The bund will be in place during the mineral extraction and restoration period of Phase 2 (c.1 to 2 years) when soils would be used to restore the Phase 2 Area.	Year 2.25	Year 3.25 to 4.25	1 to 2 Years

Bund 13 (reduced from 4m in height to 3m in height)	(3m high) – 5,020m³ - formed of subsoil from Phase 3 soils strip. Bund 13 is located north of the as dug mineral stockpile/field hopper. The bund will be in place during the mineral extraction and restoration period of Phase 3 (c.1.5 years) when soils would be used to restore the Phase 3 Area.	Year 3.25	Year 4.5	1.25 Years
Bund 14 (reduced from 4m in height to 3m in height)	(3m high) – 2,356m³ - formed of Subsoil from Phase 3 soils strip. Bund 14 is located north of the unoccupied South Lodge (west) property. The bund will be in place during the mineral extraction and restoration period of Phase 3 (c.1.5 years) when soils would be used to restore the Phase 3 Area.	Year 3.25	Year 4.5	1.25 Years
Bund 15	(3m high) – 3,410m³ - formed of Topsoil from Phase 3 soils strip. Bund 15 is located along the southern boundary of Phase 3. The bund will be place during the mineral extraction and restoration period of Phase 3 (c.1.5 - 2 years) when soils would be used to restore the Phase 3 Area.	Year 3.25	Year 4.75 to 5.25	1.5 to 2 Years
Bund 16 (reduced from 4m in height to 3m in height)	(3m high) – 3,958m³ - formed of Subsoil from Phase 3. Bund 16 is located along the western boundary of Phase 3. The bund would remain in place during the mineral extraction and restoration period of Phase 3 (~ 1.5 – 2 years) when soils will be used to restore 3.	Year 3.25	Year 4.75 to 5.25	1.5 to 2 Years
Bund 17	(3m high) – 17,200m³ - formed of Topsoil from Phase 4. Bund 17 is located along the north and eastern boundaries of Phase 4. The bund would remain in place until the end of Phase 5 +/ Final Restoration (~ 6.5 years).	Year 4.5	Year 10	5.5 Years
Bund 18 Removed	(4 - 5m high) – 19,200m³ - formed of Subsoil from Phase 4. Bund 18 is located along the eastern boundary of Phase 4. The bund would remain in place throughout the extraction period for Phases 4 and 5 (c.6 years) where upon the soils will be used to restore Phase 5.	Not Required		
Bund 19 (reduced from 4m in height to 3m in height)	(3m high) – 3,000m³ - formed of Topsoil from Plant Site Batter strip. Bund 19 is located along the south eastern boundary of Phase 4. The bund will be in place for approximately 6 years.	Year 4.5	Year 10	5.5 Years
Bund 20	(6m high) – 7,000m³ - formed of progressively stripped Overburden from Phase 4 soil strip. This bund is proposed to	Year 4.5 to 6.25	Year 10	3.75 to 5.5 Years

	be formed on to the base of extraction of Phase 4. The bund will be in place for 3 to 6 years and will be used to restore Phase 5 / Final Restoration.			

2.3 Restoration

2.3.1 As set out above, there will be no change to the overall site Concept Restoration Scheme in respect of levels or landform. The only change in land use associated with the progressive restoration being the placement of a stretch of hedgerow / hedgerow trees adjacent to the eastern margin of Phase 4, which would now take place during the Initial Works Phase (Year 1) as opposed to as part of Final Works (Year 10). There would also be no changes in the length of mineral extraction, its cessation and the final restoration of the site.

2.3.2 The concept Restoration Scheme is illustrated on Drawing No. KD.LCF.010A – Concept Restoration (July 2021) (CD5.11).

3 Alternatives

3.1 Introduction

3.1.1 This chapter presents a review of the Alternative chapter in the Original ES (Chapter 6). Within the original chapter 6, the assessment of alternatives included consideration in terms of Do Nothing, Alternative Sand and Gravel Sources within Worcestershire, Alternatives to Primary Aggregates, Alternative Methods of Working, Alternative Restoration Options, Alternative Restoration Options and Alternative Means of Transport. It is considered that the considerations all remain valid. However, in terms of the proposed changes to the plant and the reduction in the number, height and / or duration of temporary soil storage / screening bunds and minimising the time when quarry operational land is required, the following sections set out alternative options considered in the development of this proposal.

3.2 Alternatives to the Proposed Scheme

3.2.1 Two main alternatives to the proposed scheme as illustrated on Drawing Nos. 01-LEACF-INQ_001 - 012 were considered along with an assessment of their viability.

3.2.2 Firstly, based upon the revised scheme, the consideration of replacing soil mitigation bunds with temporary agricultural straw bales with appropriate acoustic mitigating capabilities. These could be placed within the same / a similar location / footprint to the now proposed and reduced number and heights of soil bunds.

3.2.3 It became apparent very quickly if this approach were to be taken, there would be a surplus of soils which would have been released through stripping to allow mineral extraction, with no extracted land available during the Initial Works period and then subsequently to allow for the volume of soils to be directly placed for restoration. In effect new additional bunds would be required to temporarily store soils which could no longer be stored within the acoustic / visual mitigation bunds. This situation would compound as the scheme advanced through the detailed phased extraction period. It was concluded that this option would not allow for an efficient and progressive restoration strategy. It would also be inefficient in terms of increasing soil storage and associated vehicle movement and costs of double handling of materials.

3.2.4 Secondly, a revised approach to mineral phased extraction was investigated. This involved flipping the proposed phasing to work (extract) all land in the east first, (currently Initial Works and Phases 4 and 5,) before crossing westwards to work the current Phases 1, 2 and 3. This could be achieved as there is no requirement for soils material from the western and eastern extraction areas to cross the internal access track and be utilised for either bund mitigation or restoration on the other side of the track. Both areas of the Site being designed to be self-contained achievable and monitorable in terms of material movements.

3.2.5 We also looked at any opportunities to move soils materials for storage, screening and / or restoration between the two areas. It is considered that neither of these approaches would further reduce the number or height of the temporary soil storage / mitigation bunds.

3.2.6 The main reasons for this being the requirement of bunds to achieve mitigation measures remain the same, the volumes of soils materials remain the same and the plant site located a minimum of 7m below adjacent ground levels would not move during the proposed development. To relocate the plant site would potentially result in the requirement for additional mitigation bunds and / or a delay in the progressive restoration of land post sequential phased mineral extraction.

3.2.7 We therefore consider that the revised scheme is the most effective and efficient development option, which will allow for the very swift progressive restoration of land whilst mitigating / reducing potential environmental and amenity effects over the temporary and relatively short life of the proposed development.

3.3 Conclusions

3.3.1 In conclusion, the applicant has studied a number of alternative proposals regarding the proposed development.

3.3.2 The 'do nothing option' is not the preferred option for the Company as it would prevent the creation of 11 potential direct jobs as well as the impact on associated indirect jobs and input to the local economy and the sterilization of a viable and high quality mineral supply to meet identified need, as required by both adopted and emerging Minerals Local Plan Policy.

3.3.3 Consideration to alternative working methods and arrangements and alternative transport options have been given consideration as part of the environmental assessment work. The scheme of working as proposed is considered to have the least environmental impact and is therefore the preferred option. Consideration to alternative restoration schemes have been given and with the proposed scheme providing the opportunity of diversifying the site land uses for amenity and wildlife enhancement.

3.3.4 The proposals as submitted represent the best scheme from both sustainability and commercial viability points of view as well as being the most environmentally acceptable.

4 Landscape and Visual Impact

4.1 Introduction and Policy Context

4.1.1 This chapter presents a review of the Landscape and Visual Effects chapter in the Original ES (Chapter 7), structured against the same section headings for ease of comparison.

4.1.2 The NPPF and the Development Plan contain policies and text concerning the protection and enhancement of landscape. In particular:

- NPPF sections 13, 15 and 170;
- Worcestershire Minerals Local Plan (2018-2036) Policies MLP 27 and MLP 33;
- Wyre Forest Local Plan 2016-2036 Policies SP.22 and SP.34.

4.1.3 The thrust of these policies is consistent with advice in NPPF to protect, maintain and enhance the landscape. In terms of development in the countryside, consideration must be given to the potential for material impact upon the landscape and visual amenity and whether these effects are considered significant or not.

4.2 Methodology

4.2.1 This Addendum chapter adopts the LVIA methodology of the original ES (Appendix B of Technical Appendix A prepared by Kedd Limited). The methodology reflects best practice guidance including the Guidelines for Landscape and Visual Impact Assessment 3rd Edition (GLVIA 3).

4.2.2 GLVIA 3 recognises the importance of the following factors in carrying out an LVIA:

- Professional judgement[1], also recognised at paragraph 46 of the LVIA methodology;
- Avoiding an over-reliance on matrices, with the emphasis on narrative text[2] also recognised at paragraph 46 of the LVIA methodology; and
- The importance of considering both the duration and reversibility of effects resulting from the proposals (including temporary bunds) when considering the magnitude of change and significance[3]. Duration and reversibility is recognised in tables A6 and A7 of the LVIA methodology and details of when in the phasing programme different effects would be experienced are described in the main ES chapter.

[1] Paragraphs 2.23 -2.25 of Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA 3) published by the Landscape Institute and IEMA (2013)
[2] Paragraphs 3.35-3.36 of Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA 3) published by the Landscape Institute and IEMA (2013)
[3] Paragraphs 3.26, 5.51-5.52 and 6.41 of Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA 3) published by the Landscape Institute and IEMA (2013)

4.2.3 In order for readers of the ES Addendum to more clearly understand the duration of adverse landscape and visual effects, which are all temporary and fully reversible, the following time periods have been adopted, reflecting recommendations set out in GLVIA 3.[4]

- Short term: 0-5 years
- Medium term: 5-11 years
- Long term: 11-25 years

4.2.4 The definitions of time periods have been applied to distinct phases of the development as follows:

- Short term: Temporary adverse effects associated with Phases 1-3 extraction and progressive restoration, and following the restoration of Phases 1-3, the extraction and progressive restoration of Phases 4-7 inclusive of temporary screen bunds;
- Medium term: Temporary adverse effects associated with the plant site including temporary bunding; and
- Long term: Permanent beneficial effects resulting from growth of mitigation planting and restoration of a parkland landscape, reflecting the historic layout.

4.3 Updated Illustrative Material

4.3.1 Updated photomontages have been prepared by HCUK Group to illustrate the differences between the original and revised scheme, including additional photomontages from three previously selected viewpoints where the temporary bunds would be clearly visible (i.e. Viewpoints 15, C and D). The full set of visualisations and viewpoint location plan are included as Figures 4.1 to 4.70 at Appendix A of this Addendum.

Figure 4.1	Photoviewpoint Locations
Figure 4.2	Viewpoint 1: Annotated Photoview from public footpath 628(B)
Figure 4.3	Viewpoint 2: Annotated Photoview from A449
Figure 4.4	Viewpoint 3: Annotated Photoview from A449/Park Gate Road
Figure 4.5	Viewpoint 4: Existing View and Year 1 from Park Gate Road (Original and Revised Scheme)
Figure 4.6	Viewpoint 4: Photomontage Year 10 from Park Gate Road (Original and Revised Scheme)
Figure 4.7	Viewpoint 4: Photomontage Year 25 from Park Gate Road (Original and Revised Scheme)
Figure 4.8	Viewpoint 5: Annotated Photoview from A451
Figure 4.9	Viewpoint 6: Annotated Photoview from Heath Drive
Figure 4.10	Viewpoint 8: Annotated Photoview from public bridleway 625(B)
Figure 4.11	Viewpoint 9: Existing View from Castle Barns
Figure 4.12	Viewpoint 9: Photomontage Year 1 from Castle Barns (Original Scheme)

[4] Paragraphs 5.51-5.52 of Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA 3) published by the Landscape Institute and IEMA (2013)

[Viewpoints 11 and 12 from original ES not included as no views of the proposed development due to intervening landform]

[Viewpoint 16 from original ES not included as very similar and close to Viewpoint 15]

[Viewpoint 19 from original ES not included as no views of the proposed development due to intervening landform]

[Viewpoint 22 from original ES is a duplication of Viewpoint 21]

Figure 4.39 Viewpoint 23 - Annotated Photoview from Wolverley Road
Figure 4.40 Viewpoint 24 - Annotated Photoview from Wolverley Road (School)

[Viewpoint 25 from original ES not included as within the school grounds and represented by Viewpoint 24]

Figure 4.41 Viewpoint 26 - Annotated Photoview from public bridleway 626(B)
Figure 4.42 Viewpoint 27 - Annotated Photoview from Wolverley Road - Abbots Croft
Figure 4.43 Viewpoint 28 - Annotated Photoview from Sion Hill
Figure 4.44 Viewpoint 29 - Annotated Photoview from Wolverley Road near access
Figure 4.45 Viewpoint 30 - Annotated Photoview from Broom Cottage
Figure 4.46 Viewpoint 31- Annotated Photoview from Wolverley Road at Four Winds

The following views A to D were supplementary views included in addition to the original ES views in the HCUK Landscape Proof of Evidence, taken from the same visual receptor routes assessed in the original ES.

Figure 4.47 Viewpoint A - Annotated Photoview from public bridleway 625(B)
Figure 4.48 Viewpoint Ba - Annotated Photoview from bridleway 625(B) (part 1)
Figure 4.49 Viewpoint Bb - Annotated Photoview from bridleway 625(B) (part 2)
Figure 4.50 Viewpoint Ca: Existing View
Figure 4.51 Viewpoint Ca: Photomontage Year 1 from bridleway 626(B) (part 1) (Original Scheme)
Figure 4.52 Viewpoint Ca: Photomontage Year 1 from bridleway 626(B) (part 1) (Revised Scheme)
Figure 4.53 Viewpoint Ca: Photomontage Year 10 from bridleway 626(B) (part 1) (Original Scheme)
Figure 4.54 Viewpoint Ca: Photomontage Year 10 from bridleway 626(B) (part 1) (Revised Scheme)
Figure 4.55 Viewpoint Ca: Photomontage Year 25 from bridleway 626(B) (part 1) (Original and Revised Scheme)
Figure 4.56 Viewpoint Cb: Existing View from bridleway 626(B) (part 2)
Figure 4.57 Viewpoint Cb: Photomontage Year 1 from bridleway 626(B) (part 2) (Original Scheme)
Figure 4.58 Viewpoint Cb: Photomontage Year 1 from bridleway 626(B) (part 2) (Revised Scheme)
Figure 4.59 Viewpoint Cb: Photomontage Year 10 from bridleway 626(B) (part 2) (Original Scheme)
Figure 4.60 Viewpoint Cb: Photomontage Year 10 from bridleway 626(B) (part 2) (Revised Scheme)
Figure 4.61 Viewpoint Cb: Photomontage Year 25 from bridleway 626(B) (part 2) (Original and Revised Scheme)
Figure 4.62 Viewpoint Da: Existing View from footpath 624(B) (part 1)
Figure 4.63 Viewpoint Da: Photomontage Year 1 from footpath 624(B) (part 1) (Original and Revised Scheme)
Figure 4.64 Viewpoint Da: Photomontage Year 4 from footpath 624(B) (part 1) (Original Scheme)
Figure 4.65 Viewpoint Da: Photomontage Year 25 from footpath 624(B) (part 1) (Original and Revised Scheme)

Figure 4.66 Viewpoint Db: Existing View from footpath 624(B) (part 2)
Figure 4.67 Viewpoint Db: Photomontage Year 1 from footpath 624(B) (part 2) (Original and Revised Scheme)
Figure 4.68 Viewpoint Db: Photomontage Year 4 from footpath 624(B) (part 2) (Original Scheme)
Figure 4.69 Viewpoint Db: Photomontage Year 25 from footpath 624(B) (part 2) (Original and Revised Scheme)
Figure 4.70 Viewpoint E: Annotated Photoview from Hayes Road, Fairfield

4.3.2 All plan figures submitted with the original LVIA Chapter remain unchanged.

4.4 Potential for Mitigation

4.4.1 Mitigation and landscape and visual enhancement measures will be implemented both in advance of mineral extraction and during progressive phased working and restoration. Progressive working and restoration of the site is a mitigating factor in itself as it restricts the amount of disturbed land at any one time.

4.4.2 Other mitigation and enhancement measures to be integrated within the scheme include:

- limiting extraction areas to include only areas with more enclosed and contained visual landscape in the Eastern Area, to exclude the easternmost section of the application site;
- use of distance standoffs from residential property including the Bungalow and Castle Barns;
- advanced avenue tree, shrub and hedgerow planting;
- seeded and maintained temporary soil screening bunds;
- lowering the plant site c. 7m below adjacent ground levels;
- the creation of a high quality agriculturally managed parkland with pocket parks; and
- additional c. 2.3km of new footpath, bridleway and cycleways, offering potential for enhanced wellbeing recreation and leisure.

4.4.3 Furthermore, all land within the application site boundary will also be placed in long-term Aftercare and Management Plan to guarantee the restoration and use of all restoration elements and amenity benefits.

4.4.4 It is the intention of the Applicant post-restoration to ensure a strengthening of appropriate landscape elements and features which respect and replicate the site's historic past whilst providing new and increased diversity and net gain of individual landscape elements along with the promotion and integration of amenity and wellbeing opportunities. This includes pocket parks based around a green infrastructure strategy. New habitats will also be created

including 8.1ha of acidic grassland, woodland and blocks and parkland trees which will promote biodiversity. This would result in an overall Significant beneficial effect.

4.5 Assessment of Amended Scheme

4.5.1 The reduction in the height of selected bunds and reduction in plant area footprint would not alter the overall strategy for retention of existing vegetation and mitigation planting that was designed for the original scheme. Consequently, there would be no change to the assessment of landscape elements.

4.5.2 The proposed reduction in processing plant height from 12m to 6.3m, a reduction in plant area footprint from 2,752m^3 to 751m^3, reduction in noise levels from the processing plant and the reduction in height of some of the temporary bunds would all represent operational phase improvements compared with the original scheme.

4.5.3 It is assessed that the changes to Landscape Character at a site level as a result of the revised scheme would not result in a reduction in the overall magnitude of change from Medium resulting in a Moderate adverse effect, identified for the original scheme. This conclusion is reached because the assessment of landscape character effects covers the full geographical extent of extraction and restoration activity that across the site as a whole remains unchanged.

4.5.4 The post restoration landscape scheme is unchanged and therefore the post restoration effect upon landscape character would remain Significant and beneficial relative to the current baseline.

4.5.5 The photomontages **(Figures 4.1 to 4.70)** illustrate modest, but clearly beneficial changes to visual amenity in the medium term resulting from the reduction in height of some temporary bunds during the operational phase, notwithstanding the assessment that the original scheme would result in effects upon visual receptors that, at most, would be Moderate and Not Significant. The key changes relative to the existing scheme comprise:

a. Public views from bridleway 626 (B) that passes the plant site (Annotated photoview from Viewpoint B at **Figures 4.48 to 4.49** and the photomontages from Viewpoint C at **Figures 4.50-4.61**) where the reduction in height from 6m to 3m of the temporary bund 3 surrounding the plant site would be noticeable during the full length of the operational phase i.e. a medium term noticeable improvement relative to the original scheme. The overall magnitude and visual effects during the operational phase would remain unchanged from the original scheme i.e. Moderate adverse and Not Significant.

a. Private views from the rear of the Bungalow (see Photomontages from Viewpoint 17c at **Figures 4.29-4.34**) where the reduction in height from 6m to 3m of the temporary bund 3 surrounding the plant site would be perceptible during the full length of the

operational phase i.e. a medium term noticeable improvement relative to the original scheme. The overall magnitude and visual effects during the operational phase would remain unchanged from the original scheme i.e. up to Moderate adverse and Not Significant.

b. Public views would be experienced from Footpath 624 (B) to the east of the plant site. The revised scheme would be visible as a reduction in height from 6m to 3m of the temporary bund 3 surrounding the plant site following the restoration of Phases 1 and 2 (see Viewpoint D at **Figures 4.62-4.71**). The changes would represent a medium term slight improvement relative to the original scheme. The overall magnitude and visual effects during the operational phase would remain unchanged from the original scheme i.e. Moderate adverse and Not Significant.

c. Public views of the proposals would be experienced by road users and public rights of way users to the west of the proposals and the residents of Castle Barns. The revised scheme would result of the omission of bund 18 and the reduction in height of bund 19 from 4m to 3m in height (see Annotated Photoviews from Viewpoints 1, 2, and 3 at **Figures 4.2 to 4.4**, Annotated Photoviews from Viewpoints 5, 6, at **Figures 4.8 and 4.9** and Photomontages from Viewpoint 9 at **Figures 4.12-4.16**). The changes to the screen bunds and advance planting of the new hedgerow would represent a medium term slight improvement compared with the original scheme. The overall magnitude and visual effects during the operational phase would remain unchanged from the original scheme i.e. Minimal to Moderate adverse and Not Significant.

4.6 Landscape and Visual Impact Conclusions

4.6.1 The original ES concluded that whilst the proposals would result in some short or medium term disturbance to landscape character and views experienced in the vicinity of the site, these localised adverse effects would be not significant. This conclusion reflects the important role of screening bunds in limiting visibility of the extraction and progressive restoration activity that is typical during the life of sand and gravel extraction.

4.6.2 In the long-term, once the parkland landscape has matured, the proposed development would have a significant beneficial landscape character effect, relative to the existing baseline. There would also be improvements (not significant) to the visual amenity of public rights of way users passing through the Site.

4.6.3 The revised proposals would result in some short and medium term improvements to the landscape character and views of some receptors, relative to the existing scheme. These changes would be most clearly perceived from bridleway 626 (B) that passes the plant site (Viewpoints B and C) and the rear of the Bungalow (Viewpoint 17c), with more modest improvements as a result of the reduction in height of the screen bunds around the plant site

experienced from Footpath 624 (B) (Viewpoint D). Improvements in visual impact compared with the original scheme would also be observed in views from the west as a result of the reduction in number and height of the temporary screen bunds (Viewpoints 1, 2, 3, 5, 6, and 9).

4.6.4 The landscape and visual improvements from a reduction in height of selected temporary screen mounds, whilst an improvement in landscape and visual terms are assessed not to result in a reduction in a change to the overall magnitude of change and associated effects assessed for the original scheme. This conclusion is reached because the LVIA methodology, based on best practice guidance, contains broad assessment categories and judgements have to take into account the overall areas of disturbance and associated timescales, which do not materially change. Landscape and visual effects during the operational phase would continue to be not significant for the short to medium term with significant long term beneficial landscape effects.

4.6.5 It was assessed that there would be no significant adverse cumulative landscape or visual effects from the original scheme. The other development schemes previously assessed as part of the cumulative baseline remain unchanged and consequently the cumulative assessment conclusions remain unchanged, noting the reduction in the size and number of screen bunds would not result in any change to the nature of potential cumulative effects with other developments.

5 Noise

5.1 Introduction and Policy Context

5.1.1 This chapter presents an update and review of the Noise Effects chapter in the Original ES (Chapter 10), structured against the same section headings for ease of comparison. The Noise Effects Chapter of the original ES was supported by a Noise Impact Assessment (Technical Appendix D).

5.1.2 The review has primarily considered the implications of the proposed revised scheme with regards to noise aspects. The review has also considered any updates to relevant policy, legislation and guidance in relation to noise. Any identified changes have been assessed to determine the potential implications on the original assessment findings and presented mitigation recommendations and these are discussed in this Chapter. Where necessary revised assessment and mitigations options are provided.

5.1.3 The NPPF and the Development Plan contain policies and text concerning the protection of amenity and management of noise associated with development proposals. In particular:

- NPPF section 17 and Planning Practice Guidance for Minerals (PPGM) paragraphs 19-22;
- Worcestershire Minerals Local Plan (2018-2036) Policy MLP 28; and
- Wyre Forest Local Plan 2016-2036 Policies SP.16, SP.33 and SP.34.

5.1.4 The thrust of these policies is to ensure that development does not cause an unacceptable adverse impact in terms of noise. The policies seek to ensure the protection of sensitive receptors and users.

5.1.5 The guidance from PPGM in particularly relevant, and can be used to set appropriate noise limits for normal and temporary site operations. There have been no changes to the guidance in PPGM since the previous noise assessment was prepared.

5.1.6 With regard to the noise limits for normal operations, Paragraph 021 from PPG states:

"What are the appropriate noise standards for mineral operators for normal operations?

Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level (LA90,1h) by more than 10dB(A) during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) LAeq, 1h (free field)…"

5.1.7 With regard to the noise limits for temporary operations, Paragraph 022 from PPG states:

"What type of operations may give rise to particularly noisy short-term activities and what noise limits may be appropriate?

Activities such as soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance.

Increased temporary daytime noise limits of up to 70dB(A) LAeq 1h (free field) for periods of up to eight weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs…"

5.1.8 Mineral planning guidance, contained in NPPF, advises on controlling the effects of mineral development and keeping potential impact to a minimum.

5.1.9 In addition, the Noise Policy Statement for England (NPSE) was published in March 2010 with the aim of providing "*clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion*." NPSE encourages effective management and control of noise to avoid and mitigate significant adverse impacts on health and quality of life and contribute to the improvement of health and quality of life where possible.

5.2 Baseline Conditions

Noise Sensitive Receptors

5.2.1 The nearest residential receptors to the site, as included in the previous assessment, are located to the south (along the B4189 Wolverley Road including Broom Cottage, South Lodge and Heathfield Knoll School), west (houses on Brown Westhead Park), north (McDonalds Bungalow and Keepers Cottage), and north-east (Castle Barns).

5.2.2 Since the Original ES an additional 4 dwellings (bungalows) have been constructed on Brown Westhead Park to the west of the Site under a planning permission granted in 2020 (ref: 20/0217/FULL). These properties are to the south of the houses on Brown Westhead Park included in the original assessment.

5.2.3 The noise from the proposed scheme will be assessed for the locations listed above, including the bungalows.

5.2.4 Other residential development has occurred and is under construction in the area, however these are at much further distances from the site than the receptors identified above. As such, these have not been included in this updated assessment.

Baseline Noise

5.2.5 Baseline noise measurements were undertaken in June and July 2018 at locations that were considered as being representative of the nearest existing properties to the proposed extraction / infilling area and processing plant. Baseline noise surveys were conducted in appropriate conditions over a number of days, as detailed in the original ES. The results of the 2018 baseline noise surveys were used to suggest noise limits for the proposed quarry.

5.2.6 The baseline noise measurements in 2018 were undertaken on days with low winds / calm conditions. The results of the 2018 surveys found that road traffic was the dominant noise source affecting the receptor locations.

5.2.7 An updated baseline noise survey was undertaken in February 2023 at the existing properties. The survey details and results from February 2023 are presented in **Appendix B.1**. The noise survey locations used in 2018 and 2023 are shown in **Appendix B.2**.

5.2.8 The measurements in February 2023 were undertaken with a moderate westerly breeze, which although was within acceptable ranges of wind speeds for external noise measurements, meant that there was more noise from wind / rustling leaves and road traffic from the west. The prevailing wind direction in the UK is from the south-west. Overall, road traffic remained the significant noise source affecting all survey locations.

5.2.9 A summary of the 2018 and 2023 background noise level results at existing receptors, is tabulated below, The suggested noise limits are also provided, based on the 2018 baseline data, and using the guidance from Planning Practice Guidance for Minerals (i.e. L_{A90} value + 10 dB, with an upper limit of 55 dB).

Baseline Noise Data from 2018 and 2023 (Existing Receptors)					
Survey Location	**2018 Data**	**2018 Range (Average) dB L_{A90}**	**Suggested Noise Limit from 2018 Results dB $L_{Aeq,1h}$**	**2023 Sample Results (Average) dB L_{A90}**	**Comment**
1. Broom Cottage	Samples	40-43 (41)	53	48, 48 (48)	2023 noise data is within the range of the previous install results. A noise limit based on 2023 data would be 2 dB higher than current limit, and be at the upper limit recommended in PPGM.
	Install	35-54 (43)		-	
2. South Lodge	Samples	46-48 (47)	55	49, 54* (49)	Excluding data affected by farm activity, the 2023 sample is similar to previous results. A noise limit based on 2023 data would be the same as the current limit being at the upper limit recommended in PPGM.

Baseline Noise Data from 2018 and 2023 (Existing Receptors)					
Survey Location	**2018 Data**	**2018 Range (Average) dB L_{A90}**	**Suggested Noise Limit from 2018 Results dB $L_{Aeq,1h}$**	**2023 Sample Results (Average) dB L_{A90}**	**Comment**
3. Heathfield Knoll School	Samples	46-50 (48)	55	53, 55 (54)	The 2023 data is around 6 dB higher than 2018 results. However, the noise limit based on the 2023 data would be the same as current limit being at the upper limit recommended in PPGM.
4. Brown Westhead Park	Samples	34-38 (36)	46	46, 47 (46)	The 2023 data is around 10 dB higher than 2018 results. A noise limit based on 2023 data would be 9 dB higher than current limit at the upper limit recommended in PPGM.
5. McDonalds Bungalow	Samples	31-37 (35)	45	42, 44 (43)	The 2023 data is around 8 dB higher than the 2018 results. A noise limit based on 2023 data would be 8 dB higher than current limit.
6. Keepers Cottage	Samples	35-41 (39)	49	41 (see also 7')	The 2023 samples (including 7')** is similar to the upper limit of the previous results. A noise limit based on 2023 data would be 2 dB higher than current limit.
7. Castle Barns	Samples	33-43 (39)	51	40 (see also 7')	The 2023 data (including 7')** is within range of previous results. A noise limit based on 2023 data would be the same as current limit.
	Install	31-47 (41)		-	
7'. Near North Lodge	Samples	-	-	41, 42	See locations 6 & 7 above
* affected by local farm activity, excluded from average ** Location 7' is near to both locations 6 & 7, therefore the average results for these locations also include the results from Location 7'					

5.2.10 The results from the 2023 survey confirm that the 2018 baseline noise measurements appear to have been undertaken under 'worst case conditions' resulting in lower background noise levels than would be likely to occur normally under different / stronger wind conditions. The suggested noise limits derived from the 2018 baseline, are therefore a 'worst case', resulting in more stringent / conservative noise limits than might occur based on 2023 survey data.

5.3 Potential for Impact

Proposed Scheme Changes

5.3.1 Full details of the changes to the proposed soils placement scheme and processing plant are summarised Chapter 2 of this ES Addendum.

5.3.2 The most significant change with regard to noise is the reduction in noise output from the processing plant from 109 dB L_{WA} to 103 L_{WA} as a result of new equipment being proposed. The new equipment is also at a lower height than that originally proposed.

5.3.3 Quarry plant and infrastructure has evolved over the course of the 5-6 years since the proposed development was first conceived. Whilst this change does not affect the appeal proposal per se, it does enable a change to the proposed mitigation, and particularly to the height of the bunds and the duration over which they are required to be in place.

5.3.4 The processing plant as originally proposed is be located a minimum of 7m below adjacent ground levels. As a results of the lower noise output, new plant would not require the same level of bund placement. Where retained, bunding in the vicinity of the plant site has generally been reduced in height to 3 metres apart from Bunds 7 and 8.

5.3.5 Bund 7 is in the vicinity of the McDonald's Bungalow. This bund was originally proposed at a height of 6 metres. The height has been reduced to 4 metres between the property and the works to provide mitigation from site activity in Phase 1 (extraction and infilling). This bund will be removed once Phase 1 is completed.

5.3.6 Bund 8 is located along the central western boundary of the site at a height of 5 metres, to provide mitigation to the dwellings to the west of the site. The bund will be in place in full for the duration of Phase 1 and part will be in place for Phases 2 and 3.

5.3.7 The revised scheme does not result in any changes to the duration of the mineral extraction operations, its cessation or the final restoration of the site. Similarly, it does not result in any changes to the proposed extent of extraction or the methods of working.

5.3.8 The use of quieter mobile plant has been taken into account including the use of a quieter dozer (reduced from 108 dB L_{WA} to 106 dB L_{WA}) and loading shovel (reduced from 106 dB L_{WA} to 104 dB L_{WA}). These are reasonable adjustments and data can be provided showing models with measured sound power levels at or below these values.

5.3.9 In addition, during the proposed operations for Phase 1, it should be possible to ensure that mineral extraction does not take place at the same time as infilling and/or soils restoration works. All mineral extraction will be completed within Phase 1 before restoration commences in that phase. This should not delay the restoration of Phase 1, which will be fully restored before mineral extraction commences in Phase 2.

5.3.10 For the other phases, there is to be simultaneous activities with infilling occurring in the

preceding phase.

5.3.11 The revised scheme would not result in any changes to the expected HGV movements to / from the Site during the duration of the development.

5.3.12 The implications of these changes to the processing plant, mobile plant and the bunding on the original presented noise assessment are discussed below.

Previous Noise Assessment

5.3.13 The previous noise assessment carried out baseline noise surveys in 2018, suggested noise limits based on the survey results, and assessed the noise from the previous proposed development to these limits. The proposed development has the potential for noise generation through normal and temporary site activities.

5.3.14 Normal site activities include the extraction of sand and gravel, transportation of material, material processing and infilling activities. The noise limit for these operations is derived from the measured baseline background noise level as per the advice in PPGM. The presented noise levels for each receptor location are due to the closest operations, taking into account the as-then embedded mitigation (bunds) with all site noise levels complying with the suggested site noise limits for each location.

5.3.15 The noise levels for normal operations from the proposed operations (taking into account the modifications to the processing plant, mobile plant and surrounding bunds) will be re-assessed taking into account the revised proposals.

5.3.16 Temporary activities include topsoil and overburden stripping, bund formation and the final restoration processes. These operations are often noisier than extraction and infilling, as they tend to be closer and are usually unscreened. They are relatively short duration operations that are capable of completion in a total period of no more than eight weeks in any twelve month period. Temporary operations are subject to a higher noise limit that normal site operations. The previous assessment found that noise from temporary operations complied with the required noise limit.

5.3.17 As there should be no changes to the temporary operations in terms of distance and typical equipment used for temporary operations, the noise from such operations has not been re-assessed.

Updated Noise Assessment

Noise Calculation Methodology

5.3.18 As per the previous assessment, the calculations in this report are based on the methods contained in BS5228-1: 2009 + A1: 2014 “Code of practice for noise and vibration control on construction and open sites – Part 1: Noise”. The details of the calculation methods used are the same as the original assessment.

5.3.19 For the purposes of examining a reasonable worst case, various plant items have been assumed to operate at the closest practical position of the proposed operating areas to each receiver location. These plant items and the corresponding Sound Power Levels (L_{WA}) are tabulated below.

5.3.20 The calculations assume that all plant on site is operating simultaneously in the closest likely working areas to each receiver location for the proposed extraction or infilling for Phase 1, with combined activities in the other phases. The ground between the site and the assessment locations is assumed to be 90% soft.

Noise Sources and Sound Power Levels

5.3.21 The plant items proposed to work at the site are tabulated below. Sound Power Levels, dB L_{WA}, of each selected plant item are shown, based on similar plant items on the WBM plant noise database.

Plant Item	**Height***	**% On-time / use**	**dB L_{WA}**
Excavation			
Excavator for sand and gravel extraction (50% of the time)	2m	50%	104 dB
Excavator loading dump truck (50% of the time)	2m	50%	104 dB
Mineral transport			
Dump trucks to/from field hopper	2m	6 movements per hour	106 dB
Field hopper	1m	100%	93 dB
Field Conveyor	2m	100%	74 dB per meter
Infilling			
Lorries for imported inert material	2m	8 movements per hour	104 dB
Dozer to profiles imported inert material	2m	75%	106 dB
Plant Site			
Updated processing plant – crusher & sand plant**	3.5m	100%	100 dB
Updated processing plant – screen & conveyors**	4.5m	100%	100 dB
Loading shovel at processing plant	2m	100%	104 dB
Access road			
Lorries on site access road	2m	16 movements per hour	104 dB
* height above local ground			

** combined sound power level of 103 dB L_{WA} for the processing plant

Noise from Normal Operations

5.3.22 Site noise limits have been suggested, in line with the advice contained in PPGM, based on the baseline background levels measured in 2018. The limits are the average background noise level plus 10 dB(A), with an upper limit of 55 dB $L_{Aeq,1h}$ at the nearest noise sensitive premises for normal daytime operations on site.

5.3.23 Site noise calculations have been undertaken for the seven previous receiver locations plus the bungalows on Brown Westhead Park, which correspond to the residential locations that are closest to the proposed extraction / infilling area and the processing plant site for each phase. The worst case (i.e. highest) site activity noise level arising from normal operations for each receptor is presented in this assessment.

5.3.24 A comparison of the calculated worst-case daytime site noise levels at the receiver locations and the suggested site noise limits is shown in the following table. The calculated site noise levels and the suggested site noise limits in the table below are all in terms of dB $L_{Aeq,1h}$.

Site Noise Calculation Receiver Location	**Suggested Site Noise Limit dB $L_{Aeq,1h}$**	**Worst Case Site Noise Normal Operations dB $L_{Aeq,1h}$**	**Phase Causing Highest Site Noise**
1. Broom Cottage	53	52	Phase 3 extraction & infilling in Phase 2, Phase 4 extraction & infilling in Phase 3
2. South Lodge	55	51	Phase 3 extraction & infilling in Phase 2
3. Heathfield Knoll	55	45	Phase 3 extraction & infilling in Phase 2
4. Brown Westhead Park (houses)	46	45	Phase 1 infilling, Phase 3 extraction & infilling in Phase 2
5. McDonalds Bungalow	45	45	Phase 1 infilling, Phase 4 extraction & infilling in Phase 3, Phase 5 extraction & infilling in Phase 4
6. Keeper's Cottage	49	44	Phase 4 extraction & infilling in Phase 3, Phase 5 extraction & infilling in Phase 4
7. Castle Barns	51	46	Phase 4 extraction & infilling in Phase 3, Phase 5 extraction & infilling in Phase 4
8. Brown Westhead Park (bungalows)	46*	43	Phase 3 extraction & infilling in Phase 2
* Assumed same noise limit as the Brown Westhead Park houses			

5.3.25 The highest calculated daytime site noise levels for each location are presented above, including infill and/or extraction operations combined with the proposed processing plant site. The assessment of potential for impact has assumed that all plant on-site is operating simultaneously in the closest likely working areas to each receiver location for each phase.

5.3.26 The calculated worst case site noise levels due to normal operations at the proposed site comply with the suggested site noise limits at all the chosen assessment locations.

5.3.27 It is considered that with the appropriate mitigation measures implemented, the proposals will not result in an unacceptably adverse impact on the closes receptors to the application site, or the wider area.

5.4 Potential for Mitigation

5.4.1 The original scheme of mineral extraction was designed with extensive embedded noise mitigation measures, such as having the plant site at lower ground levels than the surrounding area and the formation of bunds to mitigate the potential for noise impact, where necessary.

5.4.2 Site noise limits were suggested based on the average background noise level plus 10 dB(A) with an upper limit of 55 dB $L_{Aeq,1h}$ at the nearest noise sensitive premises. The identified noise sensitive receptors are the residential locations closest to the proposed extraction/infilling area and processing plant. The suggested noise limits were derived from the 2018 baseline, and are considered to be a 'worst case', resulting in more stringent / conservative noise limits than might occur based on 2023 (or later) noise survey data.

5.4.3 These mitigation measures are retained as part of the revised scheme, albeit with reductions in height to several of the bunds. Full details of the changes to the proposed soils placement scheme and processing plant are summarised elsewhere in this ES Addendum.

5.4.4 The mitigation measures also include the use of new processing equipment, with a reduction in noise output from the processing plant from 109 dB L_{WA} to 103 L_{WA}. The new equipment is also at a lower height than that originally proposed.

5.4.5 The use of quieter mobile plant has also been considered for the dozer (reduced from 108 dB L_{WA} to 106 dB L_{WA}) and loading shovel (reduced from 106 dB L_{WA} to 104 dB L_{WA}). These are reasonable adjustments and data can be provided showing models with measured sound power levels at or below these values.

5.4.6 The mitigation measures also include non-simultaneous extraction and infill operations in Phase 1. All mineral extraction will be completed within Phase 1 before restoration commences in that phase and mineral extraction will only commence in Phase 2 once the works in Phase 1 are fully completed. For the other phases, there is to be simultaneous activities with infilling occurring in the preceding phase.

5.5 Noise Conclusions

5.5.1 The original ES concluded that the proposal has been found to be acceptable in terms of noise, for both normal and temporary operations at sensitive receptors located off site. The assessment found that with appropriate measures the relevant site noise limits for normal operations, based on PPGM, are met. The proposed development also complied with noise limits for temporary operations.

5.5.2 There are no changes to the proposed temporary operation so the findings are unchanged from the original assessment.

5.5.3 This updated assessment presents the noise assessment for the proposed revised scheme. The changes to the processing plant, mobile plant, bund formation and operations in Phase 1 have been reviewed with regard to noise. It remains concluded that, with the implementation of mitigation measures set out in this assessment, the proposed development would not result in significant adverse impacts with regard to normal and temporary operations

5.5.4 Overall, it remains concluded that with the incorporation of appropriate mitigation the Proposed Development complies with the relevant national and local planning policies in relation to noise. It is considered the Site is suitable for the Proposed Development and there is no reason on the grounds of noise why the development proposals should not be granted planning permission.

6 Air Quality and Dust

6.1 Introduction and Policy Context

6.1.1 This chapter presents an update and review of the Air Quality and Dust Effects chapter in the Original ES (Chapter 11), structured against the same section headings as far as possible for ease of comparison. The Air Quality and Dust Effects Chapter was supported by a Dust Impact Assessment (Technical Appendix E) which included an Air Quality Assessment.

6.1.2 The review has primarily considered the implications of the proposed revised scheme with regards to dust and air quality aspects. The review has also considered any changes in relevant policy, legislation and guidance in relation to dust and air quality, along with any changes in baseline conditions, that have occurred since preparation of the Original ES. Any such identified changes have been assessed to determine the potential implications on the original assessment findings and presented mitigation recommendations and are discussed in the following Chapter. Where necessary revised assessment and mitigations options are provided.

National Planning Policy Framework

6.1.3 The National Planning Policy Framework (NPPF) continues to set out the Government's planning policies for England and how these are expected to be applied. The NPPF has been revised since the Original ES. However, these revisions do not substantially affect how local air quality is considered in the planning regime or affect the original assessment and conclusions. The principal national planning policies and text continue to be:

- NPPF Section 15, and Planning Practice Guidance: Air Quality (nPPG-AQ)[5];

6.1.4 Although not referred to in the Original ES other relevant national planning policy is provided as follows:

- Planning Practice Guidance on Minerals (PPG-M); in particular paragraphs 023-032; and
- National Planning Policy for Waste (NPPW); in particular paragraph 7 and Annex B.

Local Planning Policy

6.1.5 At the time of the Original ES the Worcestershire Minerals Local Plan (2018-2036) and Wyre Forest Local Plan 2016-2036 both formed emerging policies. These have both since been adopted. Key relevant policies within these are:

- Worcestershire Minerals Local Plan (2018-2036): Policy MLP 28; and

[5] Department for Levelling Up, Housing and Communities, published 6 March 2014, last updated 1 November 2019

- Wyre Forest Local Plan 2016-2036 Policies SP.16, SP.33 and SP.34.

6.1.6 Further local planning policy of relevance is:

- Worcestershire Waste Core Strategy Development Plan Document 2012-2027: in particular Policy WC14 Amenity.

6.1.7 The thrust of these policies is to reduce the impacts of dust emanating from the site in order to protect the amenity of sensitive properties. Although not extant guidance, former mineral planning guidance, in MPS1 and MPS2, also advises on controlling the effects of development and keeping impact to a minimum.

6.1.8 The key planning principle relating to dust remains that emissions should, as far as possible, be controlled, mitigated or removed at source. The degree of assessment required is influenced by the type and scale of working and the proximity of sensitive land uses in the surrounding areas. Dust Assessment Studies should identify the operations and/or processes likely to give rise to dust and make recommendations for measures of mitigation which the MPA and the site operator could agree on for effectively controlling dust emissions.

Legislation

6.1.9 In April 2023 the UK Government published the 2023 Air Quality Strategy (2023 AQS) fulfilling the statutory requirement to set out air quality standards, objectives and measures for improving ambient air quality every 5 years. The 2023 AQS sets out a framework to enable local authorities to contribute to long-term air quality goals, and sets out air quality standards, objectives and measures for improving ambient air quality. Previously established standards and objectives for nitrogen dioxide (NO_2), nitrogen oxides (NO_x) and particulate matter of less than 10 µm aerodynamic diameter (PM_{10}) remain as detailed in the Technical Appendices to the Original ES. However, the 2023 AQS also included new standards for fine particulate matter (particulate matter of less than 2.5 µm aerodynamic diameter ($PM_{2.5}$) as have been established under the Environment Act 2021 and the Environmental Targets (Fine Particulate Matter)(England) Regulations 2023.

6.1.10 The resulting current air quality objectives (AQOs) of relevance to the Site and Proposed Development with regards to the protection of human health are summarised below in Table 6.1.

Table 6.1: Relevant Air Quality Objectives, Standards and Target Values

Pollutant	AQAL	Averaging period
Current Standards		
NO_2	40 µg/m^3	annual mean
	200 µg/m^3	hourly mean, not to be exceeded more than 18 times per annum
PM_{10}	40 µg/m^3	annual mean
	50 µg/m^3	24 hour mean, not to be exceeded more than 35 times per annum
$PM_{2.5}$	20 µg/m^3	annual mean

Pollutant	AQAL	Averaging period
Current Standards		
	% reduction relative to average exposure indicator (AEI), dependant on initial concentration; to at least 18 µg/m^3	annual mean
Future Standards[1]		
$PM_{2.5}$	12 µg/m^3 (interim target; *to be achieved by 2028)*	annual mean
	reduction in population exposure of 22% compared to 2018 *by 2028*	annual mean
	10 µg/m^3 (legal target; *to be achieved by 2040)*	annual mean
	reduction in population exposure of 35% compared to 2018 *by 2040*	annual mean

1: New standards established since the Original ES

6.1.11 The responsibility for meeting the current and new $PM_{2.5}$ targets remains with national government although local authorities have a role in delivering reductions in $PM_{2.5}$. At the time of preparation of this Addendum guidance on how the new $PM_{2.5}$ targets are to be integrated into the planning system is awaited.

National Best Practice and Guidance

6.1.12 Key current national best practice and guidance of relevance to the assessment is as follows:

- Defra, Local Air Quality Management Policy Guidance LAQM PG(22), August 2022
- Defra, Local Air Quality Management Technical Guidance, LAQM TG(22), August 2022
- Institute of Air Quality Management (IAQM): Planning for Air Quality, 2017, v1.2;
- Institute of Air Quality Management (IAQM): Guidance on the Assessment of Mineral Dust Impacts for Planning, May 2016, v1.1; and
- Institute of Air Quality Management (IAQM), Guidance on the Assessment of Dust from Demolition and Construction, 2024, v2.2;

6.1.13 The Defra LAQM Policy Guidance and Technical Guidance have been revised since the Original ES. These changes have been primarily aimed at strengthening the LAQM framework to enable greater action on air pollution. These revised versions do not specifically affect the air quality assessment methodology as presented in the Original ES and supporting appendices.

6.1.14 The IAQM guidance on the assessment of dust from demolition and construction has also been revised since the Original ES. A key change is in relation to the screening distance referred to indicate when a dust assessment would be required in relation to the presence of human receptors to a Site boundary. This has been reduced from 350m to 250m. However, the revisions do not specifically affect the air quality assessment methodology as presented in the Original ES and supporting appendices.

6.1.15 Irrespective of the updates and changes to the policy and guidance documents detailed above

the broad approach to the assessment and evaluation of significance methodologies remain as applied to the dust and air quality assessments presented in the Original ES.

6.1.16 The principal approach remains in accordance with the source-pathway-receptor concept considering the potential magnitude of a release (the source potential), the effectiveness of the pathway (i.e. dispersion of a pollutant towards a receptor) and the sensitivity of a receptor.

6.2 Update of Baseline Conditions

6.2.1 The following section considers any changes to the site setting since the Original ES along with any updated information on local air quality.

Site Setting and Surroundings

6.2.2 There has been little change to the immediate site setting since the Original ES. Receptors considered in the Dust Impact Assessment comprised those nearest the Site boundary, including the Bungalow, South Lodges, Broom Cottage, properties on Brown Westhead Park and at Castle Barns, Heathfield Knoll School and First Day Steps Nursery along with Brown Westhead Park and Playing Fields. Other receptors such as Lea Castle Equestrian Centre, Keepers Cottage and Strong Farm were effectively subsumed by these closer receptors.

6.2.3 Since the Original ES an additional 4 dwellings have been constructed on Brown Westhead Park to the west of the Site under planning permission granted in 2020 (ref: 20/0217/FULL). These have been constructed between other dwellings that were existing at the time of the Original ES, although are slightly closer to the proposed extraction boundary than existing properties.

6.2.4 In the wider area construction has commenced, and remains on-going, at the former Lea Castle Farm Hospital (Lea Castle Village; planning ref: 17/0205/OUTL). This comprises an extensive mixed-use development that extends to about 450m to the east of the proposed mineral extraction area. In addition, residential development of up to 91 has occurred at Land off Stourbridge Road extending to about 660m of the proposed mineral extraction area (planning ref: 18/0163/FULL).

6.2.5 Since the Original ES a planning application has also been submitted to WFDC for the wider Lea Castle Farm Hospital site (wider Lea Castle Village; planning ref: 22/0404/OUT) and is currently awaiting determination. This includes land to the west of the currently consented Lea Castle Village, extending to within 230m of the proposed mineral extraction area.

6.2.6 There are no known changes in relation to the nature conservation sites that were considered in the Original ES.

Existing Air Quality

6.2.7 The Original ES and supporting Technical Appendix referred to baseline air quality data

obtained via published sources where this included Defra issued predicted background pollutant mapping data and local authority monitoring data. Updated data is briefly summarised below in Table 6.2.

Table 6.2: Status of relevant Local Air Quality Data

	Original ES & Supporting Technical Appendices	Current Status (July 2024)
Defra Air Quality Background Maps	Predicted background data provided for 1km x 1km grid squares across the UK; based on 2015 ambient monitoring and meteorological data and information at the time on age and distribution of vehicle and emission factors Data for 2018, 2023 and 2028 presented in Technical Appendices E and F	Predicted background data has been updated and is currently based on 2018 ambient monitoring and meteorological data and information at the time on age and distribution of vehicle and emission factors Data for 2024 and a future year of 2029 presented below
Local Authority Assessment and Review	Information presented on WFDC Air Quality Management Area (AQMA) status	Air Quality Annual Status Reports (ASRs) produced by WFC since 2018, including 2024 ASR providing update AQMA status. Most recent key observations discussed below.
Local Authority Monitoring Data	WFDC air quality monitoring data for NO_2 presented in Technical Appendix F for monitoring location SBR121 for 2018	Monitoring for NO_2 undertaken by WFDC at additional locations near SBR121. Data for 2018-2023 presented below

Air Quality Management Areas (AQMAs)

6.2.8 At the time of the Original ES WFDC had declared two AQMAs within its administrative area. These had both been declared due to elevated levels of annual mean NO_2. These were:

- Kidderminster Ring Road (Horsefair / Coventry Street), and,
- Welch Gate

6.2.9 Of these the Kidderminster AQMA was the closest, being 1.7km north of the Site, and the most relevant to the assessment.

6.2.10 This AQMA declaration remains in place and has not been amended. It is understood however that construction of a new road layout was completed in 2021 in this area and is expected to substantially improve air quality. The latest WFDC Air Quality Annual Status Report (2024 ASR), which reports local air quality monitoring results up until the end of 2023, reports that the latest results indicate that these measures have had a significant reducing benefit, with all

measured annual mean NO_2 concentrations within the AQMA being below the AQO. However, it is also noted in the ASR that the highest annual concentration measured in the Horsefair / Coventry Street AQMA in 2023 remains within 10% of the annual objective (at 38.6 µg/m^3 compared to the AQO of 40 µg/m^3), and so WFDC are not currently proposing to revoke this AQMA.

Air Quality Background Maps

6.2.11 Technical Appendix E referred to Defra predicted background data for certain pollutants. This data is published for 1km-by-1km grid squares across the UK. Current available data for 2024 and a future year, 2029, for the key pollutants of interest are summarised below.

Table 6.3: Defra Predicted Background Air Quality Data[1]

Grid Square	Location	Annual Mean Concentrations (µg/m^3)			
		NO_2	NO_x	PM_{10}	$PM_{2.5}$
2024					
383500 279500	Site (west), Brown Westhead Park	6.78	8.66	11.05	7.18
383500 278500	Site (south-west), South Lodges, Heathfield Knoll School & First Steps	7.07	9.04	11.00	7.29
384500 279500	Site (east), The Bungalow, Lea Castle Barns	7.24	9.27	11.28	7.40
384500 278500	Site (south-east), Broom Cottage	7.69	9.87	11.88	7.65
2029					
383500 279500	Site (west), Brown Westhead Park	6.21	7.90	10.86	7.02
383500 278500	Site (south-west), South Lodges, Heathfield Knoll School & First Steps	6.41	8.16	10.81	7.13
384500 279500	Site (east), The Bungalow, Lea Castle Barns	6.53	8.32	11.08	7.25
384500 278500	Site (south-east), Broom Cottage	6.81	8.69	11.68	7.50
AQAL		**40**	**30 (v)**	**40**	**20 (12)[2]**

(v) – established for the protection of vegetation
1: Data released by Defra in 2020 based on 2018 ambient monitoring and modelling
2: Future interim target for $PM_{2.5}$ to be achieved by 2028.

6.2.12 Background concentrations of these pollutants continue to be predicted to fall over time.

Local Air Quality Monitoring Data

6.2.13 Technical Appendix F referred to WFDC air quality monitoring data for annual mean NO_2 concentrations from a diffusion tube located on Stourbridge Road (ref: SBR121), located about 1.9km to the south of the Site. The latest WFDC ASR also reports monitoring data for several additional diffusion tubes located along Chester Road North near to SBR121. Monitoring at

these commenced in 2019 and the available results are summarised below.

Table 6.4: Diffusion Tube Monitoring Data

Ref.	Location	Grid ref.	Type	Annual Mean NO_2 Concentrations (µg/m^3)					
				2018	2019	2020[1]	2021[1]	2022	2023
SBR121	121 Stourbridge Road	383905 277857	roadside	32.2	27.0	22.6	25.8	29.2	28.3
334CRN[2]	334 Chester Road North	383965 277823	roadside		29.0	26.4	29.3	33.3	33.5
294CRN[2]	294 Chester Road North	384054 277444	roadside		20.0	16.3	18.0	20.3	19.5
383CRN[2]	383 Chester Road North	384175 277275	roadside		18.3	15.7	16.4	18.7	18.0
239CRN[2]	239 Chester Road North	384221 276911	roadside		19.2	16.2	17.0	20.2	19.2
CSLOC	Coventry Street	384726 276909	roadside	32.5	27.6	23.4	24.2	27.3	26.5

1: Monitoring data for 2020 and 2021 will be influenced by the impacts of the Covid-19 pandemic on local traffic movements
2: Monitoring commenced in 2019

6.2.14 The locations of these monitoring locations in relation to the Site are provided in Figure 6.1.

6.2.15 The annual mean NO_2 concentrations in 2019 were all well below the AQO. Concentrations were typically lower in 2020 and 2021 consistent with expectations due to reduced traffic movements in this time due to the impacts of the Covid-19 pandemic affecting travel patterns and behaviour. Annual concentrations have risen in 2022 and 2023, when compared to 2020 and 2021, again consistent with expectations of increasing traffic movements following the easing to the Covid-19 restrictions.

6.2.16 However, irrespective of this the results for 2023 remain broadly similar to 2019 with all locations were well below the AQO of 40 µg/m^3 (<75% of the AQO).

6.2.17 At the time of the Original ES WFDC did not undertake any monitoring for PM_{10} or $PM_{2.5}$ within its' area and the assessments referred to the available Defra predicted background data. However, in 2022 WFDC commenced monitoring for PM_{10} and $PM_{2.5}$ (and NO_2) at a location within the Horsefair AQMA in Kidderminster using a Zephyr Air Quality Monitor. This is a low-cost continuous analyser that provides 'indicative' monitoring data; it is not approved by Defra for reference against Air Quality Standards and Objectives and the results have been included in the 2023 ASR by WFDC for information only. Details are provided below in Table 6.5.

Table 6.5: Summary of WFDC Data for PM_{10} and $PM_{2.5}$

Site ID	Location	Grid Ref	Type	Annual Mean Concentrations (µg/m³)		
				NO_2	PM_{10}	$PM_{2.5}$
2022						
Horsefair Zephyr	Horsefair AQMA	383319 277122	Roadside[1]	25.0	14	14.0
2023						
Horsefair Zephyr	Horsefair AQMA	383319 277122	Roadside[1]	25.3	13	11.8

1: Described in WFDC ASR as being 1.6m from the kerb of the nearest road

6.2.18 The measured annual mean concentrations of PM_{10} and $PM_{2.5}$ at the Zephyr analyser are each well below the relevant existing AQOs (noting though that these results are 'indicative' and not be directly compared to the AQOs). It is also noted however that in 2022 the measured $PM_{2.5}$ concentrations are the same as PM_{10} at 14.0 µg/m³. However, $PM_{2.5}$ would only form a proportion of PM_{10} and hence there is a degree of uncertainty regarding these results.

6.3 Potential for Impact

Proposed Scheme Changes

6.3.1 Full details of the changes to the proposed soils placement scheme and processing plant are summarised elsewhere in this ES Addendum. The changes of potential relevance to the air quality and dust assessments are:

- Reduction in processing plant height from 12m to 6.334m;
- Reduction in processing plant footprint from 2,752m³ to 451m³
- Reduction in height of several bunds (Bunds 3, 7, 13, 14, 16 and 19);
- Reduction in the duration in time for Bund 7;
- Bunds 6, 11 and 18 no longer required; and
- Placement of a stretch of hedgerow / hedgerow trees adjacent to the eastern margin of Phase 4 during the Initial Works (Year 1) as opposed to the Final Works (Year 10). Bunds 1-4 however remain proposed for the duration of the scheme.

6.3.2 Bund 3 is to be constructed on the western edge of the plant site prior to the commencement of extraction. Although the height of Bund 3 is to be reduced from 4m/6m to 3m it is still to be retained for the duration of the development until final restoration. Bunds 1, 2 and 4,

which are to be sited on the northern and southern edges of the plant site, are also still to be constructed prior to the commencement of extraction and retained for the duration of the development until final restoration.

6.3.3 As previously Bunds 1-4 are all to be seeded on construction and maintained.

6.3.4 As noted in Chapter 2, the revised scheme does not result in any changes to the length of time of mineral extraction, its cessation or the final restoration of the site. Similarly, it does not result in any changes to the proposed extent of extraction or the methods of working.

6.3.5 The revised scheme would not result in any changes to the expected HGV and LGV movements to / from the Site during the duration of the development.

6.3.6 The implications of these changes in the soils placement scheme and processing plant on the original presented dust assessment are discussed below.

Dust Impact Assessment

Summary of Original ES Assessment

6.3.7 The Dust Impact Assessment considered the likelihood of dust (airborne particular matter) that may be generated by the proposed development to result in adverse impacts and resulting effects at receptors. Airborne particulate matter ranges in size from a few nanometers to around 100 µm. The larger particles, mostly those greater than 30 µm, may give rise to disamenity effects and ecological effects through deposition.

6.3.8 The dust assessment took into account the potential sources of dust associated with the Proposed Development and the potential pathway from these sources to the nearby identified receptors. Sources considered included soil stripping, storage and restoration, mineral extraction, loading and stripping, internal haulage, crushing and screening, aggregates stocking, on-road transport and wind-blow across exposed surfaces and stockpiles. The assessment considered these activities and likely duration, distance over which impacts may occur, degree of screening and long-term frequency of wind directions.

6.3.9 The Bungalow and properties at Castle Barns lie downwind of the prevailing wind direction across the Site. The Original ES assessment concluded there could be a risk of *moderate* adverse effects, at most, arising from deposition dust at the Bungalow if mitigation and control measures were not implemented. As the screening bunds establish and quarrying activities move away from the boundary and deepen within the quarry potential impacts would fall to *slight* to *negligible* at this property.

6.3.10 This is also of relevance with respect to the properties at Castle Barns where the assessment concluded *slight* adverse effects at most. Potential impacts and resulting effects would reduce to *negligible* throughout the works that are further away from these properties.

6.3.11 The assessment concluded *negligible* effects at all other considered human receptors,

including South Lodges, Broom Cottage, Heathfield Knoll School, and First Steps, Brown Westhead Park and the Bungalow.

6.3.12 The Original ES however set out a series of dust control measures, as discussed further below, and concluded that with the incorporation of these mitigation measures, this would effectively mitigate any potential dust impacts.

6.3.13 The assessment concluded *negligible* effects at all considered nature conservation receptors due to potential dust deposition.

Update Dust Assessment

6.3.14 There have not been any particular changes to planning policy, legislation or guidance that would affect the Original ES dust assessment.

6.3.15 The revisions to the proposed processing plant would not significantly affect the potential for the proposed operations to give rise to dust. The processing of sand and gravel is a 'wet' process and the Original ES concluded there was a 'small' dust source potential from processing operations. The greatest source of potential dust generation associated with sand and gravel processing operations tends to be from accumulated material on the ground that may dry out and give rise to dust when trafficked over. Although the revised plant is of a smaller footprint it would process the same throughput of material as for the original proposals and the source potential remains similar.

6.3.16 The plant is to be sited within the initial void at a floor base of c.63.5m aod. At a lower height of 6.334m compared to the original scheme the top of the plant would be at a similar level to the surrounding ground level (c.70m) providing increased shielding from the wind. The use of the smaller plant would therefore potentially result in a reduced source potential to that originally assessed although this would not affect the results of the original assessment.

6.3.17 As per the previous scheme Bunds 1-4 which are to be provided to the plant site would be retained for the duration of the development. The other bunds are to be temporary during extraction operations in each phase. All bunds are to be of at least 3m in height. Although the bunds can serve to provide screening to minimise off-site migration of any dust generated during the works, the primary mitigation is achieved through other physical and management measures. These measures are discussed in further detail below in Section 6.4. The reduced heights to Bund 3 and some temporary soil storage bunds would not result in an increased risk of off-site migration. The height reduction would however result in a slight reduced potential for generation of dust during the bund creation, but again would not affect the results of the original assessment.

6.3.18 The revisions to the proposed soil placement scheme and processing plant would not therefore significantly affect the potential for the proposed operations to give rise to dust or result in off-site migration.

6.3.19 It therefore remains concluded that the implementation of standard mitigation and control measures would effectively mitigate any potential dust impact.

Change to Site Setting

6.3.20 The newly constructed properties on Brown Westhead Park are slightly closer to the proposed extraction boundary than the existing properties. However, they are well screened by existing trees and topography and are located upwind of the Site. Resulting effects are *negligible* as for the existing properties for both the original and the revised scheme.

6.3.21 Construction of new dwellings is also now complete at Land of Stourbridge Road development and appears largely complete at the Lea Castle Farm Hospital (core site) development discussed above in paragraph 6.2.4. Both these developments lie over 250m from the proposed development, beyond the screening distance provided in IAQM Guidance on Mineral Dust for considering disamenity dust effects from sand and gravel quarries. Hence the risk of adverse dust effects from the Proposed Development on new receptors introduced as part of these two new housing developments is *negligible*.

6.3.22 The planning application for the wider Lea Castle Village development that extends to within 230m of the proposed extraction area is currently awaiting determination. Hence this could introduce some new receptors to within the screening distance of 250m if consented. However, this would only occur if the western-most phases of the proposed Lea Castle Village development were occupied whilst mineral extraction and restoration occurred in the eastern most phases of the Proposed Development. Even if this was to occur, the given the distance and screening provided, the resulting effects of any dust generated by the proposals would be *negligible*.

PM_{10} Assessment

6.3.23 The fugitive dust (particulate matter) that could be generated by the proposed development will include a proportion of finer particulate matter (suspended particulate matter). Particles of aerodynamic diameter below 10 µm (referred to PM_{10}) correspond to the inhalable fraction which, depending on the nature and concentration of the particles, can be associated with adverse health impacts. PM_{10} comprises both fine (those particles of less than 2.5 µm diameter ($PM_{2.5}$)) and coarse (diameter between 2-10 µm; $PM_{2.5-10}$) fractions of airborne particulate matter. These normally arise from different sources. For quarrying activities the greater proportion of suspended dust would be in the coarse sub-fraction ($PM_{2.5-10}$) rather than the fine sub-fraction ($PM_{2.5}$).

6.3.24 Although these smaller particles may remain suspended in the air and travel for longer distances than larger particles, they will also be subject to dispersion thereby reducing concentrations away from a source. The greatest potential impacts would also be within 100m of a source as for disamenity dust.

Summary of Original ES Assessment

6.3.25 The Original ES included a PM_{10} assessment. This assessment assumed an additional load of 1 µg/m^3 PM_{10} and 0.5 µg/m^3 $PM_{2.5}$ attributable (each as an annual mean) to the proposed operations to the existing background levels. With the contribution of 1 µg/m^3 and 0.5 µg/m^3 respectively to the predicted background concentrations the resulting total PM_{10} and $PM_{2.5}$ annual average concentrations were concluded to remain well below the relevant AQOs.

Update Assessment

6.3.26 The revisions to the soil placement scheme and processing plant would not significantly affect the potential for the proposed operations to give rise to PM_{10} and $PM_{2.5}$. These revisions would not therefore alter the original assessment as presented.

6.3.27 With reference to Table 6.3 background concentrations in PM_{10} and $PM_{2.5}$ are predicted to fall over time. In addition revised predicted background concentrations have been issued by Defra based on more up to date modelling and monitoring. For example, the predicted PM_{10} concentrations for the grid square which includes South Lodges was 12.79 µg/m^3 for 2018 and 12.46 µg/m^3 for 2023 at the time of the Original ES. It is now predicted to be 11.13 µg/m^3 for 2023 and 11.00 µg/m^3 for 2024. The Defra data in Table 6.3 predicts annual mean background concentrations of 11.05-11.88 µg/m^3 for PM_{10} and 7.18-7.65 µg/m^3 for $PM_{2.5}$ for 2024 in the locality. Hence, it remains the case that assuming an additional contribution of 1 µg/m^3 PM_{10} and 0.5 µg/m^3 $PM_{2.5}$ to these background concentrations the resulting total concentrations PM_{10} and $PM_{2.5}$ would remain well below the AQOs.

6.3.28 The new future targets for $PM_{2.5}$ are noted. Current predicted background $PM_{2.5}$ concentrations in the area are well below both the interim target established for 2028 and legal target established for 2024. Assuming a contribution of 0.5 µg/m^3 to background concentrations total $PM_{2.5}$ concentrations remain well below these targets.

6.3.29 Further guidance is provided in the IAQM Guidance on Mineral Dust which advises that where the long-term background PM_{10} concentration is less than 17 µg/m^3 there is little risk that additional contributions from a mineral site would lead to an exceedance of the annual mean air quality objective. The guidance advises that if this is the case then no further consideration is typically required. This is conservative as this guidance is provided for all mineral sites.

6.3.30 As noted above the Defra data predicts annual mean background concentrations in the locality to be well below this recommended screening value of 17 µg/m^3. On this basis no further consideration of potential PM_{10} impacts from Proposed Development would be required.

6.3.31 It is recognised that annual mean PM_{10} (and $PM_{2.5}$) concentrations may be higher than the general predicted background levels at some receptors, however there are none that are in close proximity to any particular sources that could lead to substantially higher levels. The closest properties to the Site, including those at Castle Barns for example, are set back at least

40m from the roadside of the A449. Others are closer to Wolverley Road, but with measured traffic flows of <10,000 AADT (9,840 AADT provided for 2020 baseline) these would not be expected to be subject to high levels of PM_{10}.

6.3.32 Contributions of PM_{10} (and $PM_{2.5}$) from any fugitive dust from the proposed development to local air quality at relevant receptors is not therefore considered to result in significant adverse effects.

Traffic Emissions Assessment

Summary of Original ES Assessment

6.3.33 The Original ES included a detailed assessment of emissions arising from HGVs travelling to / from the Site and potential impacts. This included atmospheric dispersion modelling of vehicle exhaust emissions (NO_2, PM_{10} and $PM_{2.5}$) and assessment of potential impacts at receptors near the affected local road network.

6.3.34 The assessment concluded there would be *negligible* impacts due to increases in NO_2 concentrations at all modelled receptors other than at a single location on Wolverhampton Road (modelled receptor SR6) where a *slight* adverse impact was predicted. Potential impacts due to increases in PM_{10} and $PM_{2.5}$ concentrations were *negligible* at all modelled receptors.

6.3.35 The overall impact was concluded to be *negligible*.

6.3.36 It is noted that the assessment was conservative in that it assumed no improvements in the background air quality concentrations or vehicle emission factors from the 2018 scenario.

Update Traffic Emissions Assessment

6.3.37 The revisions to the soil placement scheme and processing plant would not result in any changes to the numbers of HGVs travelling to / from the Site.

6.3.38 As discussed above in Section 6.3 there is however now additional information available on local air quality in the wider area. In addition, revised UK vehicle fleet composition and emissions factors have been issued since the Original ES; the latest information being released in 2024. Further consideration of the potential impacts of HGV emissions on local air quality is therefore provided below as an update to the Original ES and Technical Appendix E.

6.3.39 As detailed in the Original ES: Technical Appendix F: Transport the proposals would result in an additional 116 2-way HGV movements (58 in / 58 out) per day (as Annual Average Daily Traffic (AADT)) and 17 2-way LGV movements per day (as AADT). If it is assumed 25% of sand and gravel exports are transported on a back-haul basis, the number of 2-way HGV movements would reduce to 96 as AADT.

6.3.40 All movements to / from the Site would be via Wolverley Road to the east of the access road.

6.3.41 It is predicted that 60% of the development HGVs would travel to / from the north and 40%

to / from the south. Of those travelling to / from the north these would be distributed via the A449 Wolverhampton Road (north of Wolverley Road) and Park Gate Road / A451 Stourbridge Road.

6.3.42 Of those HGVs travelling to / from the south 60% are predicted to travel via the A449 Chester Road North / to the east of Kidderminster and 40% via the A451 Stourbridge Road / Ring Road close to Kidderminster town centre. The potential distribution of HGVs is shown in Figure x.

6.3.43 The IAQM guidance on air quality and planning provides screening criteria for additional traffic movements to be introduced as part of a development above which an air quality assessment is advised. Such an assessment may take the form of a simple or detailed assessment depending on factors such as the sensitivity of the area, proximity of sensitive receptors to the affected road network etc. The screening criteria for HGVs are +100 AADT where distant from an AQMA and +25 AADT where within or close to an AQMA.

6.3.44 The greatest number of HGVs would be experienced along the access road and Wolverley Road to / from the junction with the A449. Thereafter the movements would be dispersed as shown on Figure 6.2. At 116 HGV AADT movements along Wolverley Road are above the screening criteria of +100 HGV AADT provided in IAQM guidance as indicating a need for an air quality assessment. However, as noted above this assumes no back-haul; if a proportion of back haul is assumed then flows are below the screening criteria.

6.3.45 The only receptors along this stretch of road would be Broom Cottage and Four Winds. The façade of Broom Cottage is within 2.5m of the roadside, whereas that of Four Winds is set-back at least 23m. Greatest potential impacts may therefore be expected at Broom Cottage, as pollutant concentrations fall rapidly from source, including road traffic. Traffic flows along this road for 2018 - 2020 are given as <10,000 AADT. Given the nature of this stretch of road (no traffic lights, bus stops or other sources of congestion and idling traffic) and based on air quality monitoring data for roads within Kidderminster itself as discussed above, pollutant concentrations would be expected to be well below the relevant AQOs (<75%).

6.3.46 The additional contributions of NO_2, PM_{10} and $PM_{2.5}$ to façade concentrations from the 116 HGV AADT would not be expected to result in significant adverse impacts at these properties, as determined through the Air Quality Assessment carried out for the planning application.

6.3.47 HGV movements would be dispersed on the wider road network with all movements beyond the Wolverley Road / A449 junction being less than the IAQM screening criteria for where outside an AQMA.

6.3.48 It is predicted that 19 HGVs (as AADT) would travel along Stourbridge Road to / from Kidderminster itself, and hence potentially through the existing Kidderminster AQMA (assuming no back-haul). This is also below the more stringent screening value of +25 HGV AADT that is provided in IAQM guidance as indicating a need for an air quality assessment.

6.3.49 Potential quarry related LDV movements are well below the relevant IAQM screening criteria of +500 LDV AADT where distant from an AQMA and +100 LDV AADT where within or close to an AQMA.

6.3.50 On this basis it is considered that the contribution of the proposed quarry related HGV exhaust emissions to the local air quality would **not be significant**, as determined through the submitted air quality assessment.

6.4 Potential for Mitigation

Dust Impact

6.4.1 The original scheme of mineral extraction was designed with extensive in-design mitigation measures. These included construction of siting the processing plant at depth within the void; provision of hardstanding at the site access and processing plant; use of a conveyor to transport material from Phases 1-3 to the processing area; provision of soil screening bunds to the northern, western and southern edges of the plant site; planting of a woodland block in the northeast corner with enhancement to existing hedgerows; and provision of appropriate stand-offs between extraction and off-site sensitive receptors.

6.4.2 These measures were supplemented by a series of proposed dust suppression measures set out in the Original ES and supporting Technical Appendix E.

6.4.3 These in-design and management measures are retained as part of the revised scheme. It remains expected that should planning permission be granted, conditions would be imposed mandating that the Site be operated in accordance with a Dust Management Plan (DMP). Such a DMP would be subject to agreement with the MPA and subject to regular review process. In addition, the importation, handling and placement of inert waste materials for the restoration would be regulated by the Environment Agency (EA) under an Environmental Permit.

6.4.4 Such mitigation measures include, but are not limited to:

- Regular visible inspections of the site and local road network;
- Regular maintenance of haul roads;
- Maintenance of a Site speed limit;
- Use of a road sweeper as and when required;
- Minimization of drop-heights during loading / unloading of dump trucks;
- Provision of a wheelwash for all departing HGVs;
- Use of dust suppression as and when required;
- Mobile pant exhausts and cooling fans to point away from ground; and

- Maintenance of complaints log and response procedure.

6.4.5 In addition, as noted in the amended ES NTS submitted in 2021, physical dust deposition monitoring would be undertaken. The detailed scope of such dust monitoring would be subject to agreement with the MPA.

PM_{10} Assessment

6.4.6 The in-design measures and proposed dust mitigation measures would also serve to reduce potential PM_{10} (and $PM_{2.5}$) emissions. Hence, taking into account the nature of the sand and gravel quarry, the proposed mitigation measures, location and orientation of receptors and background air quality, as discussed above with regards to disamenity dust, no further assessment is deemed necessary. Contributions of PM_{10} (and $PM_{2.5}$) from any fugitive dust from the proposed development to local air quality at relevant receptors is not therefore considered to result in significant adverse effects.

6.5 Air Quality and Dust Conclusions

Summary of Original ES Assessment

6.5.1 The original ES concluded that it is unlikely that any significant decrease in local air quality will occur due to the proposed development at Lea Castle Farm Quarry. Any dust occurrence event will be limited and of short duration and will be minimised by implementation of the dust control recommendations.

6.5.2 With regards to PM_{10} and $PM_{2.5}$ dust levels from the site, analysis was made of the air quality data. The conclusion of the analysis was that AQO will not be exceeded.

6.5.3 Overall, the effect on air quality of the proposed development with the implementation of suitable dust mitigation measures was considered to be not significant.

Update Assessment

6.5.4 The changes to the processing plant and soils placement scheme have been reviewed along with changes in legislation, policy and baseline air quality conditions since the Original ES.

6.5.5 It remains concluded that, with the implementation of standard dust mitigation and control measures, the proposed development would not result in significant adverse impacts and effects due to dust on local receptors, both with regards to dis-amenity dust and PM_{10} / $PM_{2.5}$.

6.5.6 Emissions associated with HGV and LGV movements to / from the site are also not predicted to result in significant adverse impacts on local air quality.

6.5.7 Overall, it remains concluded that with the incorporation of appropriate mitigation the Proposed Development complies with the relevant national and local planning policies in relation to air quality and dust. It is considered the Site is suitable for the Proposed

Development and there is no reason on air quality grounds why the development proposals should not be granted planning permission.

7 Archaeology and Cultural Heritage

7.1 Introduction and Policy Context

7.1.1 This chapter presents a review of the Archaeology and Cultural Heritage chapter in the Original ES (Chapter 14), structured against the same section headings for ease of comparison.

7.1.2 The development plan and other material considerations contain policies and text concerning cultural heritage issues in connection with development proposals. In particular:

- NPPF section 16;
- Worcestershire Minerals Local Plan (2018-2036) Policy MLP 32; and
- Wyre Forest Local Plan 2016-2036 Policy SP.21.

7.1.3 The thrust of these policies is consistent with the advice in the NPPF to protect, conserve and enhance diverse historic character and manage change in such a way that respects local character and distinctiveness. The policies seek to protect sites of cultural heritage importance and their settings and preserve Listed Buildings, their setting and historical context. The policies set out the need for evaluation of the full effects of the development proposal.

7.2 Potential for Impact

7.2.1 The Original ES identified the potential impact of extraction activities on buried archaeological remains of sufficient interest that they be identified as non-designated heritage assets. While the surveys completed to date have not revealed any definitive evidence for surviving, buried archaeological remains of interest within the Appeal Site, further investigations are proposed, via a condition of a consented scheme, to mitigate any adverse impacts. The assessment of impacts and proposal for further work is entirely consistent with industry best practice.

7.2.2 The Original ES also identified the sensitivities of the proposed development altering the settings of proximate heritage assets (those both designated [Listed Buildings and Conservation Areas] and non-designated (buildings of local historic interest). The temporary and long-term impacts of this change was acknowledged. In summary, less than substantial harm was predicted to the Grade II Listed 'North Lodges and Gateway to Lea Castle', lying c250 to the north-east of the Appeal Site, because of changes to its setting. Other minor or non-significant impacts on non-designated heritage assets were also reported. The Inspector agreed with these conclusions as set out in the quashed Appeal Decision Notice (DL151-166)

7.2.3 Regarding any changes or updates to legislation, policy (national or local) and best practice (re impact assessment), since 2019, and solely in reference to archaeology and cultural heritage, none of these are material to the matters that warrant consideration during this re-

determined appeal.

7.2.4 There have been no material changes to the baseline environment that would result in any different conclusions being reached regarding the key heritage assets that could be affected by the Appeal Scheme.

7.2.5 The proposed changes to the scheme (when compared to that assessed in 2019), such as bund heights, bund locations, phasing during extraction and restoration; and the types of machinery that would be deployed, when considered individually and / or cumulatively would result in no material adverse or beneficial impacts.

7.2.6 Thus, for the purposes of the assessment of the Appeal Scheme, when compared to original scheme, the details presented within the Original ES are sound. However, it is worth noting that while the Original ES, and Inspectors Decision Letter (DL164-166) recognised and that the long-term restoration proposals would ameliorate the minor impacts or less than substantial harm, and in any case the remnant effects (harm) would be demonstrably outweighed by the public benefits, the specific 'heritage benefits' have been underplayed. The specific matter will be explored in greater detail as part of the submission of expert evidence for the Inquiry.

7.3 Potential for Mitigation

7.3.1 Should buried archaeological remains of interest be discovered during the course of further investigations their excavation, recording and analysis will better reveal their historic interest. The communication and dissemination of these findings in the context of the local, regional and national archaeological research agendas will deliver heritage benefits that more than compensate for the loss of any 'fabric' or in situ remains.

7.3.2 The long-term restoration proposals, including, amongst other details, the replanting of lost parkland avenues and Broom Covert, mitigate / ameliorate and (as noted above) deliver heritage benefits.

7.3.3 The changes to scheme (as noted above) will not warrant any revisions to the embedded or proposed mitigation measures.

7.4 Archaeology and Cultural Heritage Conclusions

7.4.1 The Original ES anticipated and reported no significant effects on designated or non-designated cultural heritage assets. Cultural Heritage was not identified as a reason for refusal in the original application. The Appeal Decision confirmed that any perceptions of harm to heritage assets would be demonstrably outweighed by the public benefits of the scheme, ensuring compliance with all legislative duties and national / local policy that seeks to safeguarded cultural heritage significance.

7.4.2 The proposed changes to Appeal Scheme will have no material effect on proximate heritage assets and would in no way alter the assessment or conclusions reported in the Original ES or in the Appeal Decision.

8 Climate Change

8.1 Introduction

8.1.1 This chapter presents a revision of the Climate Change Assessment chapter in the Original ES (Chapter 18). Since the preparation of the original ES, climate change effects and Greenhouse Gas Emissions has come very much to the forefront, particularly since the Finch vs Surrey County Council Supreme Court ruling (in R (Finch) v Surrey CC (2024)). This judgement decided that the proposed oil extraction project in Surrey should have included an assessment of the Scope 3 or downstream emissions of the project, because they were inevitably caused by it and readily assessed. The difference with sand and gravel extraction is that the minerals in question have no scope 3 or downstream emissions through their use. The utility of sand and gravel in construction arises because of their chemical inertness. In their downstream use, these minerals do not emit Greenhouse Gases.

8.1.2 To address climate change effects, DustScanAQ (herein DS) has been instructed by the Appellant to undertake an assessment of the Greenhouse Gas (GHG) emissions associated with sand and gravel extraction at Lea Castle Farm, and assess the risks of climate change on the development.

Objectives

8.1.3 The objective of the work is to provide a climate change assessment consistent with the requirements of the relevant environmental impact assessment legislation and government guidance.

8.1.4 The work includes a carbon assessment estimating the Greenhouse Gas (GHG) emissions associated with the sand and gravel extraction for the proposed development by assessing the emissions as a whole and per tonne extracted and comparing these with industry benchmarks.

8.1.5 Another work element is to determine the climate baseline of the site and to project the future baseline of annual average temperature, precipitation and wind.

8.1.6 The final part of the work is to determine the resilience of the site, site staff and site equipment to climate change considering four physical changes associated with climate change:

- An increase in winter precipitation;
- A decrease in summer precipitation;
- An increase in summer temperature; and
- An increase in extreme weather events.

Site Setting and Proposed Development Scheme

8.1.7 Full details of the proposed development are set out in Chapter 1 of the ES Addendum.

8.1.8 The proposed development is located in flood zone 1 – an area with a low probability of flooding from rivers and sea.

8.2 Legislation, Policy, Plans and Non-Statutory Guidance

8.2.1 This section of the report provides the relevant legislative, policy and guidance context for the climate change assessment of the Proposed Development.

International Framework

United Nations Framework Convention on Climate Change (UNFCCC)

8.2.2 The United Nations Framework Convention on Climate Change (UNFCCC) , one of the three 'Rio Conventions', was signed in 1992, effective from March 1994. The objective of the convention was to stabilise greenhouse gas (GHG) concentrations at a level that would prevent anthropogenic interference with the climate system. Such a level should be achieved within a sufficient time-frame to allow ecosystems to naturally adapt to climate change, not threaten food production and enable sustainable economic development.

8.2.3 The treaty is not legally binding but since its establishment, has provided the basis for international climate negotiations such as the Kyoto Protocol and the Paris Agreement and been used to set legally binding emissions limits, relevant to current UK legislation.

International Legislative Framework

The Paris Agreement (COP21)

8.2.4 The Paris Agreement was adopted by 196 Parties at the UN Climate Change Conference, COP21, in December 2015, enforced from November 2016. It supersedes the UNFCCC Kyoto Protocol, adopted in 1997 until the end of the second commitment period in 2020, the first international treaty to set legally binding targets to cut GHG emissions.

8.2.5 The Paris Agreement is a legally binding international treaty with the overarching goal to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels" and pursue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels." The agreement recognised the need that emissions needed to peak as soon as possible and there should be rapid reductions in GHG thereafter.

8.2.6 The latest COP event, COP28, was held in Dubai in late 2023.

National Legislative Framework

The Climate Change Act (2008)

8.2.7 Following the Paris Agreement, The Climate Change 2008 sets out the UK government's

targets, implemented through many strategies and policies, to reduce greenhouse gas emissions in both the UK and abroad. The Act committed the government to reducing greenhouse gas emissions to a minimum of 80% below the 1990 baseline by 2050. In 2019, the government pledged to improve this by setting a more ambitious target of becoming carbon neutral by 2050.

8.2.8 Strategies implemented since the Climate Change Act 2008, cover a wide range of sectors however little relates directly to the quarrying sector.

Planning and Compulsory Purchase Act (2004)

8.2.9 Section 19(1A) of the Planning and Compulsory Purchase Act 2004 places a legal duty on local planning authorities to include:

8.2.10 "…*policies designed to secure that the development and use of land in the local planning authority's area contribute to the mitigation of, and adaptation to, climate change*."

8.2.11 Local development plans are therefore required to consider climate change mitigation and adaptation in development proposals.

Town and Country Planning (Environmental Impact Assessment Regulations) (2017)

8.2.12 The amended 2014 EU 'EIA' directive 2014/52/EU was transposed into UK law by The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 and came into force in May 2017.

8.2.13 The EIA Regulations require appropriate consideration of climate change. This may include the impact of the project on climate by detailing the greenhouse gas emissions associated with the project, as well as the impact of climate change on the project. The specific wording of the legislation in Schedule 4 is:

8.2.14 '*A description of the likely significant effects of the development on the environment, resulting from, inter alia: …. (f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change*'

National Planning Policy

National Planning Policy Framework (2023)

8.2.15 Paragraph 8 of the NPPF confirms the three overarching objectives in order to achieve sustainable development; economic, social and environmental.

8.2.16 The environmental objective is the one which is directly related to the climate change assessment and states: to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

Local Planning Policy

8.2.17 Worcestershire County Council (WCC) has mineral planning policies addressing climate change.

8.2.18 The WCC Minerals Local Plan 2018-2036 does not have a standalone policy on climate change. The issue is addressed in the plan's vision and specifically in policies MLP7 Green Infrastructure, MLP38 Flooding and MLP 39 Transport.

8.2.19 WCC declared a climate emergency in July 2021. The council publishes reports on its progress towards net zero for its own activities.

8.2.20 Wyre Forest District Council, the local authority for non-mineral planning policy, has planning and land use policies which refer to or have implications for climate change.

NRS Environmental Management

8.2.21 NRS is accredited to ISO 14001:2015 for environmental management. This requires NRS to use and apply an Environmental Management System to manage its impact on the environment, including climate change.

Guidance

Planning Practice Guidance: Climate Change (2019)

8.2.22 The Planning Practice Guidance provides additional guidance on aspects of the NPPF. The section 'Climate Change' is directly relevant to this assessment. Last revised in 2019, Planning Practice Guidance: Climate Change advises how to identify suitable mitigation and adaptation measures in the planning process to address the impacts of climate change. This guidance sets out the clear requirements for planning and development processes to adopt measures to meeting the legal targets of achieving net zero emissions by 2050 to mitigate effects of climate change and keep global temperatures increases to as near to, or below 1.5°C.

8.2.23 It is noted that the government guidance on the environmental issues to be considered in minerals planning has not been updated since 2014 and makes no reference to climate change. However, it does cross-refer to the Environmental Impact Assessment process and its newer underpinning legislation which does include a requirement to assess climate change.

The Institute of Environmental Management and Assessment (IEMA) Guidance

8.2.24 The guidance used in this climate change assessment to assess the GHG emissions associated with operations at the Proposed Development was produced by The Institute of Environmental Management (IEMA).

8.2.25 The IEMA published guidance on the framework for the effective consideration of climate baseline, future projections and climate change resilience and adaptation in the EIA process. The 'Environmental Impact Assessment Guide to: Climate Change resilience & Adaptation'

guidance has been used to inform this assessment.

8.2.26 Relating specifically to the assessment of GHGs within the EIA, IEMA published the 'Assessing Greenhouse Gas Emissions and Evaluating their Significance' (2022) guidance in February 2022, revised from 2017. The aim of this guidance is to assist professionals with addressing GHG emissions assessment, mitigation and reporting in statutory and non-statutory EIA. This guidance is considered best practice and informs this assessment.

8.3 Methodology

8.3.1 The Climate Change Assessment considers the aspects of the operations associated with the Scheme giving rise to greenhouse gas emissions, both directly on site and indirectly off site. The scope of the emissions considered can be used to calculate the intensity ratios for the mineral extraction. Intensity ratios calculated in kgCO2e/tonne of mineral product allow the impact of the development proposals to be compared against industry benchmarks.

8.3.2 Direct Greenhouse Gas Emissions (Scope 1 emissions) are those associated with onsite power generation for equipment, machinery, vehicles and processing. These sources are those which are owned or controlled by NRS. The values quantified are typically in litres of fuel (i.e. diesel, also known as gasoil).

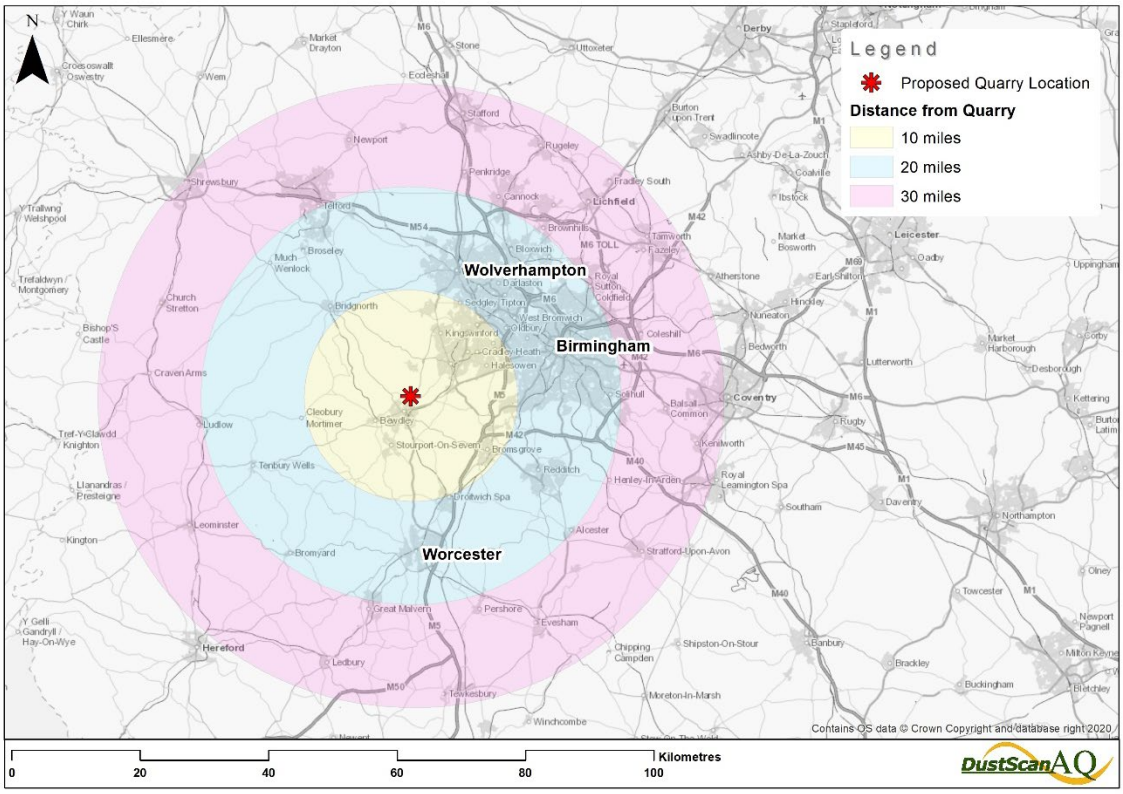
8.3.3 Indirect Greenhouse Gas Emissions (Scope 2 emissions) are those associated with electricity used and consumed onsite. In this instance it is defined as electricity purchased from the UK grid and bought into the boundary of the site to power various daily operations and activities.

8.3.4 Indirect Greenhouse Gas Emissions (Scope 3 emissions) have been included in this assessment only for transport of the products and imported fill. Scope 3 emissions are those related to the consequence of the activities of NRS and the quarry but are not directly owned or controlled by the NRS. This includes upstream and downstream emissions, such as the transportation of sand and gravel from site where vehicles are operated by third party companies and those associated with the production of fuels.

8.3.5 It should be recognised that there are limitations in the assessment of the Scope 3 emissions accounting for transport to the end user. National Planning Policies are predicated on the basis of continued economic growth, suggesting that if the mineral products needed for economic growth are not supplied by alternative technologies or from the proposed development, they will be supplied from elsewhere. The dominating factor in terms of these emissions is the distance between the proposed quarry and the ultimate market for the mineral products. As shown in Figure 8.1, the location of the proposed quarry adjacent to end user markets in Worcestershire and local conurbations, such as Birmingham, means that the proposed site is well-situated to reduce transport emissions, over alternative sources of minerals. The Minerals Production Association (MPA) published in its 2020/2021 Sustainable Development report information on delivery distances. The average road delivery distance for

aggregates varied between 23 and 28 miles between 2017 and 2020. The figure shows that the Worcestershire County and the local major urban areas of Birmingham and Wolverhampton are largely within 20 miles of the site, indicating that transport emissions are likely to be below the industry average. Making conservative and broad assumptions, the road transport element of the project may emit up to approximately 22,000 tonnes of CO2 equivalent over the lifespan of the project.

Figure 8.1: Location of proposed quarry showing distances to nearest population centres



8.3.6 The location of the substantial Lea Castle mixed use development under construction a few metres to the east of the proposed development may further reduce the need for transport.

8.3.7 Inert fill material will where possible be brought in on the NRS HGVs arriving to carry away mineral products. It is understood that NRS operates its own HGV fleet and aims for a high percentage of laden trips.

Assessment Uncertainties, Limitations and Assumptions

8.3.8 DustScanAQ accepts no responsibility for any inaccuracies in third-party data. The climate change assessment is based upon information supplied by the client to inform operational Scope 1 and Scope 2 emissions, as well as current and future projections of extracted material annually up to 2035. Predictions are based upon averages as exact amounts of material production will likely vary year to year.

8.4 Carbon Assessment and Greenhouse Gas Emissions (GHG)

8.4.1 The activity data for estimating the GHG emissions was provided to DustScanAQ by the Appellant based on the likely machinery to be operated on the Proposed Development with details of the tonnage of sand and gravel extracted, litres (l) of gas oil (diesel) used and kilowatt hours (kWh) of electricity used.

8.4.2 GHG emissions associated with the Proposed Development are reported in tonnes of CO2 equivalent (CO2e). This approach considers the varying global warming potentials of the different GHGs associated with global warming.

8.4.3 The GHG emissions have been calculated using the activity data (Scope 1 and Scope 2 emissions) provided by the client and emissions factors published by DEFRA for each activity. The likely emissions have been considered based on DustScanAQ's experience in assessing sand and gravel operations.

8.4.4 The proposed quarry will be extracted using conventional (diesel-powered) 360 excavators, articulated dump trucks and wheel loaders. The washing/screening plant will be electrically powered, intended to be supplied by an electricity grid. It may be powered by a diesel generator, but this is unlikely to be the economically preferred option.

8.4.5 The fundamental formula for emissions calculations is:

GHG Emissions = Activity Data x Emission Factor

8.4.6 Emissions factors for the baseline activity scenario vary are calculated from emission factors provided by DEFRA. The emissions factors for fuels are published retrospectively for each year as it is passed. Forecast grid electricity emissions factors are published up to 2100.

8.4.7 In terms of GHG emissions, the project is assessed for its relative intensity ratio (Re) which is defined by the difference between the absolute intensity ratio (Ab) generated by the proposed project, in this case the proposed Scheme, and the baseline intensity ratio (Be) from previous years of operation. However, since there has been no previous operation by NRS from which to take baseline data, the baseline for comparison is assumed to be the industry benchmark, using conventional means of extraction and processing.

8.4.8 The formula provided in the guidance for the calculations is:

Relative Intensity Ratio (Re) = Absolute Intensity Ratio (Ab) Δ Baseline Intensity Ratio (Be)

Table 8.1: Significant criteria of Intensity Ratios

Criteria	Impact	Significance
Intensity ratio is over 25% higher than baseline	Major adverse	Significant

Intensity ratio is up to 25% higher than baseline	Moderate adverse	Significant
Intensity ratio is up to 10% higher than baseline	Minor adverse	Significant
Intensity ratio is up to 5% lower or no higher than the baseline	Neutral	Not significant
Intensity ratio is up to 10% lower than baseline	Minor beneficial	Not significant
Intensity ratio is up to 25% lower than baseline	Moderate beneficial	Significant
Intensity ratio is more than 25% lower than baseline	Major beneficial	Significant

8.4.9 The Mineral Products Association (MPA) published in its 2020 Sustainable Development report information on GHG emissions associated with sand and gravel production in KgCO2e/tonne for the years 2016 – 2019. According to this report, emissions associated with sand and gravel production range from 2.3 – 3.4 KgCO2e/tonne. To assess future emissions associated with operations at the Proposed Development (in a 'no mitigation' scenario), the average value of 2.75 KgCO2e/tonne as provided by the MPA has been used as the benchmark against which activities can be compared.

8.4.10 The amount of sand and gravel exported from the Proposed Development is estimated to be on average 300,000 tonnes per year for ten years, totalling 3 million tonnes. This equates to scope 1 and 2 emissions of 8,250 tonnes of CO_2e over the lifetime of the project.

8.4.11 Mechanical extraction, internal transport, handling, washing and screening is estimated to result in an emission factor which is significantly below the industry benchmark, based on the relatively high quality of the mineral resource, compared to the industry average. Other factors which contribute to this assessment are that NRS use modern (i.e. relatively fuel efficient) Non-Road Mobile Machinery, the overburden is not excessive (reducing diesel consumption of excavation plant), the silt content estimated to be retained on site is 12 to 15% (reducing electricity consumption by the process plant), a conveyor will be used to move material internally on the site (avoiding diesel consumption in dump trucks), and the site is relatively compact (reducing the energy needed for internal transport). The processing plant is intended to be purchased new and specified for the quarry, which should result in energy efficiency savings over the industry average, since processing plant lasts a long time and the electro-mechanical design of the proposed plant is considered to offer energy efficiency savings over older designs. This is a qualitative judgement based on DS's experience of assessing the GHG emissions of sand and gravel operations.

8.4.12 With respect to reducing emissions from diesel-powered Non-Road Mobile Machinery, alternative means of propulsion by battery electric vehicle are beginning to enter the UK market, but unlikely to become mainstream and therefore a practical mitigation option during the proposed project lifetime.

8.4.13 If the operator were to enter into a Power Purchase Agreement for the electricity supplied to be 100% renewable, and this being the case, Scope 2 electricity emissions could be factored by zero, which would result in an emissions factor being reduced by 10% or so, reducing over the years into the future. The grid emissions factor for electricity is heading towards zero fairly rapidly, as the UK power grid converts to renewable wind and solar.

8.4.14 The GHG emissions for the Proposed Development Scope 1 and 2 categories have been assessed for the Relative Intensity Ratio (Re). This is estimated to be 10 to 25% reduction over the baseline, which is assessed to be a minor to moderate improvement against the industry benchmark.

8.4.15 The GHG emissions for the Proposed Development Scope 3 downstream transport emissions have been assessed qualitatively by comparing against industry benchmarks for delivery distance. The emissions are likely to be lower than industry benchmarks, due to the relatively advantageous location of the site in relation to the mineral product end users, and this is assessed as a minor to moderate improvement against the industry benchmark.

8.4.16 The combined Scope 1, 2 and 3 emissions of the proposed development are assessed as being a minor to moderate improvement over the industry benchmark. This is a significant positive impact.

8.4.17 The total Scope 1, 2 and 3 emissions associated with the lifetime project may be around 30,000 tonnes of CO_2e, based on broad assumptions and current emission factors. There is no guidance on comparing these emissions with other sources of emissions in the economy. However, given the chemical inertness (which is intrinsic to their utility) of the minerals compared to hydrocarbon mineral resources, the proposed development is a relatively extremely low carbon-intensive activity. By comparison, the mineral extraction of fossil fuels, such as coal at the proposed West Cumbria mine and petroleum in Surrey are extremely carbon-intensive, and would give rise to hundreds of millions of tonnes and tens of millions of tonnes of CO_2e respectively.

8.4.18 It is the opinion of DS that unlike the Finch case, the Scope 1, 2 and 3 emissions of the project are extrinsic to it: they do not necessarily arise as a consequence of the project. They are all avoidable by available (if currently not economically available) techniques.

8.5 Climate Baseline and Future Projections

8.5.1 Scientific evidence shows that the global climate is changing by way of a gradual warming of Earth's average surface temperatures. There are thought to be significant uncertainties with

regards to magnitude, frequency, spatial occurrence and whether these relate to average conditions or extreme conditions or events. These uncertainties inherently imply difficulty when assessing the impacts of climate change in relation to specific projects, such as the operations at the proposed development.

8.5.2 England and the UK are classified under the Köppen-Geiger climate classification system as 'Cfb' based on recent climate data from 1980 – 2016. Future projection of the Köppen-Geiger system from 2071 – 2100, using scenario RCP 8.5, predicts that England and the UK will remain within the 'Cfb' designation. Cfb, also known as temperate oceanic climate, is classified by mid-latitude climates with warm summers and mild winters and without a dry season.

8.5.3 For the climate baseline conditions at the proposed development historical data provided by the Met Office was utilised. The data from the period 1991 – 2020 has been taken from the closest meteorological station with available data in Shawbury, Shropshire (Climate Station: Shawbury) which lies approximately 51 km to the northwest of the Scheme, as seen in Table 8.2 below.

Figure 8.2: Shawbury Met Office Weather Station in Relation to the Proposed Quarry

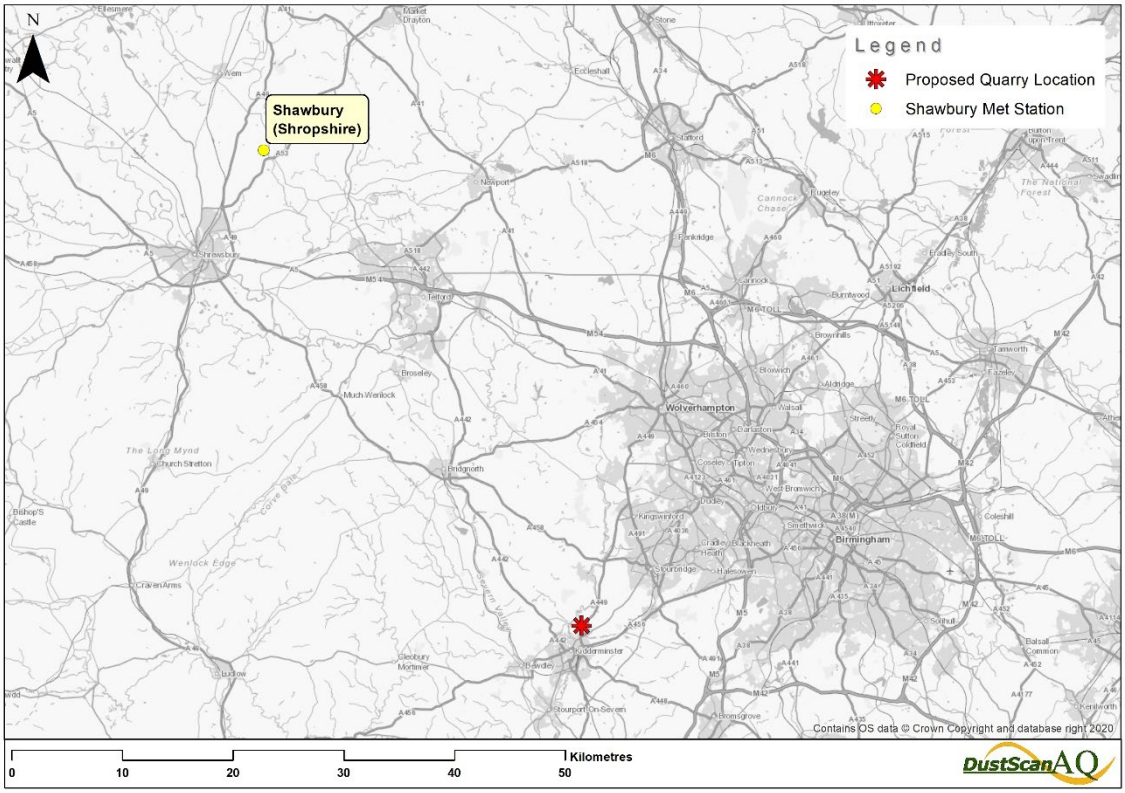


Figure 8.3: Maximum and Minimum Monthly Averages, Shawbury (Shropshire)

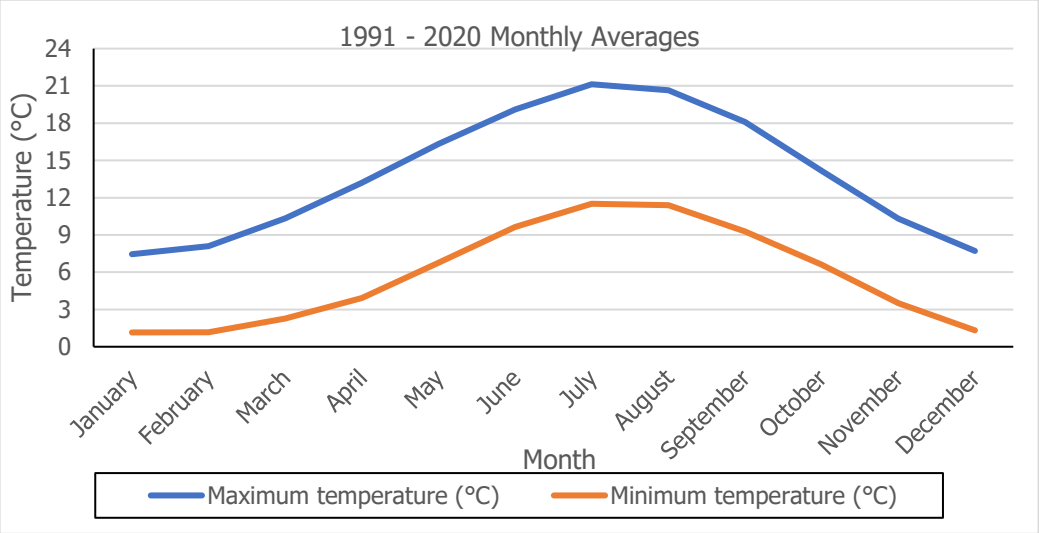


Figure 8.4: Monthly Average Rainfall, Shawbury (Shropshire)

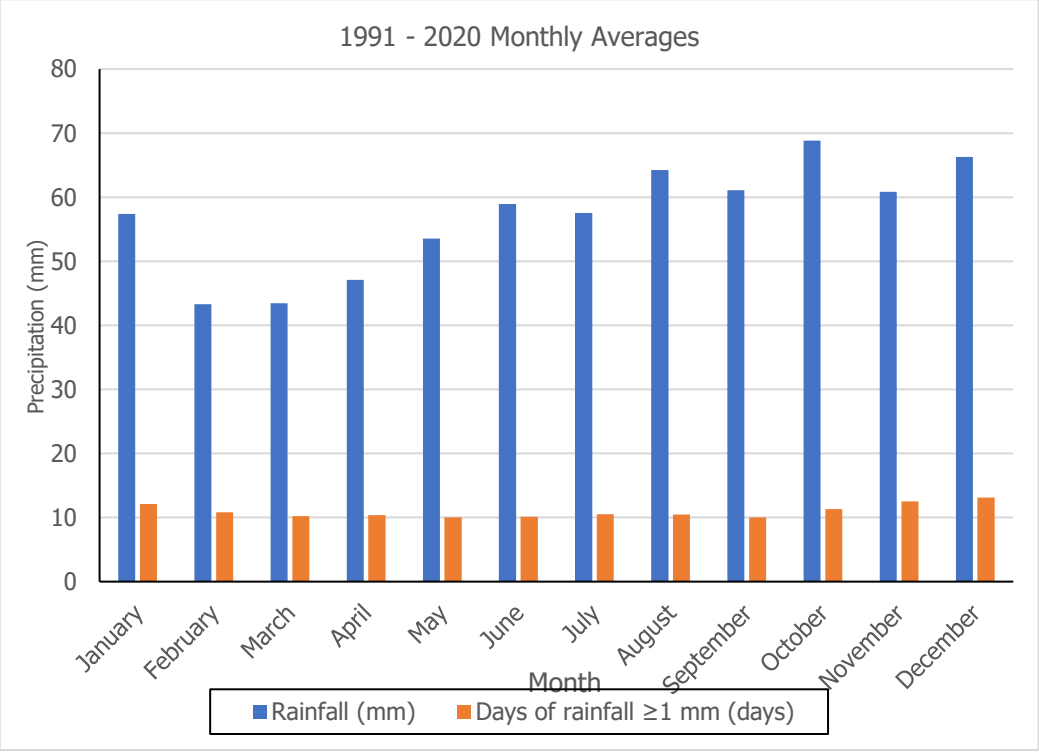


Table 8.2: Temperature and Precipitation Averages 1991 – 2020, Shawbury (Shropshire)

Month	Max Temp (°C)	Min Temp (°C)	Rainfall (mm)	Days ≥1 mm Rainfall
January	7.45	1.15	57.4	12.13
February	8.1	1.17	43.31	10.83
March	10.34	2.27	43.44	10.23
April	13.21	3.92	47.08	10.37

May	16.33	6.75	53.56	10
June	19.11	9.63	58.95	10.1
July	21.13	11.51	57.55	10.53
August	20.66	11.39	64.23	10.47
September	18.1	9.27	61.07	10
October	14.16	6.61	68.83	11.33
November	10.32	3.5	60.84	12.53
December	7.71	1.33	66.27	13.1
Annual	13.91	5.73	682.53	131.62

8.5.4 The baseline weather data shows typical trends in the average temperatures, with highest temperatures recorded in the summer months of June, July and August. The lowest temperatures are recorded in the winter months of December, January and February. The precipitation data shows slightly atypical results with the driest month being February, followed by the spring months of March and April. The top three wettest recorded months in descending order are October, December and August.

8.5.5 The climatic baseline (1991 – 2020) data for Shawbury via the Met Office shows that annual average wind speeds at 10 m are 8.13 knots (kn). The general trend also shows that slightly higher winds are recorded in the winter months with lower speed winds recorded in the summer months.

8.5.6 The latest future climate projections for the UK (UKCP18) are based on global climate models. Predictions are based upon different emissions scenarios determined by the Representative Concentration Pathways (RCPs). The different RCPs represent different concentrations of GHGs resulting in different total radiative forcing (the difference between incoming and outgoing radiation in the upper atmosphere). Radiative forcing targets have been set up to the year 2100 and consider 4 main scenarios; 2.6, 4.5, 6.0 and 8.5 watts per square metre (w/m2) which together cover a wide range of probable future emissions scenarios. Each scenario considers many factors regarding the future of humanity including population growth, technological innovation, economics as well as general attitudes towards social and environmental sustainability. RCP 2.6 is considered the best-case scenario and RCP 8.5 is the worst-case scenario. In accordance with the IEMA (2020) guidance, this assessment has been carried out using the high emissions RCP 8.5 scenario.

8.5.7 In general, the results of climate change in the UK will lead to hotter summers and warmer winters, precipitation is expected to decrease in the summer months but increase in the winter months. In conjunction with these effects, extreme weather events are also likely to increase with increases in near surface wind speeds.

Figure 8.5: Summer Months Mean Temperature Anomaly

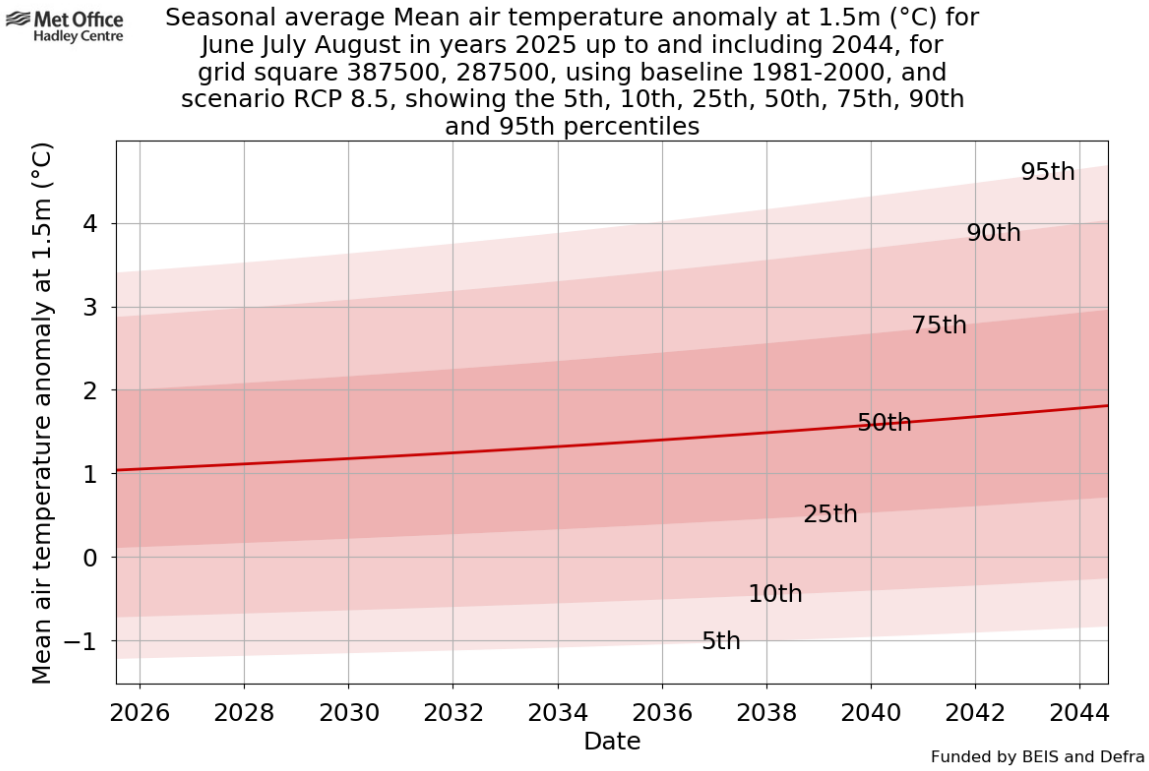


Figure 8.6: Winter Months Mean Temperature Anomaly

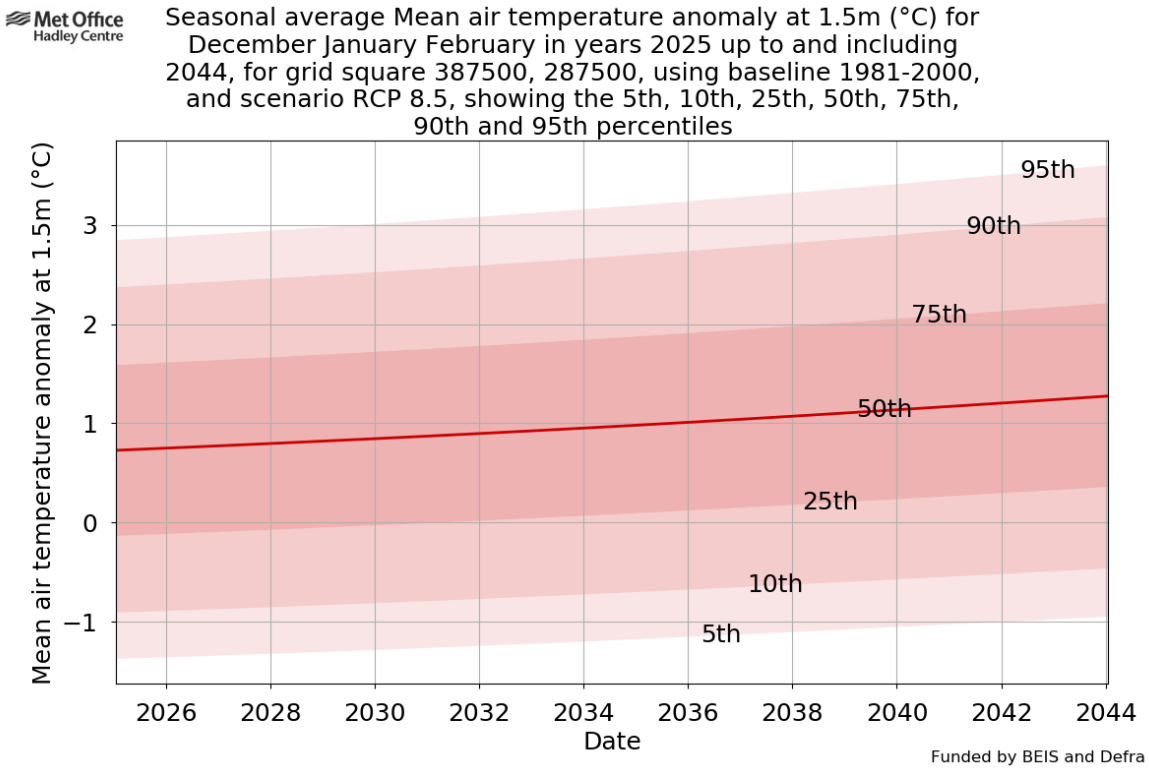


Figure 8.7: Summer Months Maximum Air Temperature

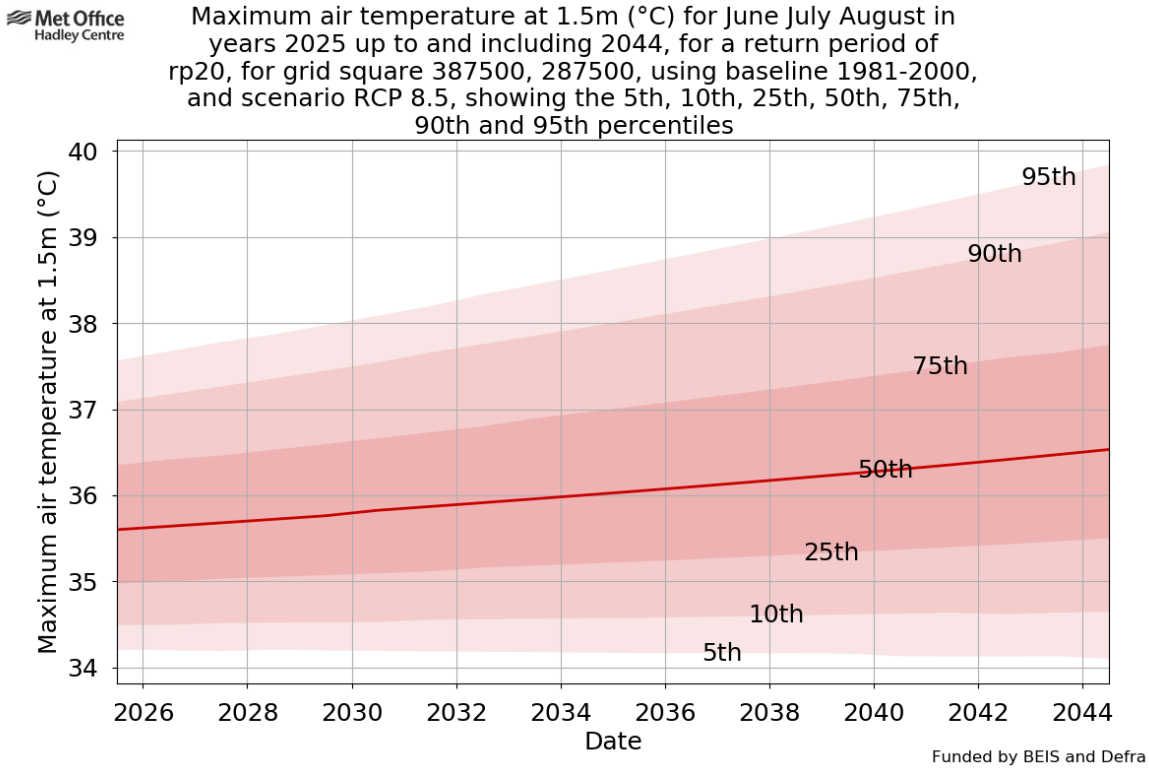


Figure 8.8: Winter Months Maximum Air Temperature

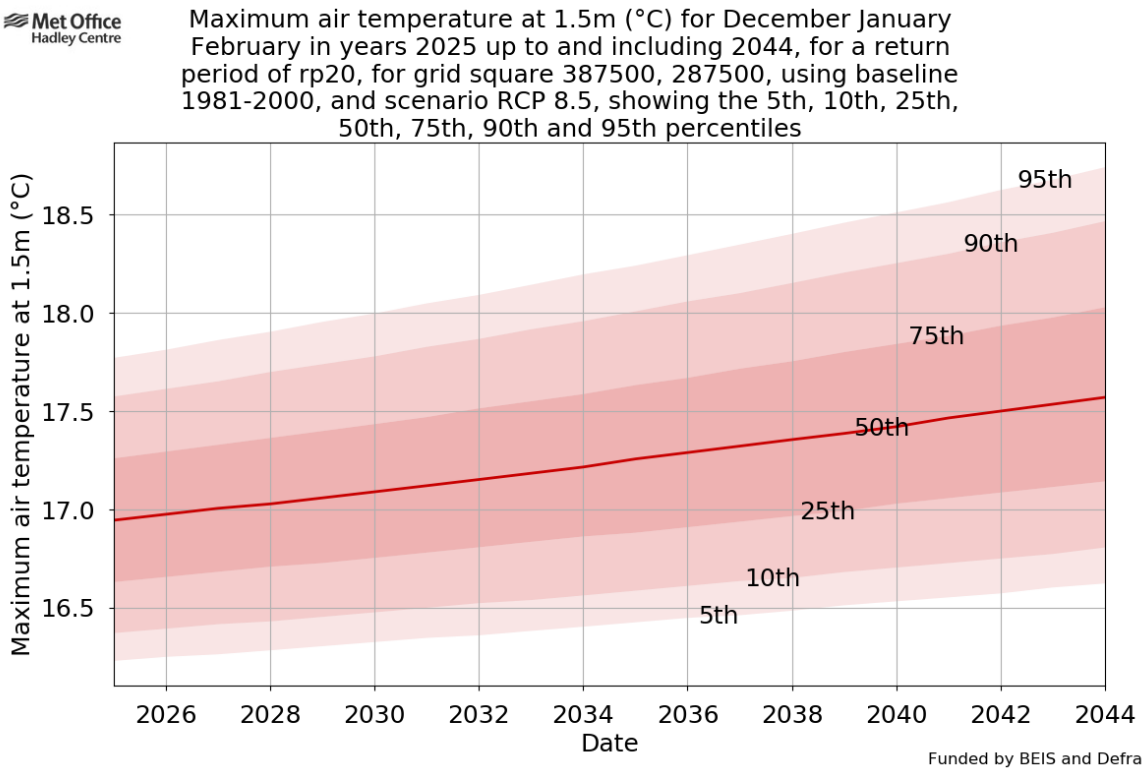


Figure 8.9: Summer Months Average Precipitation Anomaly

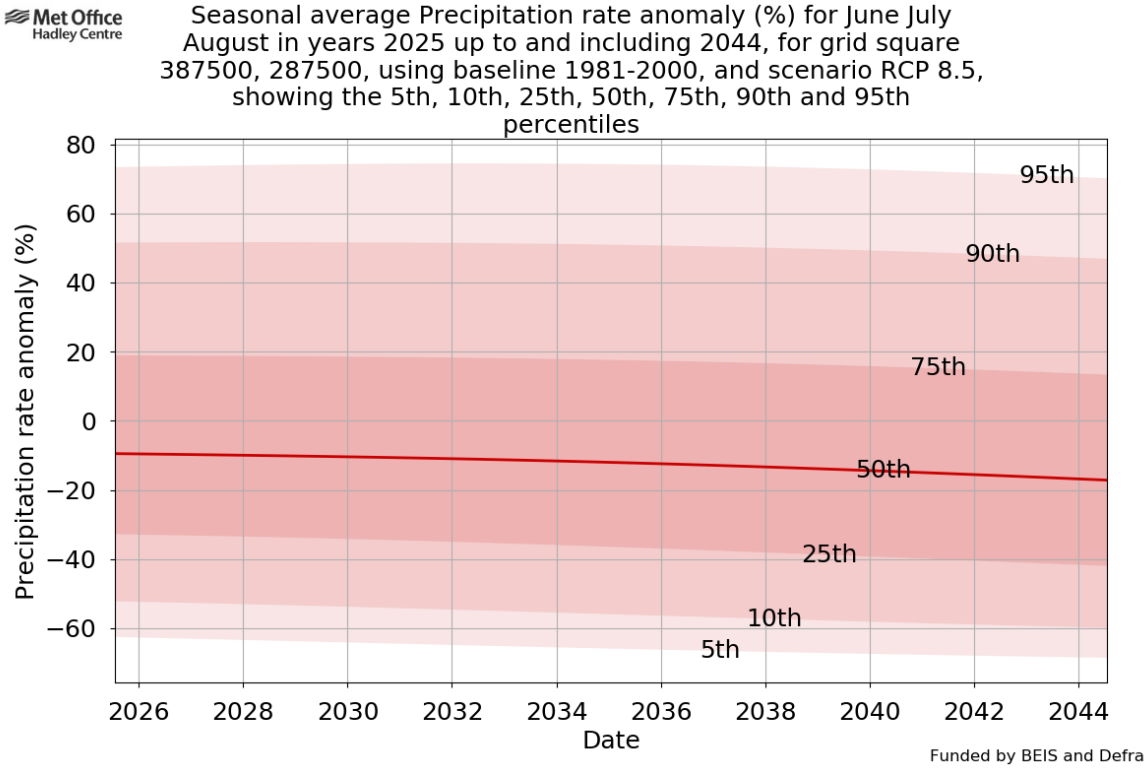
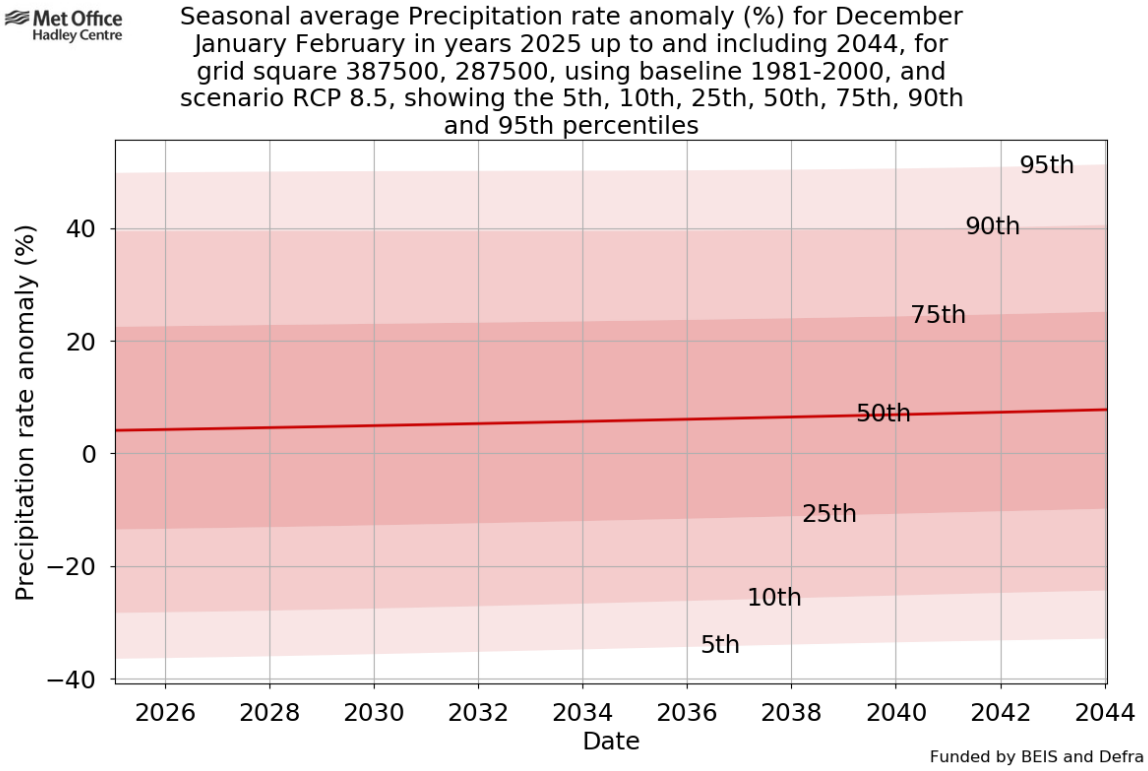


Figure 8.10: Winter Months Average Precipitation Anomaly



8.5.8 Based upon Figure 8.5 – Figure 8.8 using IEMAs recommended scenario (RCP 8.5), it shows that temperatures will increase in both summer and winter months, however the predicted increases in temperature are more dramatic in the summer months. Figures 8.9 – 8.10 also show that precipitation will increase in winter months but decrease in summer months.

8.5.9 These future climate projections are based upon a conservative scenario (RCP 8.5) therefore it is possible that less exaggerated changes will occur.

8.6 Site Resilience to Climate Change

8.6.1 Potential receptors within elements of the project relevant to location, nature and scale of the development must also be identified as per the IEMA guidance.

8.6.2 This climate change resilience section has considered and assessed for the following vulnerable receptors:

- Buildings and infrastructure receptors (including equipment and building operations);
- Human health receptors (e.g. construction workers, occupants and site users); and
- Environmental receptors (e.g. habitats and species).

8.6.3 Climate change has the potential to have profound effects on receptors. Therefore, the following has been considered for each receptor as per the IEMA guidance:

- The sensitivity of the receptor, this considers the value or importance of the receptor and the susceptibility and vulnerability of the receptor to the effect of climate change;
- The magnitude of the impact, this considers the probability or likelihood of a climate related event occurring and the consequence of the event; and
- The significance of the effect, which takes into account both the identified sensitivity of the receptor and the magnitude of the impact.

8.6.4 The IEMA guidance (2020) defines sensitivity in the scope of this assessment:

"*The sensitivity of the receptor/receiving environment is the degree of response of a receiver to a change and a function of its capacity to accommodate and recover from a change if it is affected*."

8.6.5 The susceptibility and vulnerability of the receptor is classified using the criteria in Table 8.3 and Table 8.4.

Table 8.3: IEMA Susceptibility Criteria

Susceptibility Criteria (IEMA, 2020)	
Low	Receptor has the ability to withstand/not be altered much by the projected changes to the existing/prevailing climatic factors (e.g. retain much of its original function and form).

Moderate	Receptor has some limited ability to withstand/not be altered by the projected changes to the existing/prevailing climatic conditions (e.g. retain elements of its original function and form).
High	Receptor has no ability to withstand/not be substantially altered by the projected changes to the existing/prevailing climatic factors (e.g. lose much of its original function and form).

Table 8.4: IEMA Vulnerability Criteria

Vulnerability Criteria (IEMA, 2020)	
Low	Climatic factors have little influence on the receptors (consider whether it is justifiable to assess such receptors further within the context of EIA – i.e. it is likely that such issues should have been excluded through the EIA scoping process.
Moderate	Receptor is dependent on some climatic factors but able to tolerate a range of conditions (e.g. species which has a wide geographic range across the entire UK but is not found in southern Spain).
High	Receptor is directly dependent on existing/prevailing climatic factors and reliant on these specific existing climate conditions continuing in the future (e.g. river flows and groundwater level) or only able to tolerate a very limited variation in climate conditions.

Table 8.5: Receptor Sensitivity Results

Receptor	**Sensitivity**
Building and infrastructure	Medium
Human health	Medium
Environmental	High

8.6.6 In line with the IEMA guidance, in order to reach a conclusion on the magnitude of the effect of climate change on the development, a combination of likelihood (probability) and consequence must be considered.

- Probability, which would take into account the chance of the effect occurring over the relevant time period (e.g. lifespan) of the development if the risk is not mitigated; and
- Consequence, which would reflect the geographical extent of the effect or the number of receptors affected (e.g. scale), the complexity of the effect, degree of harm to those affected and the duration, frequency and reversibility of effect.

8.6.7 Definitions of likelihood and magnitude will vary from scheme to scheme, and should be tailored to a specific project. The IEMA guidance does not prescribe a singular approach to the assessment of likelihood and magnitude of climatic events.

8.6.8 Assessment of the magnitude of impacts should take into account factors including:

- The acceptability of any disruption in use if the project fails;
- Its capital value if it had to be replaced;
- Its impact on neighbours;

- The vulnerability of the project elements or receptor; and
- If there are dependencies within any interconnected network of nationally important assets on the new development.

Table 8.6: IEMA Likelihood Criteria Example

Likelihood Criteria (IEMA, 2020)	
Very high	The event occurs multiple times during the lifetime of the project (60 years), e.g. approximately annually, typically 60 events.
High	The event occurs several times during the lifetime of the project (60 years), e.g. approximately once every 5 years, typically 12 events.
Medium	The event occurs limited times during the lifetime of the project (60 years), e.g. approximately once every 15 years, typically 4 events.
Low	The event occurs during the lifetime of the project (60 years), e.g. once in 60 years.
Very Low	The event may occur once during the lifetime of the project (60 years).

60 years used as example lifetime in IEMA guidance.

Table 8.7: IEMA Consequence of Impact Criteria Example

Consequence of Impact Criteria (IEMA, 2020)	
Very large adverse	National-level (or greater) disruption to strategic route(s) lasting more than 1 week.
Large adverse	National-level disruption to strategic route(s) lasting more than 1 day but less than 1 week OR Regional level disruption to strategic route(s) lasting more than 1 week.
Moderate adverse	Regional level disruption to strategic route(s) lasting more than 1 day but less than 1 week.
Minor adverse	Regional level disruption to strategic route(s) lasting less than 1 day.
Negligible	Disruption to an isolated section of a strategic route lasting less than 1 day.

8.6.9 As detailed previously, there are specific receptors which have been considered for this assessment. The specific climate change impacts that are likely to affect these receptors are temperature, precipitation and extreme weather. In order to determine the magnitude of climate change impact on these receptors an assessment on the likelihood (probability) and consequence of impact has been undertaken using the criteria from Table 8.6 and Table 8.7.

Table 8.8: Significance Matrix for Assessing Climate Resilience

Climate Resilience		**Measure of Likelihood**				
		Very low	Low	Medium	High	Very high
Measure of Consequence	Negligible	Negligible (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)	Minor (Not Significant)	Minor (Not Significant)
	Minor adverse	Negligible (Not Significant)	Minor (Not Significant)	Minor (Not Significant)	Moderate (Significant)	Moderate (Significant)

	Moderate adverse	Minor (Not Significant)	Minor (Not Significant)	Moderate (Significant)	Moderate (Significant)	Moderate (Significant)
	Large adverse	Minor (Not Significant)	Moderate (Significant)	Moderate (Significant)	Substantial (Significant)	Substantial (Significant)
	Very large adverse	Minor-Moderate (Not Significant)	Moderate (Significant)	Moderate-Substantial (Significant)	Substantial (Significant)	Substantial (Significant)

Table 8.9: Assessment of the Magnitude of Climate Change Impacts on the Development and Receptors

Climate Change Issue	Measure of Likelihood	Measure of Consequence	Magnitude of Effects
Temperature	Medium/High	Minor adverse	Minor
Precipitation	Low/Medium	Minor adverse	Minor
Extreme Weather	Low/Medium	Minor adverse	Minor

8.6.10 The future projections of temperature for this assessment are seasonal averages, therefore it is likely that isolated daily temperatures may have far greater increases causing greater risks. The most notable risk associated with maximum temperature increases are the risk of heat exhaustion or heat stroke to human health receptors. In particular, site workers which will require personal protective equipment (PPE) may have increased risk to conditions relating to increased temperatures.

8.6.11 Increased winter temperatures will reduce the demand on heating but contrasted with an increase in summer temperatures, a greater need for cooling in buildings and within plant vehicles may be necessary. Increased temperatures may also affect site machinery and equipment, particularly those which generate heat themselves or components which may be at risk of degradation due to heat exposure (e.g. rubber or plastic components, fuel storage, infrastructure).

8.6.12 There are many risks that could arise relating to changes in precipitation. The increase in precipitation in winter months is likely to cause widespread disruption across many industries and businesses, including quarrying. As addressed previously, the majority of the proposed quarry site is in a flood zone 1. Flood zone 1 is the lowest risk zone with less than 0.1% annual probability of flooding. The site is considered to be at a very low annual chance of flooding from both surface water and rivers and sea. An increase in flooding could occur which could inhibit vehicle movement around the site depending on its severity, potentially reducing extraction for a limited time period. Local drainage systems will also be under added stress which can also exacerbate flooding issues. A water build-up within the quarry could also lead to potentially unstable ground conditions and landslides.

8.6.13 The River Stour is located to the west of the proposed quarry. River flow could be more than

50% more than now at its peak, and 80% less than now at its lowest. Increased flow to the surrounding rivers poses further risk to flooding damage, whilst river drought restrictions may decrease available water for site processing use and dust suppression.

8.6.14 During the summer months an increased risk of drought will be the result of temperature increases, with droughts becoming more frequent. Operations that require water supply, such as washing may be impeded temporarily. Droughts will also lead to increased dust generation and propagation thus potentially negatively affecting air quality; this may affect receptors at the nearby residential areas of Broadwaters, Cookley, Wolverley and Fairfield. The drying of soil and sand on site from drought could lead to the ground instability and slope failures.

8.6.15 Extreme weather events, notably storms and associated winds could lead to an increased risk of damage to infrastructure and facilities on site, as well as potential tree fall. An increase in wind speed will also increase the risk of dust propagation beyond site boundaries.

8.6.16 Climate change effects may adversely impact the plans for site restoration and replanting. Drought conditions may hinder the re-establishment of natural plant and tree cover.

Table 8.10: Significance Assessment for Climate Resilience

Climate Change Issue	Magnitude of Effects	Level of Significance
Temperature	Minor-Moderate	Not Significant
Precipitation	Minor-Moderate	Not Significant
Extreme Weather	Minor	Not Significant

8.6.17 The results from the significance assessment in Table 8.10 show the effects of climate change on site and receptors is considered to be Not Significant. Given the time frame of operations for the Proposed Development, increased risks associated with climate change are likely, however dramatic changes in temperature and precipitation on site are unlikely to be experienced. Therefore, the effects of climate change on site are considered to be negligible to slight, and as such, there will be no significant adverse effects due to climate change.

8.7 Conclusion

8.7.1 This climate change assessment is for the proposed development of a sand and gravel quarry at Lea Castle Farm, Kidderminster, Worcestershire.

8.7.2 The climate change assessment has been developed in line with the relevant IEMA guidance (2020 & 2022).

8.7.3 The results of the carbon assessment, defining the baseline and estimating future GHG emissions, found that the impact of future operations on GHG emissions at the site has a minor to moderate beneficial significant impact, compared to the mineral industry benchmark for sand and gravel extraction. Mitigation measures may also be considered in order to reduce the future emissions and reduce the overall carbon footprint of the site. Emissions reductions over baseline of a reasonable percentage are possible for the operation if it gains consent.

This is in line with the UK's trajectory towards net zero by 2050.

8.7.4 The project overall may give rise to an emission of around 30,000 tonnes of CO2 equivalent, extrinsic to the mineral use. This a trivial quantity in comparison to two well-known mineral development applications: the proposed oil extraction in Surrey and the West Cumbria coal mine. In June 2024 the UK Supreme Court ruled that the grant of planning permission for oil production in R (Finch) v Surrey County Council was unlawful for failing to assess scope 3 GHG emissions that would inevitably rise from the combustion of fuel. The environmental effects of the project were described as "negligible" in the environmental statement based on the estimated direct GHG emissions for the lifetime of the project (140,958 tonnes of CO*2*) and the proportion this figure would represent in the total UK carbon budget. The Supreme Court highlighted in its judgement (para 81) that the estimate calculations of combustion emissions could readily be done with a suitable conversion factor. It was presented in evidence that total combustion emissions, based on the estimated output from the proposed project of 3.3 million tonnes of oil, gives a total of 10.6 million tonnes of CO*2* emissions over the project lifetime. The Supreme Court noted that had the combustion emissions been included in the assessment, the effects of the project "could not have been dismissed as 'negligible' in that way". West Cumbria Mining Ltd submitted an application (ref. 4/17/9007) to the relevant mineral planning authority, the former Cumbria County Council, for a new underground metallurgical coal mine in 2017. The Secretary of State (SoS) 'called-in' the application resulting in a Public Inquiry (ref. APP/H0900/V/21/3271069). Permission was granted by the SoS in December 2022. It would produce around 60 million tonnes of coal and CO_2e emissions of 180 to 220 million tonnes (estimates vary).

8.7.5 The climate baseline has been defined and future climate projections made following published climate models to predict the effects of climate change on site. The predicted climate change effects on site were defined as an increase in summer and winter temperatures, an increase in winter precipitation, a decrease in summer precipitation and an increase in extreme weather events. The effects of climate change on site are considered to be negligible to slight, and as such, there will be no significant adverse effects due to climate change. The site resilience (i.e. considering human, infrastructure and environmental receptors) to the effects of climate change were assessed, and the effects of climate change will be Not Significant.

8.7.6 The proposed operation is relatively resilient to the effects of climate change. It is not possible to mitigate all risks associated with climate change but through the results presented in this assessment, these risks identified are considered acceptable. The overall impact of climate change on the Proposed Scheme is Not Significant.

8.7.7 The proposed scheme meets national and local planning policy on climate change.

9 Cumulative Impact Assessment

9.1 Introduction

9.1.1 A Cumulative Impact Assessment was carried out as part of the original application and formed part of the Environmental Statement at Chapter 22. The Environmental Statement concluded that there are no cumulative impacts that would arise from the scheme in combination either within itself or with other existing / proposed developments that would render the proposed quarry extension unacceptable.

9.1.2 A further updated Cumulative Impact Assessment was submitted in February 2023 in response to the Environmental Services Department of the Planning Inspectorate requesting further information under Regulation 25 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017. This concluded that the cumulative impact of the scheme does not weigh against the scheme to a degree that the Planning Inspector should form a cumulative reason to object to the proposal. In reaching this view particular regard has been given to the temporary nature of the development and the short, medium and long term benefits that would arise.

9.2 Assessment Methodology

9.2.1 The approach to assessing cumulative impact has followed the advice of Mr Justice Burton (in the Long Moor case - The Queen (on the application of Leicestershire County Council) v. the Secretary of State for Communities and Local Government and UK Coal Mining Ltd (2007) EWHC Admin 1427) by considering the three categories of potential cumulative effects: successive effects; simultaneous effects from concurrent developments; and combined effects from the same development and then sets out reasoning behind the judgements reached.

9.2.2 The assessment of cumulative impact has had regard to positive and negative effects to ensure that an overall balanced judgement is reached. The potential positive impacts are particularly relevant when considering the combined effects from the same development. Care has been taken to ensure that any positive effects have not been double counted in the assessment work.

9.2.3 This section of the updated Cumulative Impact Assessment submitted in February 2023 remains valid.

9.3 Successive and Simultaneous Effects

9.3.1 As part of the ‘proper assessment’ of the cumulative impacts of the proposal it is necessary to consider the potential successive and simultaneous effects of mineral development on the

general locality. In geographical terms, the Appellant has taken the 'general locality' as a radius of 1km from the centre of the proposed site representing a reasonable distance.

9.3.2 The assessment of successive and simultaneous effects considers the potential cumulative impact of past and potential future mineral workings on the local community. It also has regard to similar types of operations such as waste management developments and construction sites.

9.3.3 In terms of the simultaneous effects of concurrent developments, an assessment of existing mineral development (and other similar operations) in the study area has been carried out to consider the potential cumulative impact on the locality. The one obvious existing development is the current Lea Castle Village and wider allocation which is considered below in relation to both successive and simultaneous effects.

9.4 Successive Effects

9.4.1 Historically, the site formed a part of the c.220ha grounds of Lea Castle, which was built around 1762 and demolished in 1945. There has also been a number of applications submitted at the site over the years, in particular, planning applications for the construction of golf courses (one 18-hole and one 9-hole golf courses), with the first submitted to Wyre Forest District Council in March 1999 (ref. WF/0260/99). This application (WFDC) was refused at Planning Committee on 14th March 2000 and a subsequent appeal was withdrawn. However, an application (ref. WF/0211/01) was permitted by Committee on 17th July 2001 for 'construction of two new golf courses (18 hole and 9 hole), new clubhouse and ancillary facilities, new access to Castle Road, Cookley, new driveways and parking facilities, golf practice area and diversion of public footpaths'. This planning permission was never implemented.

9.4.2 Consideration of the cumulative impact of the proposed development alongside the existing land uses in the direct vicinity of the Site has led to the conclusion that there are no land uses in the locality of the Site that have the potential to result in significant adverse effects on nearby receptors, when combined with the anticipated impacts of this proposal.

9.4.3 The proposed development will therefore not be adding to an existing problem. The proposed development is driven by the geological prospects together with the identified need in the adopted Minerals Local Plan Policy for the provision of a viable and high quality mineral.

9.4.4 As demonstrated within the ES, the proposed development is environmentally acceptable, and the restoration proposals provide environmental benefits.

9.4.5 In light of the above, the successive impacts of the proposal are considered to be negligible.

9.4.6 This section of the updated Cumulative Impact Assessment submitted in February 2023 remains valid.

9.5 Simultaneous Effects

9.5.1 In terms of mineral development, there are no mineral/mining related development in close proximity to the proposals at Lea Castle Farm which would be considered to have a simultaneous cumulative impact upon local receptors.

9.5.2 In terms of other types of development that could have a concurrent effect, to the east of the site on the opposite side of Wolverhampton Road, there is an allocation for around 1,400 dwellings (600 of these already have planning permission under 17/0205/OUTL) with a mix of employment and retail provision and known as Lea Castle Village. Development has commenced on the development of planning permission 17/0205/OUTL. In terms of the remaining 800 dwellings of the above allocation, an application was submitted in May 2022 (Ref: 22/0404/OUT) and is still under determination.

9.5.3 Although planning application ref: 22/0404/OUT has not received the grant of planning permission, the development of the site has the potential to create new sensitive receptors and could also give rise itself to potential environmental impacts on existing receptors during the construction phase. Such impacts could potentially occur in conjunction with the development/operation of the proposed Lea Castle Farm development.

9.5.4 The main environmental effects that could arise from the housing site being constructed at the same time as the proposed development of Lea Castle Farm are noise, dust and visual impacts. The other impact that could contribute cumulatively to impact in the locality is construction traffic, which may combine with HGV traffic generated by the Lea Castle Farm site.

9.5.5 The potential housing development would be physically separated from the Lea Castle Farm site by both soil and overburden mounds along with Wolverhampton Road. In terms of impacts it is considered that the combined effect of both developments taking place concurrently would only marginally increase the degree of overall impact and therefore would not give rise to objectionable concurrent effects. The potential housing development would be over 200m from the proposed extraction area. The impacts upon this site have been assessed as part of this Appeal. There are no unacceptable impacts assessed to arise from the proposals upon the existing or potential housing development.

9.5.6 It is noteworthy, that on review of the supporting documents submitted for planning application ref: 22/0404/OUT, there is no form of consideration for cumulative impacts from the Lea Castle Farm development. The Landscape and Visual Appraisal prepared by Wood does make reference to the Appeal development at paragraph 3.5.4 and states the following:

The Lea Castle Farm Sand and Gravel Quarry application (application reference 19/000053/CM) is currently under consideration with WCC. This site covers a 46 ha area comprising 26 ha of mineral extraction located approximately 25 m west of the Wider Site. If

granted, this development would result in a number of new landscape and visual components being introduced across the site. The conclusions of the Landscape and Visual Impact Assessment (LVIA) for the Quarry application was that "the landscape and visual effects resulting from the Proposed Development would be temporary, progressive and localised and Not Significant. Progressive restoration to the post restoration scheme provides opportunities for both enhanced landscape, visual and amenity and wellbeing which will result in Beneficial effects."

9.5.7 The above does not challenge the findings of the LVIA and it can be assumed from the lack of challenge and consideration of the Appeal development, that the technical experts for application ref: 22/0404/OUT consider that no unacceptable impacts will arise from the proposals upon the potential housing development.

9.5.8 This section of the updated Cumulative Impact Assessment submitted in February 2023 remains valid.

9.6 Combining the Potential Impacts

Introduction – Approach to Potential Levels of Objectionability

9.6.1 All mineral developments produce effects that occur together and their combined impact can potentially give rise to significant impacts. In terms of the methodology for assessing cumulative environmental effects from such operations this section follows the approach taken by the Planning Inspector in the consideration of UK Coal's surface mining operation at Huntington Lane, Telford. The Inspector's approach in regard to this was subsequently endorsed by the Secretary of State on 6th October 2009.

9.6.2 In paragraph 552 of the Inspector's Report into the Telford proposal he noted "For individually acceptable impacts to be elevated together to unacceptable impacts, they must have a synergistic effect". In order to assess the combined effects properly it is necessary to consider whether some or all of the individually acceptable effects are so close to being unacceptable, that when combined together, the totality is unacceptable. In this regard the approach set out by Mr Justice Burton is considered appropriate to follow, the methodology of which is outlined above.

9.6.3 The potential benefits of the proposal are also identified so that they can be combined allowing the cumulative assessment to balance both positive and negative effects.

Consideration of the Potential Impacts

9.6.4 Before attempting to combine the potential impacts and adopting the approaches outlined it is first necessary to establish the potential level of objectionability for each area of potential impact. In doing so, careful regard has been had to the subject specific technical/professional reports of the various specialists contained in the Appendices of the Environmental Statement

along with further technical work submitted in response to Regulation 25 requests during the determination of the Appeal application. Furthermore, as part of this Appeal, further technical assessments have been carried out in terms of LVIA, noise and air quality and dust. Set out below is a summary of the findings on each aspect and a view taken on the level of objectionability.

Landscape and Visual Impact

9.6.5 The potential for cumulative landscape and visual effects between the Proposed Development in conjunction with the permitted Lea Castle Development (17/0205/OUT) and adjacent allocated Site were considered in the original LVIA. The permitted Lea Castle development is now under construction and the allocated Site covered by planning application 22/040/OUT is still to be determined at the time of writing.

9.6.6 The location of other developments (recently constructed, permitted or in the planning system) are illustrated on **Figure 4.71** in relation to the application and extraction boundaries of the Proposed Development.

9.6.7 The original ES and LVIA had accounted for 18/0163/FULL – 91 dwellings at Stourbridge Road, although additional smaller residential developments have since been approved and are identified on **Figure 4.71** and listed below.

- 22/0235/PIP – 4 dwellings at Wolvereley Lodge. Application approved;
- 20/0217/FUL - Demolition of existing building and erection of 4 x two-bed bungalows. This development has now been completed; and
- 21/1200/OUT - erection of three dwellings, garages and associated operational development. This application and the subsequent appeal was refused i.e., this scheme does not form part of the cumulative assessment but is included for completeness.

9.6.8 The following cumulative assessment applies to both the original and revised scheme unless otherwise explicitly stated.

Lea Castle Mixed Use Development (17/0205/OUT and 22/040/OUT)

9.6.9 Potentially significant cumulative effects upon landscape elements between the Lea Castle Mixed Use development and the Proposed Development are Neutral and potentially beneficial because both schemes seek retention of existing tree and hedgerow planting to the perimeter of the Sites and would contribute new planting as part of their respective mitigation schemes.

9.6.10 There would be a permanent loss of agricultural land as part of the Lea Castle mixed use development, however the Site would be progressively restored following mineral extraction

in each phase and fully restored after 11 years and the restored soil profiles will enable it to achieve BMV status as agricultural land in the future if required.

9.6.11 In terms of landscape character, both the Lea Castle mixed-use development and the Proposed Development lie within the Sandstone Estateland Landscape Type (LVIA Figure 4). The area of land where mineral is being extracted at any one time within the operational phase would be less than 10 hectares. The progressive restoration would result in long term improvements to landscape character, in terms of historical continuity i.e., reinstatement of avenue trees and the Broom Covert woodland, and the introduction of groups of parkland trees and acidic species rich grassland. Public access would be improved by the addition of new public rights of way.

9.6.12 Cumulative landscape character and visual effects can be perceived in combination (where both developments are visible from the same location and in the same field of view), successively (where both developments are perceived from the same location by turning one's head), or sequentially, (where both developments are not visible at the same location but are perceived separately, in sequence, when travelling on a route). It is important when carrying out a cumulative landscape and visual assessment that effects in three-dimensions are fully understood. Just because two developments may be located relatively close to each other (as seen in a 2-dimensional plan view), does not necessarily equate to a cumulative effect that would be perceived in the field.

9.6.13 At Viewpoint 1, the residential development under construction (17/0205/OUT) can be glimpsed behind woodland in the far right of the view. New built development as part of 22/040/OUT would extend across the foreground and middle-ground of the view preventing any views from the public footpath towards the Proposed Development. Any views within the new mixed-use development are likely to be highly restricted by adjacent built form. Any theoretical glimpses of the extraction of Phases 4/5 would be largely restricted by the perimeter screen bunds set below the horizon with potential glimpses of the initial soil strip on Phase 4, similar to an agricultural operation, with the extraction working eastwards and very quickly below the height of the intervening landform. There would be a Neutral cumulative visual effect.

9.6.14 At Viewpoint 2, new built development as part of 22/040/OUT would be partially visible to the left of the road corridor (beyond the extent of presented photography). By contrast the Proposed Development would be predominantly screened from view with the upper parts of the screen bunds potentially visible above and behind retained hedgerow planting. At nearby Viewpoint 9, from a more elevated location that is closer to the Proposed Development but not publicly accessible, the limited and filtered views of part of the grass seeded screen bunds to the east of Phase 4 are illustrated in the photomontages. This temporary mounding would only be in place for approximately 5 years and there would be a Neutral cumulative visual effect.

9.6.15 At Viewpoint 3, the manure heap on the horizon is located on land approximately 3m higher and 60m further to the west of the crest of the screen bund 18 that would be installed to the east of Phase 4 (in the original scheme only). Bund 17 to the east of Phase 5 would be largely hidden by intervening hedgerow planting that would be retained and reinforced as part of the proposals. New built development as part of 22/040/OUT would be screened by retained belt of pine trees in the far right of the view, although successive visibility of new built development along Park Gate Road would be available (beyond the extent of presented photography). There would be a Neutral cumulative visual effect.

9.6.16 At Viewpoint 4, situated further east along Park Road, more elevated views towards the screen bunds would be largely prevented by a belt of intervening pine trees. Any changes to the views and landscape character available would be restricted to the growth of advanced woodland planting on the horizon between the belt of pine trees and Castle Barns, however the Lea Castle mixed use development (22/040/OUT), assuming it is permitted and under construction, would likely largely restrict and eventually fully screen any views towards the Appeal Site. There would be a Neutral cumulative visual effect.

9.6.17 Viewpoints 5 and 6 to the southeast are from the urban edge of Kidderminster and views would include combined visibility of the Lea Castle mixed use development (22/040/OUT) and the eastern edge of Phases 4 and 5, although this would be restricted to temporary views of the grass seeded bunds associated with Phase 4 and to a lesser extent Phase 5, partially screened by existing vegetation that would be reinforced with new planting. The agricultural land to the east of the extraction area within the Appeal Site would be maintained. There would be a Neutral cumulative visual effect.

9.6.18 Viewpoint 8, was taken from a locally elevated location where a public bridleway coincides with the access track to Castle Barns. There would be limited views of the Lea Castle mixed use development that would appear 'sandwiched' between the urban edge of Kidderminster in the background and the roofscape of Castle Barns and planting in the foreground. There would be no potential for any significant effects on the visual amenity of bridleway users or landscape character. The Proposed Development during Phases 4 and 5 would have a temporary Moderate Adverse effect that is Not Significant because of the direction of the working faces of mineral extraction, partly mitigated by advance planting and perimeter bunds. The cumulative effects upon landscape character and visual amenity resulting from views of both schemes would be Neutral i.e. not discernibly greater than for either scheme individually, noting the primary changes to views would result from temporary views of Phases 4 and 5. There would be a Neutral cumulative visual effect.

<u>18/0163/FUL – 91 dwellings at Stoubridge Road</u>

9.6.19 The residential development has now been constructed and views from the northern edge of the new development would be similar to nearby Viewpoint 5. Views would include combined

visibility of the Lea Castle mixed-use development (22/040/OUT) and the eastern edge of Phases 4 and 5, although this would be restricted to temporary views of the grass seeded bunds associated with Phase 4 and to a lesser extent Phase 5, partially screened by existing vegetation that would be reinforced with new planting. The open agricultural land to the east of the extraction area within the Appeal Site would be maintained. There would be a Neutral cumulative visual effect.

22/0235/PIP – 4 dwellings at Wolverley Lodge

9.6.20 The approved development is located to the northwest of Brown Westhead Park playing fields. The site adjoining the playing fields is bordered by tall conifer screens and other tree cover and any heavily filtered views of the proposed development from the playing field (Viewpoint 21) would not constitute a cumulative effect as the Proposed Development, including screen bunds, on the Appeal Site would not be visible. There would be a Neutral cumulative visual effect.

20/0217/FUL - Erection of 4 x two-bed bungalows

9.6.21 The completed development on Brown Westhead Park is located to the east of the Appeal Site and is set down at a lower level such that there is no opportunity for any views of the Proposed Development from the bungalows themselves. Viewpoint 20 from the public footpath located between the two schemes, illustrates the very restricted views of the Appeal Site through woodland, however these views are only available intermittently from the public footpath on higher ground east of the bungalows. Very limited views of both developments are available from the footpath simultaneously (i.e., by turning one's head), however given the screening role of mature woodland cover, even in winter, it is assessed that the cumulative visual effect would be Neutral.

Cumulative Landscape and Visual Conclusions

9.6.22 The landform characteristics of the Site and surrounding land, implementation of advance planting, reinforced existing planting and grass seeded screen bunds, would in combination result in very limited cumulative effects with other developments recently constructed, permitted or in the planning system during the operational phase of the development. Where very limited cumulative visibility of both schemes is available, the resulting level of cumulative effect on landscape character and visual amenity would be Neutral i.e., not discernibly greater than for the Proposed Development (both the original and revised schemes) or other development proposals individually.

Impact of Noise

9.6.23 A Noise Assessment submitted with the original planning application was carried out by WBM Acoustic Consultants in order to establish baseline noise levels, make recommendations regarding site noise limits at the nearest dwellings to the site, and to test compliance with

those noise limits to examine the potential noise impact of the proposed development. The potential impact is considered using the known noise output of mineral activities and specific plant and equipment proposed to be used, assessed against the sensitivity of the noise receptor. An updated noise assessment with updated calculation has also been prepared taking into alterations to the proposed scheme.

9.6.24 The original noise calculations assumed that all plant on site is operating simultaneously in the closest likely working areas to each receiver location for the proposed operations, in order to assess a 'worst-case' scenario. The updated calculations have repeated these calculations for each phase, with the worst case (highest) value presented in the updated noise assessment. Both the original and updated Noise Assessments conclude that calculated site noise levels due to mineral operations at the proposed site comply with the suggested site noise limits at all assessment locations.

9.6.25 As part of the previous Appeal, cumulative impact was addressed in the evidence of Ms Rachel Canham, with noise from construction activities at the Lea Castle Village site considered to be the most significant noise source associated with other developments that may have an impact on the noise sensitive receptors.

9.6.26 If construction noise was at the possible maximum limit at a noise sensitive receptor, noise from the quarry would be insignificant compared to the potential construction noise from the housing development. As such, the addition of site noise from the quarry would not change the cumulative noise impact at this receptor, as the noise environment would be controlled by construction noise.

9.6.27 Construction noise will be variable and temporary, and only likely to be in close proximity to any noise sensitive receptors for relatively short durations. In addition, the calculated site noise levels due to the quarry are worst cases, assuming simultaneous extraction and infilling operations occurring at the nearest parts of the quarry to the receptor, which would not happen in practice. Taking this into account, the cumulative impact from both normal site activities from the quarry and construction operations is unlikely to be significant at any receptor.

9.6.28 Concern had been previously raised by WCC about the cumulative impact on Heathfield Knoll School and the nursery. These are located approximately 1 kilometer from the Lea Castle Village site. At this distance, any construction noise from the Lea Castle site is highly unlikely to be significant at the school and nursery, and as such would not change the impact assessment of quarry noise affecting this receptor.

9.6.29 As such, the consideration of cumulative impact does not alter the outcome of the original or updated noise assessment of the site.

9.6.30 In terms of the Bungalow, it is accepted that the noise levels are on the limit for the receptor, however, this level is within the acceptable threshold, is a worst case scenario. It should also

be noted that the noise limits are based on the baseline noise levels obtained in 2018, which appear to have been undertaken under 'worst case' (i.e. quiet) conditions resulting in lower background noise levels than would be likely to occur normally under different / stronger wind conditions. The suggested noise limits derived from the 2018 baseline, are therefore a 'worst case', resulting in more stringent / conservative noise limits than might occur based on 2023 or more recent survey data as set out in chapter 5 of this ES Addendum.

9.6.31 In conclusion, with the appropriate noise mitigation in place, the proposed development does not come close to the thresholds of being an unacceptable adverse impact in regards to noise.

Dust and Air Quality

9.6.32 The principal development requiring consideration with regards to potential cumulative impacts in relation to air quality and dust is the proposed wider Lea Castle Village which is currently awaiting determination.

Dust

9.6.33 In the event the Proposed Development was to occur simultaneously with the wider Lea Castle Village development (if consented) Castle Barns would lie within the relevant screening distances of both developments with regards to deposition dust and could therefore be subject to cumulative impacts. No other such receptors have been identified. The risk of any such cumulative impacts would however only occur if extraction and restoration activities occurred in Phases 4 and 5 of the Proposed Development at the same time as construction activities in the western areas of the wider Lea Castle Village development.

9.6.34 The Air Quality Assessment provided with the wider Lea Castle Village planning application included a construction dust assessment and provided recommend mitigation measures to be implemented during the construction phase to ensure construction effects were negligible. It is presumed such measures would be agreed as part of a Reserved Matters if permission was granted such as would be provided within a Construction Environmental Management Plan (CEMP), as for the core Castle Lea Village development.

9.6.35 Castle Barns is located upwind of the prevailing wind direction across the proposed wider Lea Castle Village. Taking into account the distances and orientation from the two development sites to the receptors at Castle Barns there could be, at most a *low* dust impact risk and *slight* adverse dust effect. However as noted above this would only potentially occur if operations occurred in the eastern part of the proposed quarry at the same time as operations in the western part of the proposed Lea Castle Village. With the implementation of appropriate standard dust mitigation measures at both sites the cumulative impacts are not significant.

PM_{10}

9.6.36 In the event the Proposed Development was to occur simultaneously with the wider Lea Castle Village development (if consented) this may also result in cumulative contributions of PM_{10}

(and $PM_{2.5}$). The finer particulate matter may travel longer distance than larger dust particles. However, as for larger particles the concentrations reduce rapidly from source through deposition and dispersion. Furthermore, the standard dust mitigation measures that would be implemented at both developments would serve to reduce PM_{10} (and $PM_{2.5}$) emissions.

9.6.37 Background concentrations of PM_{10} (and $PM_{2.5}$) in the area are predicted to be well below the AQOs. There are no sensitive receptors that lie within close proximity, and downwind, of both the Proposed development and wider proposed Lea castle Village development.

9.6.38 In the worse-case scenario of extraction and restoration taking place in Phases 4 and 5 of the proposed development simultaneously with construction of the western part of the wider Lea Castle Village, PM_{10} (and $PM_{2.5}$) concentrations are predicted to remain well below the relevant AQOs.

Traffic Emissions

9.6.39 The planning application for the recent wider Castle Lea Village application included an air quality assessment which included atmospheric dispersion modelling of vehicle emissions and assessment of changes in NO_2, PM_{10} and $PM_{2.5}$ concentrations at a large number of receptor points. This modelled traffic flows on the wider local road work for 2018 as 'baseline' and for 2024 'with and without' development, 2024 being the project first year of occupation. The assessment states that the traffic data included potential traffic flows from the Lea Castle Quarry.

9.6.40 Proposals are for the wider Lea Castle Village development to be provided with 6 access points. This would serve to distribute the development-related traffic movements extensively on the wider local road network, with reported resulting decreases on some roads and increases on others. Predicted impacts due changes in NO_2, PM_{10} and $PM_{2.5}$ concentrations due to the wider Lea Castle Village development were predicted to be *negligible* with all resulting concentrations of NO_2, PM_{10} and $PM_{2.5}$ remaining comfortably below the relevant AQOs at all modelled receptor locations.

9.6.41 Taking this into account, and the comments above in Chapter 6 in relation to the proposed quarry development, cumulative impacts due to traffic emissions and impacts on local air quality are not predicted to be significant.

Ecology & Nature Conservation

9.6.42 This section of the updated Cumulative Impact Assessment submitted in February 2023 remains valid.

9.6.43 While there is potential for some impact, the proposed development is not considered close to becoming an unacceptable adverse impact on ecology.

Transport Impact

9.6.44 This section of the updated Cumulative Impact Assessment submitted in February 2023 remains valid.

9.6.45 The traffic and transport impacts of the proposal do not come close to the thresholds of unacceptability.

Water Environment

9.6.46 This section of the updated Cumulative Impact Assessment submitted in February 2023 remains valid.

9.6.47 The potential impact on water resources of the proposal do not come close to the thresholds of unacceptability.

Archaeology and Cultural Heritage

Archaeology

9.6.48 This section of the updated Cumulative Impact Assessment submitted in February 2023 remains valid.

Cultural Heritage

9.6.49 The proposed changes to the scheme (when compared to that assessed in 2019), such as bund heights, bund locations, phasing during extraction and restoration; and the types of machinery that would be deployed, when considered individually and / or cumulatively would result in no material adverse or beneficial impacts.

9.6.50 In summary therefore, the proposed development is not considered close to becoming an unacceptable adverse impact on archaeology or cultural heritage receptors.

Soils and Land Quality

9.6.51 This section of the updated Cumulative Impact Assessment submitted in February 2023 remains valid.

9.6.52 In order to protect and conserve soil quality as required in the adopted Development Plan, soil storage and handling measures are recommended in the Report at Technical Appendix G. These measures are to be implemented in the scheme of soil storage and handling employed at the site.

9.6.53 The impact of the proposal on soils and agricultural land quality does not come close to the thresholds of unacceptability.

Arboriculture

9.6.54 This section of the updated Cumulative Impact Assessment submitted in February 2023 remains valid.

9.6.55 In conclusion it is considered that the impacts of the proposal upon arboriculture are not considered to be in themselves unacceptable nor near the thresholds of becoming an unacceptable environmental impact.

Lighting

9.6.56 This section of the updated Cumulative Impact Assessment submitted in February 2023 remains valid.

9.6.57 The proposed development does not come close to the thresholds of being an unacceptable adverse impact.

Climate Change

9.6.58 In terms of cumulative effects on carbon emissions, the projected emissions from the proposed development can be considered in the context of the sand and gravel extraction industry's contribution to the UK's projected emissions overall. Since the projected carbon intensity of extraction indicates a reduction of at least 25% below the industry benchmark, then the cumulative impact is considered significantly beneficial. As regards the cumulative effect of the proposed development on resilience to climate change in the local area, the site restoration to vegetated areas and a water body are anticipated to have a neutral effect on average temperature increases and rainfall intensity.

Conclusions on the Potential Impacts

9.6.59 In terms of individual areas of potential impact, it is concluded that there would be no individual areas of objectionable environmental impact arising from the proposal. Potentially the most substantial effect that could contribute the most to cumulative harm is the impact upon the landscape character and visual appearance of the site during the course of the temporary operations. In the longer term, however, the restoration of the site would bring about overall improvements in landscape character and ecological enhancement.

9.7 Assessment of the Combination of Potential Impacts

Introduction – Methodology (Mr J. Burton)

9.7.1 In his judgement (reference EWHC Admin 1427 2007) Mr Justice Burton took the view that to make an assessment of cumulative impact on the basis of simple value judgements with no supporting reasons is inappropriate. In order for a 'proper assessment' to be carried out in the context of MPS 2 he outlined four possible tests that could be employed.

9.7.2 The assessment of the combined potential negative effects of the Lea Castle Farm proposals therefore generally follows Mr Justice Burton's approach and is set out below.

Test 1 - Even though each individual area of potential impact was not objectionable yet each such feature was close to objectionability that, although none could be said to be individually

objectionable, yet because each was nearly objectionable, the totality was cumulatively objectionable.

9.7.3 In Section 3.2 above it has been considered that each individual area of potential impact is not, on balance, objectionable. Given the nature of mineral development, it is acknowledged though that the potential Landscape and Visual impact of the scheme would come close to the thresholds of acceptability. Although the potential noise, traffic and ecological impacts of the scheme would give rise to some negative impacts during the course of the operations, there would be no direct conflict with development plan policy and these individual issues would not come close to being objectionable. Similarly, the potential impacts on interests related to the water environment, archaeology, soils/land quality, arboriculture and lighting are not considered to come close to being objectionable on an individual basis.

9.7.4 Therefore, overall, only one of the individual areas of potential impact is considered to be close to being objectionable (Landscape and Visual impact). Whilst it is accepted that other individual areas would give rise to varying degrees of negative impact during the course of the development, they would not come close to being objectionable on an individual basis. It is therefore concluded that, because only one feature is considered to be close to being objectionable, and the other impacts do not come close to being objectionable or conflict with Development Plan Policy, the totality would not be objectionable.

Test 2 - One, two, three or four of the particular features were close to being objectionable and that would be an important matter to take into account when looking at the totality.

9.7.5 In this case only one particular feature is close to being objectionable; namely Landscape and Visual Impact. Therefore, we have to judge how important that matter is. To do this we have looked at how sensitive the area is in terms of landscape and visual matters. In this regard the site is not situated in an area of high landscape value (e.g. AONB, National Park etc) or designated as an Area of Local Landscape Significance in the Wyre Forest District Local Plan.

9.7.6 The site is located wholly within the West Midlands Green Belt. The primary function of this designation, however, is not to protect the landscape quality of the site or the surrounding area but to primarily prevent the coalescence of towns and preserve the openness of the countryside. The proposed development would, notwithstanding its duration, be a temporary activity and whilst the proposal would disturb the site for a period of time, it would be progressively returned to an open state following completion of extraction and would be no more built up on completion of the development as a result of the proposal as it is now. There would be no permanent spatial or visual impact on the Green Belt.

9.7.7 Open views of the site would be possible from a number of public locations, particularly in elevated positions around the site during the temporary operational phases of the proposed development. For the most part the potential sensitive visual receptors are representative of a typical development of this nature and are not therefore elevated in terms of importance.

9.7.8 The absence of any specific landscape designations or specific development plan policy does not highlight any specific concerns and therefore raise its importance in the planning balance. The main potential negative visual impacts are only short term and in the medium to long term the restoration of the site would improve the character and visual interest of the landscape. There is not therefore any combination of particular features that are considered to be important matters that could give rise to objections in regard to test two.

Test 3 - One particular combination of two or three otherwise unobjectionable features could cause objectionability in their totality.

9.7.9 In consideration of this matter there are individual features (impacts) which are related in terms of subject matter or in regard to the receptors in which they have the potential to impact upon and could therefore be considered in combination, namely:

1. Landscape/Visual Impact and Ecological Impact; and
2. Local Amenity impacts such as Noise, Dust and Traffic.

9.7.10 In relation to point one, as discussed above, the predicted landscape and visual effects are considered to be close to being objectionable. The short to medium term negative impacts would though be mitigated by the long term overall improvements in character and visual interest of the landscape. Given that the potential ecological impact of the proposal is not judged to be close to being objectionable it is considered that in combination their totality would not amount to being objectionable.

9.7.11 In relation to the second suggested combination (local amenity impacts), none of the individual features are likely to give rise to direct conflict with development plan policy or exceed nationally recognized thresholds of potential nuisance related impacts. No major concerns are predicted in regard to HGV traffic resulting from the proposal. It is considered that because the potential impacts of noise, dust and traffic on local communities and individual properties (i.e. the nearest sensitive receptors) individually would each be well within the thresholds of objectionability their combined totality would not be objectionable.

9.7.12 In the light of the above it is concluded that there are no particular combination of two or three otherwise unobjectionable features that could cause objectionability in their totality.

Test 4 - As was specifically addressed by the Interested Party and by the Inspector here, and found not to be the case, there could be some unusual feature or some unusual combination of features such as to render the combination objectionable when the individual feature was not.

9.7.13 For the most part, the site and surroundings are typical in relation to the potential sensitive receptors, the issues and the potential impacts that tend to arise from mineral development of this nature.

9.7.14 The potential impact of noise upon receptors would comply with the development plan and well within the recognised limits set out in PPG. The potential impacts of noise would be short term and would not therefore come close to being objectionable on potential receptors.

9.7.15 Dust emissions from the proposed development are short term and would be controlled well within nationally recognised criteria by the use of a dust management plan and effective on site dust mitigation techniques and would not come close to being objectionable.

9.7.16 To therefore conclude on the fourth test, noise and dust impacts are well within the thresholds of objectionability. It is therefore concluded that because none of the two potential impacts comes close to being objectionable their combined impact do not accumulate to being objectionable.

Conclusions

9.7.17 It is considered the approach and methodology to assessing the combined negative effects is thorough and robust. Following an assessment of each of the four tests it has been concluded that no objectionable combined negative effects would be brought about by the proposed development of Lea Castle Farm.

9.8 Other Potential Beneficial Effects

9.8.1 This section of the updated Cumulative Impact Assessment submitted in February 2023 remains valid.

9.8.2 It can be concluded that the benefits resulting from this proposed development are substantial and wide reaching and are considered to combine to provide a significant positive impact, which acts as a counter weight to the negative impacts.

9.9 Overall Conclusions – Cumulative Impact, Combined Positive and Negative Effects

9.9.1 The approach to assessing cumulative impact has followed the advice of Mr Justice Burton (in the Long Moor case) by considering the three categories of potential cumulative effects: successive effects; simultaneous effects from concurrent developments; and combined effects from the same development and then sets out reasoning behind the judgements reached.

9.9.2 The assessment of cumulative impact has had regard to positive and negative effects to ensure that an overall balanced judgement is reached. The potential positive impacts are particularly relevant when considering the combined effects from the same development. Care has been taken to ensure that any positive effects have not been double counted in the assessment work.

9.9.3 The assessment of successive effects has concluded that no significant adverse cumulative impact would occur from the proposed extension to the Lea Castle Farm site.

9.9.4 In terms of the assessment of simultaneous effects, the potential combined effect of the development of the planning application to the east of the site (application ref: 22/0404/OUT) being constructed at the same time as the proposed extension area is only likely to marginally increase the degree of overall impact. No objectionable concurrent effects are therefore likely to arise.

9.9.5 In terms of the combined effects, the only individual negative environmental impact that is considered to come close to the thresholds of being objectionable is the potential temporary landscape and visual impact of the scheme. The other environmental features are not considered to make a substantial contribution to cumulative harm. Given that only one feature is close to the thresholds of objectionability, and having regard to the fact that none of the environmental features have a synergistic effect, their combined impact is not objectionable. This conclusion has been reached having regard to the four tests recommended by Mr Justice Burton.

9.9.6 The proposal would have a number of positive effects which act as a counter weight to offset the identified negative impacts. The main points in relation to the benefits are that the proposal would meet a need for sand and gravel and bring about economic benefits and biodiversity gains.

9.9.7 In the light of the above it is concluded that the cumulative impacts of the scheme do not justify refusal of planning permission. This conclusion has been reached having regard in particular to the impact of each individual effect (each of which has been assessed to be well below the level of unacceptability, even when assessed in combination with other on-going or committed development), the temporary nature of the development, and the short, medium and long term benefits that the proposals will deliver.

10 Conclusion

10.1 Introduction

10.1.1 This ES Addendum addresses the change to the proposed mineral processing plant to one of a smaller size, and with a reduced operational acoustic volume, compared to that proposed and assessed within the original application scheme. This has allowed for the reduction in the number, height and / or duration of temporary soil storage / screening bunds and minimising the time when quarry operational land is required.

10.1.2 This Addendum therefore provides an update to the findings of the original Environmental Statement (ES) and associated Regulation 25 submissions prepared for Planning Application Ref: 19/000053/CM and Appeal Ref: APP/E1855/W/22/3310099. It has been prepared in accordance with The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

10.1.3 The potential effects of the proposal are described fully within this Main Report. A Non-Technical Summary is also provided; this contains a description of the proposal and a summary of the ES, expressed in non-technical language.

10.1.4 An assessment of alternatives to the proposed scheme have been considered and set out that the revised scheme is the most effective and efficient development option, which will allow for the very swift progressive restoration of land whilst mitigating / reducing potential environmental and amenity effects over the temporary and relatively short life of the proposed development.

10.1.5 The potential effects of the proposal as identified in the ES Addendum are summarised below.

10.2 Landscape and Visual Impact

10.2.1 Chapter 4 of this report provides an assessment of landscape and visual related environmental impact(s) of the proposal.

10.2.2 The original ES concluded that whilst the proposals would result in some short or medium term disturbance to landscape character and views experienced in the vicinity of the site, these localised adverse effects would be not significant. This conclusion reflects the important role of screening bunds in limiting visibility of the extraction and progressive restoration activity that is typical during the life of sand and gravel extraction.

10.2.3 In the long-term, once the parkland landscape has matured, the proposed development would have a significant beneficial landscape character effect, relative to the existing baseline. There would also be improvements (not significant) to the visual amenity of public rights of way users passing through the Site.

10.2.4 The revised proposals would result in some short and medium term improvements to the landscape character and views of some receptors, relative to the existing scheme. These changes would be most clearly perceived from bridleway 626 (B) that passes the plant site (Viewpoints B and C) and the rear of the Bungalow (Viewpoint 17c), with more modest improvements as a result of the reduction in height of the screen bunds around the plant site experienced from Footpath 624 (B) (Viewpoint D). Improvements in visual impact compared with the original scheme would also be observed in views from the west as a result of the reduction in number and height of the temporary screen bunds (Viewpoints 1, 2, 3, 5, 6, and 9).

10.2.5 The landscape and visual improvements from a reduction in height of selected temporary screen mounds, whilst an improvement in landscape and visual terms are assessed not to result in a reduction in a change to the overall magnitude of change and associated effects assessed for the original scheme. This conclusion is reached because the LVIA methodology, based on best practice guidance, contains broad assessment categories and judgements have to take into account the overall areas of disturbance and associated timescales, which do not materially change. Landscape and visual effects during the operational phase would continue to be not significant for the short to medium term with significant long term beneficial landscape effects.

10.2.6 It was assessed that there would be no significant adverse cumulative landscape or visual effects from the original scheme. The other development schemes previously assessed as part of the cumulative baseline remain unchanged and consequently the cumulative assessment conclusions remain unchanged, noting the reduction in the size and number of screen bunds would not result in any change to the nature of potential cumulative effects with other developments.

10.3 Noise

10.3.1 Chapter 5 of this report has primarily considered the implications of the proposed revised scheme with regards to noise aspects. The review has also considered any updates to relevant policy, legislation and guidance in relation to noise. Any identified changes have been assessed to determine the potential implications on the original assessment findings and presented mitigation recommendations and these are discussed in this Chapter. Where necessary revised assessment and mitigations options are provided.

10.3.2 The original ES concluded that the proposal has been found to be acceptable in terms of noise, for both normal and temporary operations at sensitive receptors located off site. The assessment found that with appropriate measures the relevant site noise limits for normal operations, based on PPGM, are met. The proposed development also complied with noise limits for temporary operations.

10.3.3 There are no changes to the proposed temporary operation so the findings are unchanged from the original assessment.

10.3.4 This updated assessment presents the noise assessment for the proposed revised scheme.

10.3.5 The changes to the processing plant, mobile plant, bund formation and operations in Phase 1 have been reviewed with regard to noise. It remains concluded that, with the implementation of mitigation measures set out in this assessment, the proposed development would not result in significant adverse impacts with regard to normal and temporary operations.

10.3.6 Overall, it remains concluded that with the incorporation of appropriate mitigation the Proposed Development complies with the relevant national and local planning policies in relation to noise. It is considered the Site is suitable for the Proposed Development and there is no reason on the grounds of noise why the development proposals should not be granted planning permission.

10.4 Air Quality and Dust

10.4.1 Chapter 6 of this report has primarily considered the implications of the proposed revised scheme with regards to dust and air quality aspects. The review has also considered any changes in relevant policy, legislation and guidance in relation to dust and air quality, along with any changes in baseline conditions, that have occurred since preparation of the Original ES. Any such identified changes have been assessed to determine the potential implications on the original assessment findings and presented mitigation recommendations and are discussed in the chapter. Where necessary revised assessment and mitigations options are provided.

10.4.2 The original ES concluded that it is unlikely that any significant decrease in local air quality will occur due to the proposed development at Lea Castle Farm Quarry. Any dust occurrence event will be limited and of short duration and will be minimised by implementation of the dust control recommendations.

10.4.3 With regards to PM_{10} and $PM_{2.5}$ dust levels from the site, analysis was made of the air quality data. The conclusion of the analysis was that AQO will not be exceeded.

10.4.4 Overall, the effect on air quality of the proposed development with the implementation of suitable dust mitigation measures was considered to be not significant.

10.4.5 The changes to the processing plant and soils placement scheme have been reviewed along with changes in legislation, policy and baseline air quality conditions since the Original ES.

10.4.6 It remains concluded that, with the implementation of standard dust mitigation and control measures, the proposed development would not result in significant adverse impacts and effects due to dust on local receptors, both with regards to dis-amenity dust and PM_{10} / $PM_{2.5}$.

10.4.7 Emissions associated with HGV and LGV movements to / from the site are also not predicted to result in significant adverse impacts on local air quality.

10.4.8 Overall, it remains concluded that with the incorporation of appropriate mitigation the Proposed Development complies with the relevant national and local planning policies in relation to air quality and dust. It is considered the Site is suitable for the Proposed Development and there is no reason on air quality grounds why the development proposals should not be granted planning permission.

10.5 Archaeology and Cultural Heritage

10.5.1 Chapter 7 of this report provides an assessment of archaeology and cultural heritage impact(s) of the proposal.

10.5.2 The Original ES anticipated and reported no significant effects on designated or non-designated cultural heritage assets. Cultural Heritage was not identified as a reason for refusal in the original application. The Appeal Decision confirmed that any perceptions of harm to heritage assets would be demonstrably outweighed by the public benefits of the scheme, ensuring compliance with all legislative duties and national / local policy that seeks to safeguarded cultural heritage significance.

10.5.3 The proposed changes to Appeal Scheme will have no material effect on proximate heritage assets and would in no way alter the assessment or conclusions reported in the Original ES or in the Appeal Decision.

10.6 Climate Change

10.6.1 Chapter 8 of this report provides an assessment to undertake an assessment of the Greenhouse Gas (GHG) emissions associated with sand and gravel extraction at Lea Castle Farm, and assess the risks of climate change on the development.

10.6.2 The results of the carbon assessment, defining the baseline and estimating future GHG emissions, found that the impact of future operations on GHG emissions at the site has a minor to moderate beneficial significant impact, compared to the mineral industry benchmark for sand and gravel extraction. Mitigation measures may also be considered in order to reduce the future emissions and reduce the overall carbon footprint of the site. Emissions reductions over baseline of a reasonable percentage are possible for the operation if it gains consent. This is in line with the UK's trajectory towards net zero by 2050.

10.6.3 The project overall may give rise to an emission of around 30,000 tonnes of CO2 equivalent, extrinsic to the mineral use. This a trivial quantity in comparison to two well-known mineral development applications: the proposed oil extraction in Surrey and the West Cumbria coal mine.

10.6.4 The climate baseline has been defined and future climate projections made following

published climate models to predict the effects of climate change on site. The predicted climate change effects on site were defined as an increase in summer and winter temperatures, an increase in winter precipitation, a decrease in summer precipitation and an increase in extreme weather events. The effects of climate change on site are considered to be negligible to slight, and as such, there will be no significant adverse effects due to climate change. The site resilience (i.e. considering human, infrastructure and environmental receptors) to the effects of climate change were assessed, and the effects of climate change will be Not Significant.

10.6.5 The proposed operation is relatively resilient to the effects of climate change. It is not possible to mitigate all risks associated with climate change but through the results presented in this assessment, these risks identified are considered acceptable. The overall impact of climate change on the Proposed Scheme is Not Significant.

10.7 Cumulative Impact

10.7.1 This ES Addendum has given consideration of the impact of the proposed development in terms of successive and simultaneous effects on the general locality.

10.7.2 A Cumulative Impact Assessment was carried out as part of the original application and formed part of the Environmental Statement at Chapter 22. The Environmental Statement concluded that there are no cumulative impacts that would arise from the scheme in combination either within itself or with other existing / proposed developments that would render the proposed quarry extension unacceptable.

10.7.3 These findings were accepted by Worcestershire County Council's Head of Strategic Infrastructure and Economy, with paragraph 871 of the Committee Report setting out the following:

"On balance, the Head of Planning and Transport Planning does not consider that the cumulative impact of the proposed development would be such that it would warrant a reason for refusal of the application".

10.7.4 Cumulative Impact was not set out by members of the Planning and Regulatory Committee as a reason for refusal.

10.7.5 A further updated Cumulative Impact Assessment was submitted in February 2023 in response to the Environmental Services Department of the Planning Inspectorate requesting further information under Regulation 25 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017. This concluded that the cumulative impact of the scheme does not weigh against the scheme to a degree that the Planning Inspector should form a cumulative reason to object to the proposal. In reaching this view particular regard has been given to the temporary nature of the development and the short, medium and long term benefits that would arise.

10.7.6 The approach to assessing cumulative impact has followed the advice of Mr Justice Burton (in the Long Moor case - The Queen (on the application of Leicestershire County Council) v. the Secretary of State for Communities and Local Government and UK Coal Mining Ltd (2007) EWHC Admin 1427) by considering the three categories of potential cumulative effects: successive effects; simultaneous effects from concurrent developments; and combined effects from the same development and then sets out reasoning behind the judgements reached.

10.7.7 The assessment of cumulative impact has had regard to positive and negative effects to ensure that an overall balanced judgement is reached. The potential positive impacts are particularly relevant when considering the combined effects from the same development. Care has been taken to ensure that any positive effects have not been double counted in the assessment work.

10.7.8 The assessment of successive effects has concluded that no significant adverse cumulative impact would occur from the proposed extension to the Lea Castle Farm site.

10.7.9 In terms of the assessment of simultaneous effects, the potential combined effect of the development of the planning application to the east of the site (application ref: 22/0404/OUT) being constructed at the same time as the proposed extension area is only likely to marginally increase the degree of overall impact. No objectionable concurrent effects are therefore likely to arise.

10.7.10 In terms of the combined effects, the only individual negative environmental impact that is considered to come close to the thresholds of being objectionable is the potential temporary landscape and visual impact of the scheme. The other environmental features are not considered to make a substantial contribution to cumulative harm. Given that only one feature is close to the thresholds of objectionability, and having regard to the fact that none of the environmental features have a synergistic effect, their combined impact is not objectionable. This conclusion has been reached having regard to the four tests recommended by Mr Justice Burton.

10.7.11 The proposal would have a number of positive effects which act as a counter weight to offset the identified negative impacts. The main points in relation to the benefits are that the proposal would meet a need for sand and gravel and bring about economic benefits and biodiversity gains.

10.7.12 In the light of the above it is concluded that the cumulative impact of the scheme does not weigh against the scheme to a degree that the Planning Inspector should form a cumulative reason to object to the proposal. In reaching this view particular regard has been given to the temporary nature of the development and the short, medium and long term benefits that would arise.

10.8 Summary

10.8.1 In considering the results of the ES Addendum, it can be concluded that the assessments have shown that the proposal would not, subject to the mitigation set out above and within the original ES, result in any significant adverse environmental effects which would warrant the refusal of planning permission.

Appendix A - Visualisations and Viewpoint Location Plan - Figures 4.1 to 4.70

Appendix B.1 – 2023 Baseline Survey Details & Results

Appendix B.2 – Noise Survey Locations