Heidelberg Materials

Produced by

LANDESIGN
PLANNING & LANDSCAPE

CASTLE CEMENT LTD, KETTON WORKS, KETCO AVENUE, KETTON, RUTLAND, PE9 3SX

Regulation 25 Response

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

PLANNING APPLICATION 2024/0066/MIN

Proposed extensions to Grange Top Quarry, for construction and use of a new access and site access road from the A606, a security gatehouse, bridleway bridge and associated works to facilitate the continued supply of minerals to Ketton cement works, the consolidation of existing mineral extraction permissions and a restoration scheme to recreate agricultural land and biodiversity enhancement works.

December 2025

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UPDATED PLANS LIST

THE DEVELOPMENT PLANS LISTED BELOW ARE COMMON TO BOTH THE PLANNING STATEMENT AND THE ENVIRONMENTAL STATEMENT.
(WHERE A PLAN HAS BEEN REPLACED THE NEW PLAN IS HIGHLIHGTED IN GREEN WHILST THE SUPERSEDED PLAN IS SHOWN WITH A STRIKE THROUGH AND RED SHADING)

Plan Reference	Date	Title	Plan to be replaced	Date	Paper size
General (location, application area and landholding)					
L-KE-PA rev A	April 2025	Planning Application Area (Showing location, planning application area and land ownership boundary)	~~L-KE-PA~~	~~Sept 2023~~	A3
Extent of Permitted Quarry and Restoration Schemes *These two plans are already permitted under the existing mineral extraction planning permissions but are included to define the extent of the existing permitted mineral reserve and the associated restoration scheme such that the permitted workings can be incorporated into a consolidating permission with the extension areas.* *Should planning permission be granted for this application, the restoration scheme 832.36K will be superseded by the development plans listed below which already incorporate 832.36K and expand on it to incorporate the extension areas. See Environmental Statement – Appendix 2 for existing quarry planning permission documents.*					
LD89-KET-001a	Sept' 2017	Proposed Diversion of Empingham Road.	No change	No change	A3
832.36K	8 Sept 2017	Indicative Final Restoration Plan Following Discussion with Natural England Including Retention of Part of Ketton Gorse	No change	No change	A3/A1

Indicative masterplans *(This series of masterplans shows how the whole of the site works together as Field 14 and NW Land will be worked at the same time. These plans are intended as a high-level overview of the proposals. For details for each extension area, a separate series of more detailed plans is also submitted at a larger scale.)*					
MASTERPLAN - SITE PREP-A	April 2025	Indicative Masterplan - Site Preparation	~~MASTERPLAN - SITEPREP~~	~~Sept 2022~~	A3
MASTERPLAN - YEAR 1-A	April 2025	Indicative Masterplan – Year 1	~~MASTERPLAN - YEAR 1~~	~~Sept 2022~~	A3
MASTERPLAN - YEAR 5-A	April 2025	Indicative Masterplan – Year 5	~~MASTERPLAN - YEAR 5~~	~~Sept 2022~~	A3
MASTERPLAN - YEAR 10-A	April 2025	Indicative Masterplan – Year 10	~~MASTERPLAN - YEAR 10~~	~~Sept 2022~~	A3
MASTERPLAN - YEAR 15-A	April 2025	Indicative Masterplan – Year 15	~~MASTERPLAN - YEAR 15~~	~~June 2023~~	A3
MASTERPLAN - YEAR 20-A	April 2025	Indicative Masterplan – Year 20	~~KE-MASTERPLAN - YEAR 20~~	~~June 2023~~	A3
MASTERPLAN - YEAR 25-A	April 2025	Indicative Masterplan – Year 25	~~MASTERPLAN - YEAR 25~~	~~Sept 2022~~	A3
MASTERPLAN-REST-A	April 2025	Indicative Masterplan - Final Restoration Plan.	~~MASTERPLAN-REST~~	~~Aug 2023~~	A2

Phasing Plans - Northwest Land (off A606 Stamford Road) (NW Land)					
KE-NW-SITEPREP-A	April 2025	Northwest Land - Indicative Working Plan	~~NW-WORKING PLAN~~	~~June 2023~~	A3
NW-WORKING PLAN-A	April 2025	Northwest Land - Indicative Site Preparation Plan	~~KE-NW-SITEPREP~~	~~June 2023~~	A3
NW-YR1-A	April 2025	Northwest Land - Year 1	~~NW-YR1~~	~~June 2023~~	A3

NW-YR5-A	April 2025	Northwest Land - Year 5	~~NW-YR5~~	~~June 2023~~	A3
NW-YR10-A	April 2025	Northwest Land - Year 10	~~NW-YR10~~	~~June 2023~~	A3
NW-YR15-A	April 2025	Northwest Land - Year 15	~~NW-YR15~~	~~June 2023~~	A3
NW-YR20-A	April 2025	Northwest Land - Year 20	~~NW-YR20~~	~~June 2023~~	A3
NW-YR25-A	April 2025	Northwest Land - Year 25	~~NW-YR25~~	~~June 2023~~	A3
NW-REST-A	April 2025	Northwest Land – Final Restoration	~~NW-REST~~	~~June 2023~~	A3
NW-SECTIONS-A	April 2025	Northwest Land – Illustrative Cross Sections	~~NW-SECTIONS~~	~~June 2023~~	A3
NW-SECTIONS-2-A	April 2025	Northwest Land – Illustrative Cross Sections IJ	~~NW-SECTIONS-B~~	~~June 2023~~	A3

Phasing Plans - Field 14 (off Empingham Road)					
F14-WORKINGPLAN-A	April 2025	Field 14 - Working Plan	~~F14-WORKINGPLAN~~	~~Aug 2023~~	A3
F14-SITEPREP- REVA	April 2025	Field 14 - Indicative Site Preparation Plan	~~F14-SITEPREP~~	~~Aug 2023~~	A3
F14-YR1-A	April 2025	Field 14 - Indicative Year 1	~~F14-YR1~~	~~Aug 2023~~	A3
F14-YR5-A	April 2025	Field 14 - Indicative Year 5	~~F14-YR5~~	~~Aug 2023~~	A3
F14-YR10-A	April 2025	Field 14 - Indicative Year 10	~~F14-YR10~~	~~Aug 2023~~	A3
F14-YR15-A	April 2025	Field 14 - Indicative Year 15	~~F14-YR15~~	~~Aug 2023~~	A3
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F14-YR25-A	April 2025	Field 14 - Indicative Year 25	~~F14-YR25~~	~~Aug 2023~~	A3
F14-REST-A	April 2025	Field 14 - Indicative Final Restoration	~~F14-REST~~	~~Aug 2023~~	A3
F14-SECTIONS-A	April 2025	Field 14 - Illustrative Cross Sections	~~F14-SECTIONS~~	~~Aug 2023~~	A3

F14-SECTIONS-KL-A	April 2025	F14 - Illustrative Cross Section KL	~~F14-SECTIONS-KL~~	~~Aug 2023~~	A3
F14-PARADISE FIELD	April 2025	Field 14 - Paradise Field Inset	NEW PLAN		A3

Public Rights of Way					
KE-ROW-A	April 2025	Proposed Public Access Summary	~~KE-ROW~~	~~May 2023~~	A3
KQE-TTE-SBR-B-DR-CB-1800 Rev.P01	Aug 2022	Combined Pedestrian / Equestrian Bridge Preliminary General Arrangement for Planning Purpose	No change	No change	A1
LD159-KQ-001a	Sept 2023	Bridleway Crossing *(Proposed crossing over the new Works Access)*	No change	No change	A3
KE-BD	Sept 2023	Temporary Bridleway Diversion	No change	No change	A3

New Cement Works Access Road from A606 Stamford Road *(Note this is for road going vehicles only, travelling between the A606 and the cement works. Internal quarry traffic will use a separate route between the face and the primary crusher)*					
KQE-TTE-00-XX-DR-D-0110 P01 Key	Aug 2022	Preliminary Design Key Plan	No change	No change	A0
KQE-TTE-00-XX-DR-D-0111-P02	May 2022	Preliminary Design – Roundabout Geometry Sheet 1	No change	No change	A0
KQE-TTE-00-XX-DR-D-0112-P01	May 2022	Preliminary Design – Roundabout Geometry Sheet 2	No change	No change	A0
KQE-TTE-00-XX-DR-D-0113-P02	May 2022	Preliminary Design – Haul Road Geometry Sheet 1	No change	No change	A0
KQE-TTE-00-XX-DR-D-0114-P02	May 2022	Preliminary Design – Haul Road Geometry Sheet 2	No change	No change	A0
KQE-TTE-00-XX-DR-D-0115-P01	May 2022	Preliminary Design – Haul Road Geometry Sheet 3	No change	No change	A0
KQE-TTE-00-XX-DR-D-0116-P01	May 2022	Preliminary Design – Haul Road Geometry Sheet 4	No change	No change	A0
KQE-TTE-00-XX-DR-D-0121-P01	May 2022	Preliminary Design Long Sections Sheet 1	No change	No change	A0
KQE-TTE-00-XX-DR-D-0122-P02	May 2022	Preliminary Design Long Sections Sheet 2	No change	No change	A0
KQE-TTE-00-XX-DR-D-0123-P02	May 2022	Preliminary Design Long Sections Sheet 3	No change	No change	A0
KQE-TTE-00-XX-DR-D-0124-P01	May 2022	Preliminary Design Long Sections Sheet 4	No change	No change	A0

KQE-TTE-00-XX-DR-D-0131-P01	May 2022	Vehicular Tracking - Roundabout	No change	No change	A0
KQE-TTE-00-XX-DR-D-0132-P02	May 2022	Vehicular Tracking – Haul Road	No change	No change	A0
KQE-TTE-00-XX-DR-D-0133-P02	May 2022	Vehicular Tracking - Haul Road	No change	No change	A0
KQE-TTE-00-XX-DR-D-0134-P02	May 2022	Vehicular Tracking - Haul Road	No change	No change	A0

Landscape and Environment Management Plan (LEMP)					
KE-NW-PLANT	Sept 2023	Northwest Land - Planting Plan	No change	No change	A2
KE-F14-PLANT	Sept 2023	Field 14 - Planting Plan	No change	No change	A2

EXECUTIVE SUMMARY

1. This Regulation 25 Response provides further information and targeted updates to accompany the environmental statement (the ES) and planning application 2024/0066/MIN, for two quarry extensions to Grange Top Quarry, that secure long-term limestone and clay reserves for Ketton Cement Works. The information addresses Rutland County Council's Regulation 25 Request and additional matters raised during public consultation.

Purpose and Scope of the Submission

2. The response clarifies various queries in relation to the scheme and its technical assessments. These include technical assessments on noise, dust, highway safety (Road Safety Audit Stage 1), carbon/climate change, design changes relating to Anglian Water assets and retention of Giant Redwood trees, and provides clarification on need, socio-economic importance, ecology, archaeology, rights of way, and planning policy. It also updates the cumulative effects, non-technical summary and the proposed mitigation measures.

Key Themes

Planning Policy

3. National policy recognises that cement is nationally important and essential to the construction industry. The adopted and emerging development plans in Rutland strongly support maintaining a viable cement industry and make allocations, through an Area of Search, for limestone and clay extraction for the manufacture of cement. The policy intention is to allow the life of Ketton Works to be extended by a minimum of 15 years.

4. The most important consideration is that cement can only be made where the necessary mineral reserves occur. The proposal identifies such reserves and provides logical extensions to the current operations, within the allocated Area of Search.

5. The development control policies require a wide range of environmental matters to be considered in any planning application. That has been done in the ES and this Regulation 25 Response.

6. In determining applications, planning authorities are required by national policy to give 'great weight' to the benefits of mineral extraction and to proposals that support economic growth. Development proposals should also be sustainable and support the transition to net zero by 2050. This means balancing economic, social and environmental objectives, and taking local circumstances into account to reflect the character, needs and opportunities of each area.

Environmental Effects and Mitigation

7. All environmental effects arising from the scheme, other than carbon, are assessed as acceptable with mitigation. Noise, dust, traffic, ecology, archaeology, and landscape effects were reassessed and refined as part of the Regulation 25 Response. The refined scheme incorporates design changes to reflect this work. In particular, these design changes increase protection for giant redwoods, ridge and furrow, and Anglian Water infrastructure. Biodiversity net gain in excess of 10% will still be delivered, and the new access road will remove HGVs from Ketton and Tinwell villages, though it will add a small amount of traffic to the A606 through Empingham Village. On balance, this is considered to provide a major amenity benefit whilst maintaining nationally important cement supplies.

National and Local Need for Cement

8. Cement remains nationally important because it is essential for housing delivery, green energy infrastructure, and water-industry upgrades.

9. The UK already imports 30% of its cement, and Ketton accounts for 10 –15% of national demand. Without an extension, Ketton would close in around 2032, with its cement production likely replaced by imports. This would leave almost half of the UK's cement demand reliant on international imports.

Socio-Economic Importance

10. The cement works is the area's largest commercial employer and ratepayer, supporting thousands of jobs directly and indirectly. Closure would have long-lasting social and economic impacts that would be difficult to absorb in Rutland's rural economy.

11. Granting permission will secure the continuation of approximately 10-15% of nationally important cement supply up to approximately 2060. It will also secure employment at the Site and in the wider community, which currently is estimated to impact over 3000 people comprising direct, indirect and inferred roles. Furthermore, the Works continued contribution to local government finances, estimated at £1.5–2 million per annum, paid as business rates, represents 3% of the Council's current net budget.

Carbon and Climate Change

12. The original Environmental Statement (ES) considered the effects of the scheme on climate change and identified a likely significant carbon effect. However, the original ES did not include an empirical assessment of carbon emissions. In light of several recent legal rulings, this Regulation 25 Response ('the Reg' 25 Response') now includes an assessment of carbon, confirming that carbon is a likely significant adverse effect.

13. Carbon emissions from cement manufacture arise in two main ways. First is the fuel to heat the kiln, and second is the carbon generated by calcining clay

and limestone. Ketton has already reduced its fossil-fuel reliance (in the kiln) to under 10%.

14. Decarbonising the calcining process is less easy and requires some form of carbon capture and storage (CCS). However, CCS is not yet feasible nor viable at Ketton due to technical and logistical constraints. CCS technology for cement works is only just being rolled out globally, with only two cement CCS plants, one of those being a trial. Heidelberg Materials is at the forefront of this, having the one operational Site (in Norway), one in development (Padeswood in the UK) and several emerging schemes in Europe. As Ketton sits remote from gas storage facilities and other carbon capture clusters, it has challenges to overcome before a carbon capture scheme can be deployed there. For this reason, the Applicant considers it unlikely that such a scheme can be implemented at Ketton until the late 2030s. However, Heidelberg Materials is already implementing its roadmap to net zero and expects to achieve net zero at Ketton by 2050. So far, it has already reduced emissions to 50% of 1990 levels.

15. Ketton's contribution to UK total carbon emissions equates to less than 0.0015%[1]. Even fully abated, decarbonising Ketton would only reduce the UK's emissions by 0.0015%.

16. As carbon is the only significant adverse effect of the scheme, the planning balance needs to consider the scale of that impact against the benefits of the scheme. These include the potential carbon benefit cement brings through its use in building green energy infrastructure, which can't be delivered without cement.

17. Whilst the ES originally suggested a carbon substitution argument (i.e. that imported cement would have a greater carbon effect than Ketton), following the recent West Coast Mining decision, the Applicant now withdraws that and no longer advances such a carbon substitution comparison argument to support its case, due to the lack of available data to accurately assess every possible alternative. It is, nonetheless, true that if Ketton closed in 2032, the UK would have to import cement from abroad to replace Ketton's market share. That imported cement will generate carbon at some level, both at its source and during transportation to the UK. As the world is restricted to just two operational cement CCS plants, those importation sources are likely to generate significant carbon, though a direct comparison for each one, is not practically possible. However, the average for the UK/EU and its trading

[1] Dustscan AQ - Climate change Assessment – Grange Top Quarry Jan 2026 – paragraph 35

partners is reported to be around 870 kgCO2e/tonne[2] for the gross emissions, [3] compared to 705 kgCO2e/tonne generated by Ketton in CEM 1 cement.[4]

18. Whilst cement production generates most carbon, the assessment also considers the lesser carbon emissions sources such as quarrying, road construction, soil movement and transport etc.

Planning Balance

19. Cement is an essential construction product. It is necessary, required and will be used in the UK in any event. If it does not come from Ketton, it will come from somewhere else. The UK cement industry is confined to just 10 cement producing plants, that supply only two thirds of the cement used. The UK is therefore already reliant on importing 30% of its cement. If Ketton closes when its existing reserves run out in 2032, cement imports will increase to 40 - 50%.

20. The development plans (both adopted and emerging) plan for a quarry extension because Ketton cement works is important both nationally and locally. However, in extending the site, the council requested that the scheme reduce highway effects in Ketton and Tinwell villages by shifting site traffic to a new access on the A606.

21. In the longer term, the site will be restored to agriculture and habitat, with the scheme providing biodiversity net gain of at least 10% and significant enhancements to the rights of way network.

22. The environmental statement and Regulation 25 updates demonstrate that there is only one likely significant effect. All other environmental effects are either beneficial, acceptable or adverse but can be made acceptable through the imposition of planning conditions.

23. The scheme will result in a very small increase in traffic passing through Empingham village (4 vehicles per hour), though this is considered insignificant compared with removing approximately 40 HGVs per hour from passing through Tinwell and Ketton villages.

Conclusion

24. The development plan and national policy support this proposed extension to the quarry. Cement is necessary, required and will be used in the UK in any event. This need is inherent in national planning policy, by reference to identified needs for development and by reference to the national significance of minerals, including cement which is identified as nationally important. It therefore follows, that so far as cement remains an important

[2] See Figure 49 in 'Greenhouse gas emission intensities of the steel, fertilisers, aluminium and cement industries in the EU and its main trading partners' https://publications.jrc.ec.europa.eu/repository/handle/JRC134682 and its interpretation in the European Commission 'Default Values for the Transitional Period of the CBAM Between 1 October 2023 and 31 December 2025'.
[3] Dustscan AQ - Climate change Assessment – Grange Top Quarry Jan 2026 – paragraph 38
[4] Dustscan AQ - Climate change Assessment – Grange Top Quarry Jan 2026 – paragraph 101

construction material, there will be cement production. If cement does not come from Ketton, it will come from somewhere else.

25. Cement is fundamental to the public interest, underpinning essential aspects of everyday life and national infrastructure. The UK cannot currently meet its own cement demand and faces the risk of increased imports. This would weaken the economy and expose UK infrastructure plans to the vagaries of international cement market fluctuations. This would also expose the UK to similar risks to those that recently necessitated the government to buy the Redcar steel plant. Maintaining an indigenous supply of an essential material is a material consideration and very much in the public interest.

26. The proposed quarry extension would secure a vital, indigenous supply for another 35 years, supporting thousands of local jobs and safeguarding significant contributions to the local economy through business rates. The strategic importance of the site means the public benefit of maintaining indigenous cement production overwhelmingly supports granting planning permission to secure the UK's construction future.

27. Ketton Works is committed to a robust carbon reduction roadmap, in line with the Climate Change Act 2008, whilst also playing a crucial role in supporting the UK's transition to green infrastructure with the cement it needs.

28. The regulatory framework for cement works ensures ongoing environmental improvements, and any adverse effects are manageable and justifying the granting of permission because of the clear benefits the scheme provides. Simply put, maintaining and extending Ketton Works is essential for economic resilience and granting permission is both pragmatic and necessary.

29. The benefits of the proposal greatly outweigh any negative effects. On balance, this development accords with the development plan and therefore, NPPF paragraph 11 requires that planning permission be granted without delay.

REGULATION 25 RESPONSE

INTRODUCTION

About this document

1. This document relates to planning application reference 2024/0066/MIN, (the Planning Application) at Ketton Cement Works in Rutland.

2. This is a response to a request from Rutland County Council (the Council) for further information under Regulation 25 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, dated 25 June 2025. (Reg' 25 Request) (see Appendix 1).

3. The Applicant is Castle Cement Ltd (the Applicant), Ketton Works, Ketco Avenue, Ketton, Rutland, PE9 3SX. Castle operates as part of Heidelberg Materials UK.

4. The Planning Application is for: -

   Proposed extensions to Grange Top Quarry, for construction and use of a new access and site access road from the A606, a security gatehouse, bridleway bridge and associated works to facilitate the continued supply of minerals to Ketton Cement Works, the consolidation of existing mineral extraction permissions and a restoration scheme to recreate agricultural land and biodiversity enhancement works.

The Cement Market Data Order 2016

5. The planning application for an extension to a cement works is subject to government restrictions relating to the publication of detailed sales and market data.

6. The Competition and Markets Authority (CMA) made an Order under section 138 of the Enterprise Act 2002 concerning the supply or acquisition of aggregates, cement and ready-mix concrete in Great Britain. That Order, amongst other things, prevents the disclosure and publication of cement production and sales volume data relating to the GB cement markets.

7. Castle Cement Ltd (and Heidelberg Materials), as a GB cement producer, is subject to the requirements of the CMA's Cement Market Data Order and is prohibited from publishing cement production and sales volumes that are less than five years old. This also includes any information from which production and sales volumes could be calculated. The company is also obliged under the Order to take steps to protect any onward disclosure of such information by any person to whom it has disclosed such data.

8. However, some statutory processes require the disclosure of that information to government bodies, and it remains incumbent upon them to manage such data in a manner that is compliant with the Order.

9. The planning system requires an assessment of the effects of the proposed development, which can include assessments relating to site output and reserves. With the Order in mind, it is confirmed that the figures used in the planning application are not based on actual sales data from the last five years and are instead based on estimated reserves, outputs and worst-case figures. Actual sales and market share are likely to vary across the life of the site, but the figures used are considered to represent a sufficiently accurate data source upon which to base these worst-case assessments.

10. It remains the case that the county council is in possession of output data that can corroborate the reliability of the figures used in the application in a way that complies with the Order.

Regulation 25 – Further Information and Updates

11. The Reg' 25 Request covers the following matters: -

- Additional noise surveys in accordance with the Public Protection consultation comments. This includes an updated dust management plan and noise and air quality reports.
- Submission of a Road Safety Audit Stage 1 in accordance with the Highway Authority's consultation comments.
- Updated carbon Assessment to take into account the UK Supreme Court in Finch v Surrey County Council.
- Updated plans to take into account the changes required following discussions with Anglian Water relating to their underground assets.
- Updated plans to take into account the retention of the redwood trees in Field 14.

Other Information and Updates

12. In preparing the response to the Reg' 25 Request, the Applicant has also addressed several other matters that arose during the public consultation stage of the planning application. Those matters are not specifically listed in the Reg' 25 Request but are addressed here for completeness: -

- Need for Cement and Socio-economic Importance.
- Highways – points of clarification.
- Archaeology – paleo archaeology written scheme of investigation.
- Public Rights of Way – revisions to delivery.
- Ecological update and draft CEMP.
- Effect of changes to the NPPF Dec 2024.
- Material Assets – Shacklewell Lodge/Wytchley cottages.
- Planning balance update.

Obtaining a Hard Copy of the Regulation 25 Response

13. All of the documents submitted to the Council in response to the Reg' 25 Request are available on the Rutland County Council planning application portal.

14. Hard copies of the Reg' 25 Response can be provided, so long as copies are available, subject to a charge for hard copy documents, which in this case is £500. Electronic versions are available free of charge on line from the county councils planning portal.

15. Requests for a printed copy of this submission should be made to Landesign, ian@landesignuk.com.

Existing Planning Application and Environmental Statement

16. The Applicant submitted its planning application in January 2024. It was accompanied by an Environmental Statement and associated documents investigating the likely significant effects of the proposed quarry extension.

17. These documents can be viewed on the Council's planning application website:

    https://publicaccess.rutland.gov.uk/online-applications/applicationDetails.do?keyVal=S7EZ72NNIKG00&activeTab=summary

REGULATION 25 REQUEST - FURTHER INFORMATION AND UPDATES

18. This section addresses the matters set out in the Reg' 25 Request letter:

- Noise.
- Dust.
- Highways/ Roads Safety Audit stage 1
- Climate Change (including carbon).
- Amendments to plans to address Anglian Water Assets.
- Amendments to plans to retain Giant Redwood Trees in Field 14.

Noise

19. WBM prepared a noise assessment for the proposed extensions to Grange Top Quarry at Ketton in Rutland, dated 15 June 2023. Rutland County Council Environmental Health provided a response (added to the Planning Portal on 15 February 2024) requesting clarification of certain matters, notably regarding the background noise levels.

20. WBM prepared a Technical Note to address the requirements of the response from Rutland County Council Environmental Health. That Technical Note is now submitted to the council. The noise issues are summarised as follows: -

Noise Monitoring and Control

- The EHO agrees with existing monitoring locations and limits (Table 7) but request: -
- Details of periodic monitoring and procedures for complaint-triggered checks.
- 360° photos of sound level meters during background monitoring.
- Require additional sound monitoring at Shacklewell Lodge and Barns, Stamford Road, Empingham.
- Monitoring must occur under:
  - Low wind speeds (<2 m/s) and favourable conditions away from trees.
  - Conducted during typical operating hours for accuracy.
- Need a robust, periodic noise monitoring programme plus a reactive complaint procedure.

Further Assessment

21. WBM suggested continuous attended sample measurements at two locations over the period 10:00 to 14:00. This time period was chosen to avoid the higher traffic flows during commuting times and to represent the typically quieter periods of the day. The survey was undertaken on Wednesday 31 July 2024.

22. As required, the survey was undertaken when there was a forecast indicating wind speeds of no more than 2 m/s. Wind speeds were taken regularly throughout the measurement period using a hand-held anemometer.

23. Permission was granted to measure at Shacklewell Barns within the grounds of the property, i.e. at a location away from foliage closer to the dwellings themselves. Two sound level meters were used at this location to allow for the comparison of 15 minute and 1 hour duration measurements.

24. The second location was chosen to be to the west of the property signed as Shacklewell House. The location was closer to trees than the first location, but was placed in a field entrance as far away from trees as possible between Shacklewell House and the next property on the A606. A location closer to the property at Shacklewell House was rejected due to some works taking place on the property, to reduce the potential influence on measured sound levels of those works. These measurements were of 15 minutes in duration.

25. The wind speeds measured throughout the survey varied between 0 and 1.5 m/s with the occasional short gust of up to 2-3 m/s.

26. It should also be noted that signage at the junction of the A1 leading to the A606 stated that there was no through traffic to Melton Mowbray and Nottingham and that there was a diversion in place. As such, it is possible that the traffic flows on the A606 were reduced from those normally expected.

Updated Noise Survey

27. The results from the installed sound level meter used to obtain background sound level data in 2022 are summarised in Table 6 of the WBM noise assessment dated 15 June 2023. The following average values were presented, based on the operational hours of the quarry, Monday to Friday 0700 – 1800 and Saturday 0700 – 1300:

- 62 dB LAeq,15min
- 46 dB LA90,15min

28. The measured background (LA90) sound levels at Shacklewell Barns were similar to those measured by the sound level meter installed in the vicinity of this location in July 2022, with the measured levels at Shacklewell House being slightly higher.

29. The data validates the 2022 monitoring approach, data and the suggested site noise limit for those dwellings of 55 dB LAeq, 1-hour free field in line with the advice in Planning Practice Guidance (Minerals).

Mitigation - Periodic Noise Monitoring Programme/Reactive Procedure for Complaints

30. WBM suggest a periodic monitoring scheme be incorporated as part of a conditioned Noise Management Plan for the Site (including noise complaint procedures). Site noise monitoring should take place either every six months or annually (or when new areas/phases are started) at the nearest noise-sensitive locations to the activity area to be monitored with listening tests at the other locations identified in the noise assessment report.

Noise Summary

31. The data from the noise survey update has validated the data presented in the original noise assessment submitted as part of the ES and the suggested site noise limit for those properties remains appropriate, based on the latest Government advice relating to noise from mineral sites contained within Planning Practice Guidance (Minerals).

DUST

Dust Management Plan

32. As part of the ES, air quality and dust assessments were provided and included a dust management plan. The ES found that provided appropriate mitigation was employed, there should be no unacceptable impacts from dust.

33. The Environmental Health Officer's response to consultation identified the following matters to be addressed.

Dust Management Plan Requirements

- Routine dust monitoring.
- Specify dust control equipment.
- Define staff training, roles, and responsibilities.
- Complaints procedure/ logging system.
- Wheel-wash facilities if quarry (as opposed to cement works) traffic is likely to enter onto the public highway.

Monitoring and Control

- Install automatic Total Suspended Particulate (TSP) monitors:
- Track PM_{10} levels, wind speed, direction, rainfall, and humidity.
- Identify monitoring locations.

Transparency and Oversight

- Dust Management Plan to be reviewed to reflect changes in the operations as phases progress.
- Dust incidents to be recorded.
- Report incidents through the liaison group for transparency.

Replacement Dust Management Plan

34. The Dust Management Plan submitted in the original ES has now been updated and replaced with the revised Dust Management Plan – October 2025 (the DMP) as prepared by Dustscan AQ which addresses the above points.

35. The DMP relies on standard operational practices for dust control as follows: -

Table 1 - Dust Minimisation Scheme

Dust Minimisation Scheme	
1) The principal activities that may give rise to dust are: -	
a	Soil stripping:
b	Traffic on internal haul roads;
c	Blasting;
d	Loading of limestone onto quarry vehicles.
e	Extraction of clay
2) In order to minimise any dust created by these activities, some or all of the following steps will be taken as appropriate: -	
a	Tarmac surfaced roads to be regularly swept.
b	All spillages to be removed without delay
c	All haul roads within the Site to be watered as necessary to control dust from internal traffic movements (1-2 each hour during dry conditions), either by water bowser or fixed spray system.
d	Water bowser to be available for use on Site at all times.
e	Prevailing meteorological conditions to be monitored.
f	Volume of water applied to road surfaces to be monitored and adjusted according to weather conditions.
g	Any dry, exposed material to be watered as necessary in dry and windy conditions.
NPPF	Drilling rig to be fitted with efficient dust control measures.
i	Haul roads to be compacted, graded and maintained.

36. The Applicant has been monitoring its dust levels at Ketton, for over 20 years as part of its current operations. If planning permission is granted for this application, the revised dust management plan will be employed and result in updated equipment and monitoring locations to reflect the quarry extension and receptors affected. Figure 1 below (Figures 4.3 and 4.4 from the DMP) show the proposed monitoring locations.

37. In addition to the existing dust monitoring gauges used on Site, it is proposed to install more modern, automated monitors that collect a wider range of data and have the ability to provide real-time analysis. As well as traditional fugitive dust, they will also monitor PM_{10} levels and issue an automated alert level of $190_{\mu g}/m^3$ over a 1-hour interval based on practice guidance for the construction industry.

38. Weather data will also be collected to assist interpretation.

39. A complaints log will also be maintained and reported to RCC at agreed intervals.

40. It is intended that the DMP be attached to a planning condition, should permission be granted, to ensure it remains enforceable.

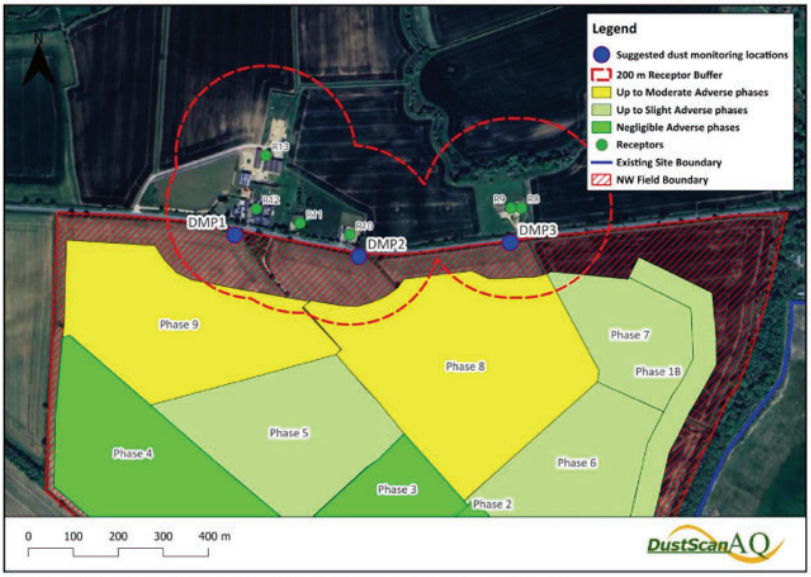


Figure 4.3: Suggested dust monitoring locations for the NW Field

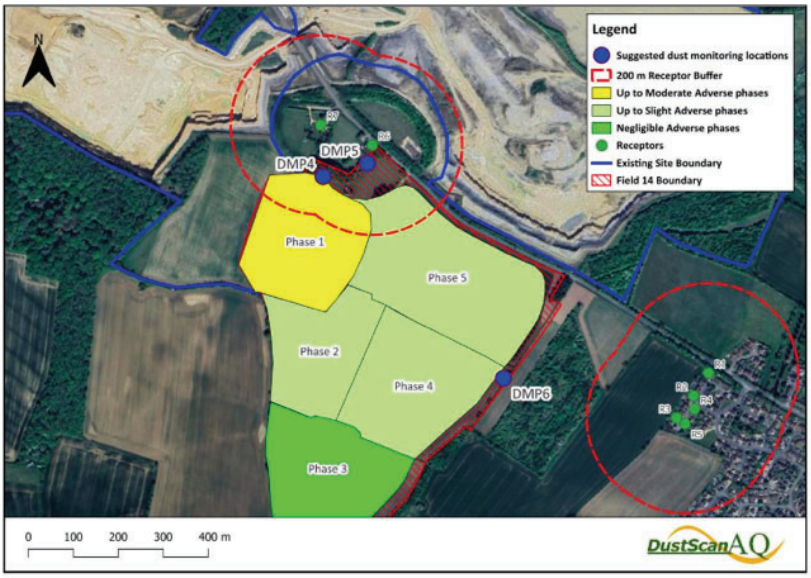


Figure 4.4: Suggested dust monitoring locations for Field 14

Figure 1 - Extract from DMP showing proposed monitoring locations.

Highways & Road Safety Audit Stage 1.

41. The statutory consultees for highway matters all responded that the proposed new access arrangements are acceptable. However, the highway authority did request that a Road Safety Audit Stage 1 (RSA1) be undertaken. In addition, several responses from the public referred to highway concerns, particularly regarding increased traffic passing through Empingham village along the A606.

42. Heidelberg Materials appointed Tetra Tech to prepare a Technical Note to review and respond to various consultation responses, as well as to prepare the RSA1. The full Tetra Tech response is submitted as part of this Reg' 25 Response.

43. The following bullet points summarise the Technical Note. The Technical Note should be read in conjunction with the Transport Assessment that formed part of the original ES.

- References in the original Transport Assessment to its Appendices have been considered and reviewed due to a referencing error in the original document. In particular, the vehicle tracking drawing referred to in ES Transport Assessment Appendix E is now attached to the Technical Note.
- The proposals will not generate any additional traffic on the road network.
- The existing (and future) distribution of HGVs suggests that 5% of HGVs travel west through Empingham, which equates to approximately four two-HGV movements per hour. The remaining HGVs travel onto the strategic road network to the A1. This removes circa 40 HGVs per hour (peak hours) from the A6121 through Ketton and Tinwell villages.
- The majority of HGVs travel to the east on the A606 to the A1. There is a modest increase in HGV vehicle movements to the east on the A606 Stamford Road; however, the impact is not considered to be severe. There is no increase in HGV movements using the A1 and consequently, National Highways have raised no objections.
- Rutland County Council's Highways Development Control team requested a Stage 1 Road Safety Audit of the proposed site access roundabout onto the A606. The appropriate road safety reports were undertaken in accordance with GG119 of the Design Manual for Roads and Bridges (DMRB). The Council's highways team subsequently confirmed that there are no further objections in terms of highway safety or amenity associated with the proposed site access.

44. The Tetra Tech Technical Note concludes that the proposed extension to Grange Top Quarry, in particular the effects of the proposed access, is in accordance with relevant policy and design guidance with regard to highway matters and acceptable in transport terms.

Climate Change Assessment

45. Since the planning application was made, there have been several legal cases considering how to assess carbon and climate change, in environmental statements.

46. One consultee has specifically referred to the court decisions in Finch v Surrey County Council and *Friends of the Earth Ltd v Secretary of State for Levelling Up, Housing and Communities & Ors [2024]*. We can confirm that this and other similar cases, have been taken into account in the Reg' 25 Response.

47. The original ES did not quantify the carbon generated from the project but accepted that a significant adverse carbon effect was likely. The Reg' 25 Response now includes a climate change assessment prepared by Dustscan AQ. The Dustscan AQ report quantifies the amount of carbon that the project will generate.

48. The proposed development will generate significant carbon emissions, and if the quarry is not extended, Ketton's market share will likely be replaced by imported cement. The original ES alluded to a substitution case, i.e. that imported cement could have a worse carbon effect than that of the proposal, not least because imports would not only have to be manufactured, but would also need to be transported to the UK. However, the recent West Coast Mining case concluded that to make such a substitution case in an EIA/ES requires all of the possible substitution alternatives to be assessed. With several thousand cement works in the world, and so many potential supply options, and reporting restrictions (such as the CMA Order – see above) such an assessment is not a practical proposition. In light of the West Coast Mining case, this Reg'25 Response confirms that the ES no longer advances a substitution argument in relation to the 'do-nothing' carbon effect of the scheme. This does not alter the fact that imported cement will generate carbon, as will the transportation of it, but an accurate comparison of emissions is not possible due to the lack of confirmed data. Generally average figures are available - the average for the UK/EU and its trading partners is reported to be around 870 kgCO2e/tonne[5] for the gross emissions, [6] compared to 705 kgCO2e/tonne generated by Ketton in CEM 1 cement[7]. It can therefore be seen that Ketton is better than the average for the UK/EU even if comparisons between specific sites are not possible.

49. However, Ketton Works remains one of the best-performing UK cement works with regard to carbon emissions, as its carbon emissions per tonne of cement are lower than the UK industry average.

50. If Ketton Works closes in 2032, its market share will be replaced by imported cement, which, as stated above, will carry some level of carbon impact. With there being only one operational CCS scheme, and one trial, in the world, in the short to medium term, imported cement will have a similarly high carbon effect, though we cannot be precise how much. Both the do-something and do-nothing scenarios will therefore generate carbon. The nature of the effect is likely to change over time and at Ketton, Heidelberg Materials intends to achieve net zero by 2050.

[5] See Figure 49 in 'Greenhouse gas emission intensities of the steel, fertilisers, aluminium and cement industries in the EU and its main trading partners' https://publications.jrc.ec.europa.eu/repository/handle/JRC134682 and its interpretation in the European Commission 'Default Values for the Transitional Period of the CBAM Between 1 October 2023 and 31 December 2025'.
[6] Dustscan AQ - Climate change Assessment – Grange Top Quarry Jan 2026 – paragraph 38
[7] Dustscan AQ - Climate change Assessment – Grange Top Quarry Jan 2026 – paragraph 101

51. The Dustscan carbon assessment assumes a worst-case scenario where current levels of emissions do not change over the life of the project. This is a worst-case scenario, as a CCS is anticipated to be brought online at Ketton in due course (potentially the late 2030s). The Dustscan assessment has had to disregard that possibility as, at present, there is no definitive CCS scheme to which the assessment can refer. In practice, Heidelberg Materials expects to emit much less carbon than the Dustscan report indicates, by continuing to implement its carbon roadmap, which has so far reduced carbon at Ketton by 50%, compared with 1990 levels.

52. The planning balance will therefore need to consider whether to support the UK cement industry and maintain local jobs despite the carbon emissions, or refuse permission, resulting in job losses and increased reliance on imported cement with offshore carbon impacts beyond UK control.

53. As with the original ES, the conclusion remains that the effects of cement making are significant in terms of carbon generation, although mitigation programs are being implemented by the Applicant, reducing these effects as it adapts its business to net zero by 2050.

Heidelberg Materials Carbon Reduction Roadmap

54. Heidelberg Materials is seeking to reduce carbon in several ways, though CCS remains the largest single carbon reduction method. Other programs focus on changing the fuels, blending clinker with low carbon materials and improving energy efficiency across the business.

55. Carbon capture and storage (CCS) for cement production is an emerging technology, with challenges in carbon storage, transport, and capture. Globally, only one full-scale CCS project exists, operated by Heidelberg Materials, and a smaller trial operates in China.

56. Heidelberg Materials is embarking on the UKs first cement CCS at Padeswood, at a cost of £400 million. Such an investment can only be justified at sites with large mineral reserves.

57. The challenge also lies in aligning UK and international policies, driving the construction industry to use more expensive, low-carbon cement. Those policies are not yet in place. Therefore, investing in an expensive process, to produce expensive cement, that nobody is obliged to buy, makes CCS a difficult prospect to achieve viably at the moment.

58. As will be apparent, the above uncertainties mean that the UK cement industry is only at the stage of preparing to trial the effectiveness of CCS in the UK. This will result in a refining of its approach before rolling out the solutions across the wider industry. Similar trials are being pursued by other companies e.g. Peak Cluster (https://peakcluster.co.uk) and near the Humber (https://nephccp.co.uk). All of these schemes rely on existing clusters of CO_2 emitting industries, linking pooling their resources to decarbonise and sharing facilities to sequester carbon.

59. Ketton is more challenging, as there are no other carbon emitters nearby, and no local carbon storage facility to use.

Brevik CCS

60. Brevik CCS is Heidelberg Materials' most advanced CCS project and is part of the Norwegian government's Longship programme, which aims to demonstrate the capture, transport and safe storage of CO_2 from industrial sources.

61. In 2025, Heidelberg Materials started producing and supplying evoZero, the world's first CCS cement, enabling net-zero concrete without compromising on strength and quality.

Padeswood CCS

62. Heidelberg Materials UK is also building the UK's first CCS facility at its Padeswood Site in North Wales. It will capture around 800,000 tonnes of CO_2 a year. It will link with other local businesses (the HyNet industrial cluster) and send captured carbon, via pipe, for permanent storage into exhausted gas fields in Liverpool Bay.

63. Permission for the CCS scheme has been granted, development work commenced in 2025 and is expected to be operational in 2029.

Other CCS Projects

64. Heidelberg Materials has, in November 2025, secured funding for four additional EU Innovation Fund grants to drive decarbonisation projects in mainland Europe at: -

- Anthemis in Belgium,
- Airvault GO CO_2 in France,
- DREAM in Italy, and
- HuCCSar in Poland.

Calcined Clay Project

65. In a joint venture, Heidelberg Materials and CBI Ghana Ltd have completed the construction of the largest industrial-scale flash calciner for clay worldwide. The installation has a capacity of more than 400,000 tonnes of calcined clay per year. First batches of calcined clay cement with reduced clinker content have already been delivered to customers.

66. Calcined clay can be used to reduce the proportion of traditional clinker in cement. Since CO_2 emissions from clay calcination are significantly lower than emissions from clinker production, substituting clinker with calcined clays will significantly reduce the amount of CO_2 for each tonne of cement.

Heidelberg Decarbonisation Summary

67. Heidelberg Materials aims to achieve Net Zero and is leading the global cement industry in driving down carbon emissions. The scale of this undertaking

cannot be underestimated in terms of both the technological innovation and the capital required to deliver these schemes.

68. The expectation is that as these trials are proven, the global industry will learn and benefit from them. This should then lead to the wider rollout of these approaches and the synergies linking to new storage facilities and infrastructure that are being developed.

69. However, it is also equally clear that the industry is in the early stages of this program, and the technologies are not yet freely and easily available to roll out immediately. Hence, the reason this application cannot include a CCS scheme at this stage.

Climate Change Summary.

70. The proposed development will generate carbon. The Carbon assessment[8] indicates that for CEM I cement, this is 705 kgCO_2e/tonne. Unabated, it will amount to 0.0015%[9] of UK total emissions, however, the biggest carbon emitters in the UK, are the domestic and transport sectors, which account for over 50%[10] of total emissions. The UK's shift to green energy aims to make significant reductions in these areas through the rollout of renewable energy, electric vehicles and nuclear power, but it needs lots of cement to do it. Therefore, there is a trade-off between delivering green energy infrastructure quickly, versus the carbon effects of the materials used to build it. Is it reasonable to accept a 0.0015% carbon impact if it enables significant cuts in domestic, transport, and commercial emissions that account for over 50%?

71. Heidelberg Materials carbon reduction roadmap is well established and being actively implemented already. Adjustments to government policy, to both make low carbon cement competitive and level the commercial playing field against imported cement, remain necessary to underpin major investment in low-carbon technology, such as CCS. Whilst the construction industry is free to use unabated cement, low-carbon cement will struggle in the market. Such governmental changes are starting, the Padeswood scheme being a government supported initiative, but no such government scheme exists at Ketton.

Updated Design Plans

72. The work undertaken to address the Reg' 25 Request resulted in several changes to the scheme design. The changes, though small, affect many of the plans submitted with the planning application. Therefore, the Applicant is now replacing the affected plans with updated ones that show the revised design. The sections below explain the details behind the changes, though in summary the changes are as follows: -.

[8] Dustscan - Climate Change Assessment – Grange Top Quarry - Jan 2026 – Paragraph 101
[9] Dustscan AQ - Climate change Assessment – Grange Top Quarry Jan 2026 – paragraph 35
[10] Dustscan - Climate Change Assessment – Grange Top Quarry - Jan 2026 – Table 4.25

- North West Land (NW Land) - realignment of the limit of extraction on the northern limit of NW Land, in the vicinity of Shacklewell Lodge, to move some section of it further south, to provide a wider stand off to an underground water pipe operated by Anglia Water.
- Field 14 - realignment of the limit of extraction and screening bund on the eastern side of Field 14, in the vicinity of Paradise Field (south of Wytchley Cottages), to retain a number of Giant Redwood Trees and preserve an area of ridge and furrow field.

Design Change - NW Land - Anglian Water

73. Anglian Water (AW) responded to the planning application consultation, highlighting concerns regarding the potential effects of the scheme on the integrity of a nearby AW water main. The water main runs at significant depth, just inside the application boundary, alongside the southern side of the A606 road. This water main provides top up water to Rutland Water.

74. The water main sits well below the lowest point of the quarry and is constructed in the Lias clay. The Lias Clay is the strata that sits below the Lincolnshire Limestone. The water main, therefore, sits well below the depth of the proposed mineral extraction and is also offset to the north of the extraction area. There is therefore no chance of mineral excavation directly damaging the main, as the two are already well separated both vertically and horizontally.

75. AW's main concerns, therefore, arose principally as a result of the potential for indirect effects on the water main structure, which is a large-diameter concrete sectioned tunnel. The concerns were twofold: -

- Reducing ground pressure during tunnel construction may affect tunnel stability, as the compressive weight of the surrounding ground helps maintain the tunnel's integrity. The weight of the surrounding strata contributes to the tunnel's ability to retain its shape.
- Potential ground movement effects on the tunnel, e.g. from blast vibration.

<u>Geotechnical Investigation</u>

76. The Applicant and AW worked with an independent engineering consultant to investigate the various geotechnical parameters until AW was satisfied that its water main would be satisfactorily protected.

77. Following the investigation, the Applicant agreed to set the extraction limit on NW Land at least 45m south of the water main alignment. This stand-off distance is based on geotechnical studies and includes an added margin for safety. This stand-off, therefore, moved the quarry face further away from the water main and secondly, ensured that the ground pressure overlying the pipe remains at a safe level to maintain the integrity of the pipe.

Rutland Water

78. Several third-party consultees claimed there would be effects on AW's Rutland Water reservoir and its dam. AW did not make any such comments in its consultation response.

79. This created an unusual circumstance in which third parties were making representations, apparently regarding AW's interests, despite the fact that AW did not actually agree with the points being made. The Applicant engaged directly with AW to ascertain whether these third-party comments accurately reflected AW's position. AW confirmed that its comprehensive feedback was provided in its response to the Council, and it does not share any concerns regarding potential impacts on Rutland Water. This conclusion is logical, given the separation distance between the quarry and Rutland Water. Field 14 is over 3km from Rutland Water and NW Land is over 1km away.

Anglian Water - Withdrawal of Objection

80. As a result of the aforementioned work, AW withdrew its objection to the planning application (see Appendix 4). The withdrawal depends on the development adhering to the revised NW Land extraction limit and maintaining ground vibration (from blasting) to below 25mm PPV at any point on the ground surface (as opposed to on the pipe surface) directly above the water main. The location of the monitoring point will change over time as blasting operations approach the water main during phases 7 to 9. This point is meant to represent the shortest distance between the pipe and the current working face.

81. The figures below demonstrate the changes between the original (Figure 2) and revised (Figure 3) limits of extraction.

Figure 2 - NW Land original proposed limit of extraction.

Figure 3 - NW Land Reg' 25 revised limits of extraction now proposed in phases 7, 8 and 9.

Design Change - Field 14. - Paradise Field, Wytchley Cottages and Wytchley House

82. Paradise Field sits immediately south of Wytchley Warren Cottages, on Empingham Road, Ketton. It comprises a paddock of ridge and furrow land surrounded by mature, but narrow woodland strips, contains two small islands of trees and two old fruit trees (in poor condition). (See Figures 3 and 4)

83. The original proposal excavated the southern half of Paradise Field and installed a 3m high amenity bund over much of the rest. This removed most of the ridge and furrow, the Giant Redwoods and both fruit trees.

84. Residents from Wytchley Warren Cottages made representations regarding the proximity of the Field 14 proposals to their properties with Paradise Field being closest to them.

85. A further representation was also made regarding the potential direct effects on Paradise Field, in particular: -

- Loss of ridge and furrow land.
- Loss of several giant redwood trees.
- Loss of two older fruit trees.

Changes to Paradise Field.

86. Following discussions with the Council and members of the local community, it was established that there was a desire to retain part of all three aspects i.e. ridge and furrow, giant redwoods and the fruit trees.

87. Extending the quarry into Field 14 requires passing through a narrow area, in its northeast corner (at Paradise Field), further complicated by deep clay and limestone. As a result, the access road must be excavated 20-30 metres below the current surface. There will be a need to construct stable side batters for that access, from the surface, down to the haul road level, which means that only so much of Paradise Field can be retained before safe access into Field 14 is compromised. Nonetheless, the proposal has been reviewed at Paradise Field to establish what features might be saved.

88. The review resulted in a realignment of the extraction limit and the repositioning of the proposed screening bund. The screening bund remains necessary to protect Wytchley Warren Cottages and Wytchley House from the proposed operations, so it has been repositioned.

89. As a consequence of the above, the following changes have been made.

- The limit of excavation has been pulled back around Paradise Field and on the northwestern limit of Field 14 Phase 5.
- A grove of Giant Redwoods will be retained on the northwestern limit of Field 14, phase 5.
- The screening bund in Paradise Field has been realigned to now sit south east of the retained grove of Redwoods.
- A larger area of ridge and furrow has now been retained between the grove of Redwoods and Wytchley Warren Cottages.
- Separately, Heidelberg Materials also agreed to plant more Giant Redwoods in Field 13 (south of the Windmill), and this was done in winter 2025, with community involvement.

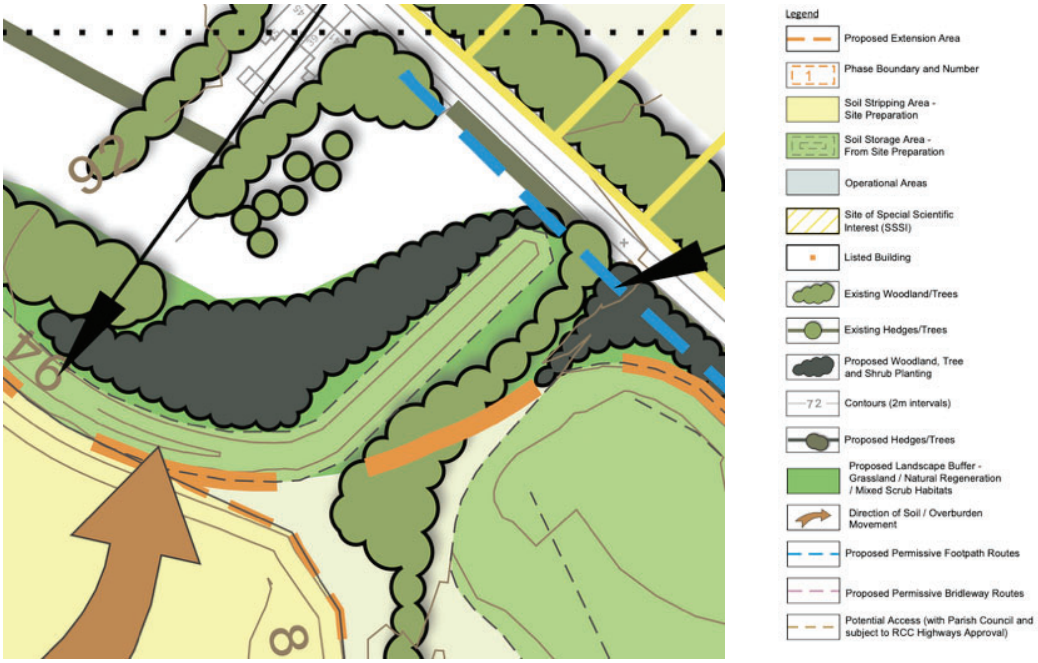


Figure 4 - Original Layout for Paradise Field

Figure 5 - Revised Layout for Paradise Field

90. In the original design (Figure 4), the bund sat in Paradise Field with new woodland planting (shown in dark green) covering the ridge and furrow between the bund and Wytchley Warren Cottages. The original limit of extraction (dashed orange on Figure 4) cut across the Southern corner of Paradise Field. Most of the Giant Redwoods were to be removed under that extraction limit.

91. The new limit of mineral extraction (Figure 5) (dashed orange) has been pulled southwards in Paradise Field (compare with Figure 4). Scattered planting (aligned NW-SE) along the northern edge of the realigned bund and extraction will screen the workings from Wytchley Warren Cottages and Empingham Road. The proposed soil storage area has moved to the SE of the linear woodland containing the Giant Redwoods. This will retain more of the Giant Redwoods.

92. The consequences of these modifications impact most of the design plans from the original submission. Accordingly, revised design plans are included with this Regulation 25 Response. The updated plan list at the start of this document shows which plans are being replaced. Plans highlighted in green in the updated plan list are the replacement submissions, whilst those indicated in red and strikethrough are superseded.

OTHER INFORMATION AND UPDATES

93. This section provides updates on matters not specifically mentioned in the Reg' 25 Request but are matters raised during public consultation: -

- Need for Cement, Socio-economic Importance and Economic policy.
- Archaeology – Paleo archaeology.
- Public Rights of Way Revisions and Delivery.
- Ecological Update.
- Construction Ecological Management Plan (CEMP).
- Effect of changes to the NPPF Dec 2024.
- Material Assets.
- Further Mitigation Measures.

Need for Cement.

Background

94. After air, water and food, cement/concrete is one of the most important materials in the modern world. Most people take for granted their surroundings but without concrete, those surroundings would not exist, and cement is an essential ingredient in concrete. No other construction material has such a wide range of applications, requires little maintenance, and even absorbs carbon dioxide from the air. And when concrete structures become redundant, they can be easily recycled. Most importantly of all, it is widely available.

95. All of these properties give us a world with strong and reliable buildings, flat roads, safe transport, new houses, schools, hospitals and workplaces, that are all resilient to natural forces and don't decay or burn, like the less resilient construction materials such as wood.

96. A drawback of cement/concrete is that making it is capital-intensive. This is why in the UK, the industry has been reduced to just ten active cement works to support the entire UK construction sector. Ketton is one of the largest of those ten.

97. The UK drive to transition from fossil fuels to green energy; to provide sufficient housing; and improve water treatment to clean our rivers, all assume there will be a steady and adequate supply of cement, that is readily available. Without that steady and adequate supply, these infrastructure goals cannot be delivered. As things stand, the UK is only currently delivering two-thirds of its cement needs. The planning system is, therefore, already failing in its obligation to deliver a steady and adequate supply, indigenously. Indeed, one third of cement supply is already reliant on imports and if Ketton were to close, that would increase closer to half. At the very least, this would be likely to increase UK construction costs and may even result in some projects becoming unviable.

98. This is why the NPPF reminds us that it is 'essential' that there is a sufficient supply of minerals to provide for the infrastructure, buildings, energy and goods that the country needs.

99. Put simply, the UK cement industry has little spare capacity to meet existing demand. The benefit to the UK to keep Ketton Works active beyond 2032 is clear and stark. Securing the long-term future for Ketton Cement Works is therefore very much in the public interest.

UK Cement Market

Size of the industry

100. In 2025, UK cement production dropped to its lowest point since 1950, yet the industry was only able to meet 65% of that suppressed level of demand. However, national policies are heading the other way and are pursuing a step change in construction delivery, notably 1.5 million new homes and extensive, new, green energy facilities. The water industry is under pressure to improve its infrastructure to prevent sewage overflows into rivers and lakes. These goals all necessitate building something, and that something, almost always needs cement. Improving cement supply is, therefore, essential to delivering these aims. The demand generated by these upcoming projects makes this clear. For example, up to 750,000 tonnes of cement could be required for Sizewell C and nearly 8,000 tonnes is required for a typical new hospital, while 3–5 tonnes are needed to construct a traditional four-bedroom family house. The public interest, therefore, demands vast quantities of cement now.

101. In 2024, the UK made only 7.3 million tonnes of cement, around half of what it produced in 1990. Cement imports have nearly tripled over the past 20 years, rising to 32% in 2024. Of the 11.082 million tonnes of cement sales in the UK in 2023,[11] domestically produced sales supplying about two thirds [12].

102. Since the early 20th century, the UK cement works have reduced from 200-300 Portland Cement works[13] to just ten, operated by just six companies. (There are some other smaller cement alternatives, though these make up a very small part of the market).

103. Of the ten UK cement Works, several sit in or close to national parks/national landscapes where planning policy does not support major industry. The future for the UK cement industry is, therefore, in a precarious position as it is by no means certain that these ten plants can remain in production indefinitely.

[11] Mineral Products Association – Annual Cementitious Sales - https://cement.mineralproducts.org/MPACement/media/Cement/Industry-Statistics/2025/2025-08-14_Annual_cementitious.pdf
[12] Mineral Products Association – Annual Cementitious Sales - https://cement.mineralproducts.org/MPACement/media/Cement/Industry-Statistics/2025/2025-08-14_Annual_cementitious.pdf
[13] Cementkilns.com https://NPPF.cementkilns.co.uk/plants.html

104. This leaves UK construction supply chains, increasingly exposed to the risks of volatility from international cement markets. Similar issues in energy and steel supply have shown that this can result in increased cost for the UK and its residents.

105. As the Mineral Products Association recently commented: -

> *'Cement quite literally underpins the nation's growth, and we can't deliver new homes, schools, hospitals, transport links or clean energy infrastructure without it. The UK has a choice: to build these vital development projects with UK-made cement, or to build them with imports – sending jobs, investment and economic growth overseas.'*[14]

Socio-Economic Importance of Cement

106. The value of UK sales of cement, including blended cements, is £874 million and provides direct employment for approximately 2,700 people.[15] It is estimated that 15,000 further jobs are supported indirectly. The Applicant supplies approximately one quarter of the UK cement from its three works and import facilities.

Reacting to Market Changes

107. Cement works cannot be turned on and off to suit flexible market conditions. If a kiln is switched off for any length of time, it is often problematic to switch it back on again. Ketton's Kiln 7 is a good example of this. Temporarily closed in the late 2000s, the Kiln has never worked since. Where a cement works does close for an extended period, its market is quickly replaced by imported cement. Once lost, that market is difficult to recover as the scale of investment required is huge. It becomes cheaper to simply import from active cement works abroad. Several UK cement works have been lost over the last decade, corresponding to the increase in imported cement.

Challenges in the Cement Market

108. The UK's cement manufacturers are currently battling some of the highest industrial electricity prices among developed nations and uneven carbon taxation, which means importers – especially those outside of the EU – do not necessarily pay the same costs for their emissions.

Ketton's Role in Cement Supply.

General Position

109. The largest market for Ketton cement sales is the south east of England, including London, with most of Ketton's production going south from the Works, as far as the south coast. The south east market accounts for approximately

[14] Mineral Products Association press release 3 September 2025 https://NPPF.mineralproducts.org/News/2025/release28.aspx

[15] (Source: Cement Manufacturing in the UK - Market Research Report (Updated: March 31, 2023).

one quarter of total UK cement sales, significantly larger than any other region. Supplying the south east is therefore important to the UK economy.

110. Approximately one quarter of Ketton's cement is delivered by rail to its distribution depot at Kings Cross, London. From here, road tankers further distribute it to customers around the capital, mainly for use in ready-mixed concrete. A previous assessment (reported in a planning matter in 2018) suggested that around 50% of all sales from Ketton were consumed within London and the south east of England.

111. Being the closest rail linked cement works to the south east market, makes Ketton a very important source of supply in terms of the national picture.

Previous and Future Major Projects in the SE area.

112. A review of recent and forthcoming major projects, requiring large quantities of Ketton cement, shows just how important cement from Ketton is. Table 2 shows how many important projects there are in the south east, that have, or may use, Ketton cement.

Table 2 - Major Projects Linked to Ketton Cement

Past and Present Project	**Future projects**
HS2	Sizewell Nuclear Station
Thames Tideway	Lower Thames Crossing
Crossrail	Great Grid Upgrade (National Grid)
Google HQ London	HS2 Euston Station and Slab Track Projects (completion of project)
Euston Station (HS2 project)	Heathrow and Gatwick airport extension
Silvertown Tunnel Project	Anglian and Thames Water Reservoirs Projects
Swiss Building London	Data Centre Developments throughout central and southern England
Heron Quays London	Small Modular Reactors
Canary Wharf London	British Library Extension
Walkie Talkie Building, London	Awe Aldermaston
Leadenhall Building London	East to West Rail Developments
Bishops Gate London	Oxford and Cambridge University Development
Royal College of Arts, London	
Oxford University Campus	

113. Notwithstanding these large schemes, many smaller schemes are also important. For example, Heidelberg Materials recently supplied[16] concrete for the landfall electrical connection for the 72 turbine Inch Cape offshore wind farm. This windfarm will deliver enough green energy to power 1.6 million homes from 2027. The volume of cement used was relatively small in this instance, though without it, carbon-free energy for 1.6 million homes could not have been delivered.

[16] Quarry Management Magazine – October 2025 - Page 8

114. As demonstrated by several of these projects, although cement production emits carbon, its use in these initiatives results in a greater overall carbon benefit.

Ketton Works - Economic Importance

115. Ketton Cement Works has operated for over a century. The Works is both nationally important for its cement supply, and locally important for the jobs and business rates, etc, it supports.

Business Rates

116. The Cement Works business rates were £1.7 million for 2025[17] representing nearly 10% of the total business rates collected in the county. Rutland County Council's net budget for 2024/5 was £52 million meaning Ketton's business rates therefore account for 3% of that net budget. This is twice the size of the next largest rates payer in the county.

117. In addition, many employees and suppliers live locally and use part of their earnings to pay council tax and business rates to the Council. The Works, therefore, plays a significant part in the Council's finances.

Direct Economic Effects.

118. Ketton Cement Works' annual (2022) spend on purchased goods and services was estimated to be £140 million. This includes wages, goods, services, and taxation.

119. With a lack of other large employers locally, the operations at Ketton are arguably the most important direct contributor to maintaining high levels of employment and a thriving economy.

Indirect Economic Effects

120. It is not possible to easily allocate the benefit of this £140 million to specific economic sectors, as many suppliers operate across multiple sectors. However, the Works is estimated to provide £51,125 GVA per employee. As a comparison to other sectors, this is lower than the manufacturing industry, information and communication, and the financial and insurance sectors, but higher than government, health, education, defence, professional and support, and other services.

121. The potential indirect employment can be indicated through simply dividing the goods and services used by the Works by the GVA generated. (i.e. £140 million/£51,125). This suggests that 2,738 (no.) employees' jobs further down the supply chain depend, to some degree, on Ketton Cement Works. Whilst this calculation is by no means conclusive, it clearly demonstrates that a lot of

[17] Rutland County council – Business Rates Dataset - https://NPPF.rutland.gov.uk/businesses/business-rates/business-rates-published-data-sets

people, many of them in Rutland, derive their income, in some way, from the existence of the Works.

Induced Effects

122. In the absence of detailed data on the consumption patterns of local employees, an estimate of induced effects is made based on guidance from English Partnerships[18]. This guidance suggests that an uplift figure of 10% could be applied to existing employment figures to identify an induced employment effect. Hence, if the direct employment effect is to retain 240 jobs, and the indirect effect is to retain 2,738 (no.) indirectly affected jobs, then uplifting this total by 10% would provide a reasonable estimate of 298 (no.) jobs for the induced employment benefit.

Overall employment effects

123. The overall local employment significance of Ketton Cement is therefore estimated as 240 (current employees) plus 2,738 (indirect) plus 298 (induced). This would suggest approximately 3,276 jobs are linked in some way to the Works. This is not to suggest that the closure of the Works would lead to the loss of 3000+ jobs, though it does show that if the Works were to close in 2032, the effects would be far-reaching, especially in a community as small as Ketton and Rutland.

Social Effects of Closing Ketton Works

124. Whilst the application seeks to extend the life of the Works, it is equally important to consider what happens if it is allowed to close in 2032.

125. A comparable scenario is the social effects of the closure of the coal mines in the 1980s/90s, where a single large employer dominated a community. A 2022 study, by the Institute for Fiscal Studies, examined the effects of the collapse of the UK coal industry on the communities and miners involved. The conclusion was that the effects were long-lasting. The IFS noted: -

We find evidence of substantial losses: wages fall by 40% and earnings fall by 80% to 90% one year after job loss. The losses are persistent and remain significantly depressed fifteen years later, amounting to present discounted value earnings losses of between four and six times the miners pre-displacement earnings.[19]

126. The report went on and concluded that; -

While specific to the UK context, these findings suggest that the phase out of the coal industry, a policy which has been repeatedly proposed as an alternative to reduce carbon emissions, could impose large costs to coal

[18] English Partnerships in their 'Additionality Guide - Third Edition', dated October 2008

[19] Institute for Fiscal Studies - 22/37 Working Paper - Job displacement costs of phasing out coal – Abstract - https://ifs.org.uk/sites/default/files/2022-09/Job%20displacement%20costs%20of%20phasing%20out%20coal.pdf

miners, their families and mining communities that may persist in the long run.[20]

Socio-Economic Effects Summary

127. Ketton Cement Works provides approximately 10-15% of the UK cement supply, being particularly important to the London and south-east areas. The Works plays an important part in the regional and national economies.

128. It is a major influence on the local economy through the goods and services it uses, and the jobs it supports, as it is the largest corporate employer in the county.

129. Ketton Works is the largest employer in the county. If the Works was to close in 2032, it is far from clear where that size of workforce could find alternative employment in the county. Extending the life of the Site to approximately 2060 will secure the circa 3,000 associated jobs.

130. Conversely, should the planning authority be minded to refuse planning permission to extend the quarry, it must properly consider the likely significant adverse socio economic impacts that accompany that decision as they are likely to be both significant and long lasting.

Economic Policy

131. The NPPF[21] chapter 6, confirms decisions should help create the conditions in which businesses can invest, expand and adapt. Significant weight should be placed on the need to support economic growth and productivity, taking into account both local business needs and wider opportunities for development.[22]

132. The NPPF requires sustainable growth and expansion of all types of business in rural areas and the diversification of agricultural and other land-based rural businesses.[23]

133. The development plan (policies CS13 MCS Policy 4) all encourage the continuation of operations at Ketton works.

134. The ES and Reg 25 Response show that the proposed development has only one significant adverse effect, yet multiple significant economic benefits. The NPPF emphasises that both 'significant weight' should be given to supporting economic growth, and 'great weight' should be given to the benefits of mineral extraction.

135. NPPF Section 17 confirms that: -

[20] Institute for Fiscal Studies - 22/37 Working Paper - Job displacement costs of phasing out coal – IV Final Remarks – pp15/16 - https://ifs.org.uk/sites/default/files/2022-09/Job%20displacement%20costs%20of%20phasing%20out%20coal.pdf
[21] NPPF Paragraph 8.
[22] NPPF paragraph 85 – Building and strong, competitive economy.
[23] NPPF paragraphs 88 – 89 - Supporting a prosperous rural economy.

> *It is essential that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the country needs. Since minerals are a finite natural resource, and can only be worked where they are found, best [24]use needs to be made of them to secure their long-term conservation.*

136. Planning authorities are, therefore, directed to provide policies for the extraction of mineral resources of local and national importance[25], providing they avoid unacceptable adverse impacts.[26]

137. Minerals planning authorities should maintain a steady and adequate supply of industrial minerals and co-operating with neighbouring and more distant authorities to ensure an adequate provision of industrial minerals to support their likely use in industrial and manufacturing processes.[27] As only 10 cement works satisfy the needs of 381 local authority areas, this is particularly relevant in this instance.

138. Maintaining a stock of permitted reserves to support the level of actual and proposed investment required for new or existing plant, and the maintenance and improvement of existing plant and equipment.[28] It sets a minimum stock for cement of 15 years or 25 years to support a new kiln[29]. However, the NPPG casts a wider net, and advises that: -

> *Stocks of permitted reserves should be calculated when a planning application is submitted to extract the mineral (through either a site extension or a new site) or when new capital investment is proposed.*
>
> *The overall amount required should be directly linked to the scale of capital investment to construct and operate the required facility (such as a cement plant or brick factory).[30]*

139. The proposed extension will extend the stock of reserves from 7, to 35 years.

140. Given the significant investment proposed at Ketton— i.e. for the new road, the proposed bridleway bridge and general development of the extensions—a substantial reserve is necessary. The proposed stock exceeds the minimum required by the NPPF and NPPG and follows logical site boundaries to satisfy the development plan policies. The reserve is maximised without compromising amenity policies. This enables a coherent development of the two extension areas and avoids arbitrary 15-year piecemeal extensions. It should be noted that 15 years is the minimum stock that the council should be seeking to permit. There is no upper limit to the stock of reserves.

[24] NPPF paragraph 222.
[25] NPPF paragraph 223 a.
[26] NPPF paragraph 223 f, 224 b, 224 & 224c
[27] NPPF paragraph 227a
[28] NPPF paragraph 227c
[29] NPPF footnote 81
[30] NPPG Minerals - paragraph: 088 Reference ID: 27-088-20140306 Revision date: 06 03 2014

141. In policy terms, there is support for the economic and socio-economic benefits of extending the quarry and life of the Site at all levels of policy.

Need Conclusion

142. In summary, there is a strong economic and socio-economic case for granting planning permission for this development as it will: -

- Secure 10-15% of the national cement supply for a further 25-30 years, at a time when government policy is pressing hard to deliver more homes and a transition from fossil fuel to green energy facilities.
- Reduce the need for increasing volumes of imported cement and avoids forcing the construction sector to become more reliant on international imports to deliver the increased housing and infrastructure the country needs.
- Secure an existing major source of employment/income linked to over 3000 local jobs.
- Secure annual business rates income for the county of £1.5-2 million per annum.

143. The proposed scheme, therefore, has a positive socio-economic effect.

Archaeology – Paleo Archaeology Written Scheme of Investigation.

Geoarchaeology WSI

144. During the consultation process, the County Archaeologist asked for a geo-archaeological assessment of the potential of the extension for the recovery of early prehistoric remains.

145. Subsequently, Phoenix Archaeological Consultants visited the Site during the trenching of Field 14 with Professor Martin Bates for his initial thoughts on such potential.

146. In light of that, Professor Bates has prepared a written scheme of investigation (WSI) for geo-archaeological assessment and investigations as part of a post-determination mitigation strategy.

147. The WSI can be found in Appendix 7 of this Reg' 25 Response. This is intended to form part of a planning condition.

Public Rights of Way – Revisions and Delivery.

148. The RCC public rights of way team queried the proposed new and upgraded rights of way, expressing some reservations, particularly because many new routes start off as permissive rights of way. In particular, the rights of way team noted that.

> *I don't take the provision of permissive routes into account when assessing the overall impact of the proposal on the local rights of way network. They (routes) are temporary in nature as permission can be withdrawn.*

149. With regard to the proposal to upgrade footpath E229, the following was noted:

The section of footpath E229 crossing land within the applicants control should be dedicated as a public bridleway (in perpetuity). This has been a long-term aspiration of both RCC and the local community since the last quarry extension (at least). The section of E229 subject to the temporary diversion granted in 2007 was reinstated/constructed to bridleway standard. Apart from removing the height restrictors either side of the bridge there are no additional works required by the Applicant to bring the route up to the required standard. At the northern point where E229 leaves the applicants land there is an existing grass surfaced track (proposed as a permissive bridleway) that would also need to be dedicated to connect with existing public bridleway E226. As with E229, this route is already in a suitable condition for use as a bridleway meaning there would be virtually no additional works required by the Applicant.

150. With regard to the proposal to temporarily divert bridleway E226, whilst a new quarry haul road bridge and Works access crossing point are installed - the following was noted:

Proposed bridge design is subject to technical approval by LCC structures team. Arrangements for inspections and maintenance will need to be agreed, and do we need to consider now what should happen on restoration of the Site. Will the bridge remain? In which case do we need to discuss a commuted sum? Or will the haul road be backfilled / re-graded, and the bridge removed. It's not really clear from the indicative final restoration plan.

151. Regarding the temporary diversion of bridleway E226 whilst the new structures are built: -

There does not appear to be any indication of the time period over which the temporary diversion is proposed (or have I missed it)? In principle this seems fine so long as the attention is paid to the surface of the route, ensuring its suitable for us as a bridleway in all weathers / at all times of the year.

152. Regarding the temporary diversion of bridleway E226 whilst the new structures are built: -

HGV Crossing - The crossing design would appear to adhere to standards / recognised best practice that seek to minimise risk. However, there will still be some residual risk from introducing motorised traffic to a public right of way. Any proposal increasing risk to users is generally viewed negatively. Overall, I would accept that the gain from dedication of bridleway rights over part of FP E229 (along with the link to E226) would satisfactorily offset the otherwise negative impacts of the proposal.

Reg' 25 Amendments

153. Proposed Public Access Summary plan (ref KE-ROW-REVB) shows the updated Reg' 25 proposals for rights of way.

154. Having considered the above points and reconsidering timescales and connectivity, the Applicant has revised both the delivery timescale and the

extent of many of the proposed routes to address the rights of way officer comments. These are considered below.

Permissive Paths

155. Whilst the PROW officer prefers not to take the provision of permissive paths into account, it is unreasonable to disregard them as they are a benefit and will be used. They were all proposed because in pre application consultation, there was a clear aspiration from members of the community for further public access.

156. The Applicant has to balance its operational concerns with public access, not least to ensure that members of the public are not encouraged to enter operational zones. These operational zones move with time and as works are completed in an area, it becomes easier to formally dedicate permissive routes.

157. Quarry companies take this approach because the legislation for diverting formal rights of way often results in lengthy delays to resolve such matters, as has proved to be the case previously, at Ketton. Therefore, the Applicant develops its new rights of way as permissive, until it knows its operations are well away from those routes. At that point, the permissive routes can be dedicated and added to the definitive plan.

Temporary Diversion of E226

158. The time period over which the temporary diversion is proposed is not yet clear, as there is no detailed construction program. The bridge is a significant structure to build and with the associated landscaping, it is likely that the diversion will be in place for a year, although that is yet to be confirmed.

159. The surface of the temporary diversion will be the same as the existing bridleway. The diversion route will be constructed to ensure that it drains well and is not made impassable by surrounding vegetation.

HGV Crossing

160. It is noted that the RCC rights of way officer would accept that the gain from dedication of bridleway rights over part of FP E229 (along with the link to E226) would satisfactorily offset the otherwise negative impacts of the proposal.

161. The crossing design will be maintained to high standards as the crossing will fall within the registered mine/quarry area under the Quarries Regulations 1999. Safety will be paramount for all users. Regular monitoring of the crossing and the visibility splays to maintain a safe crossing.

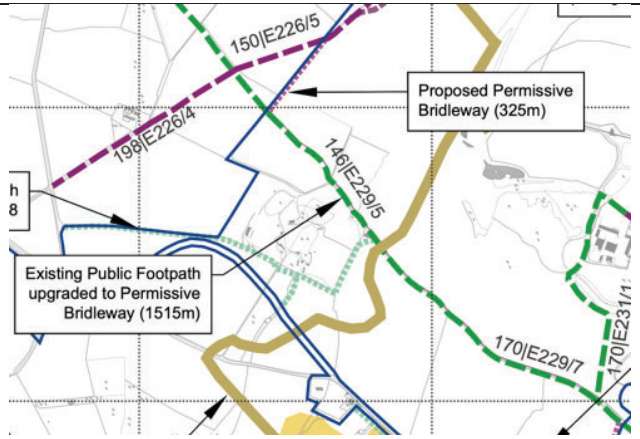
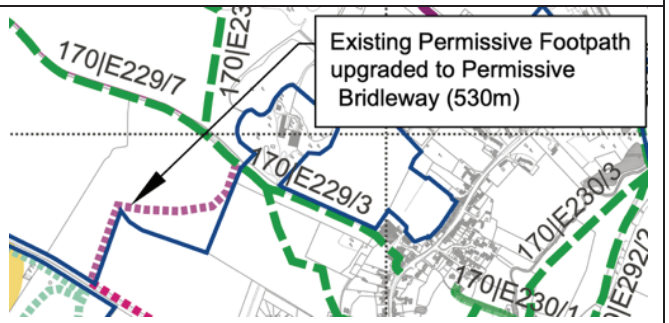
New Routes

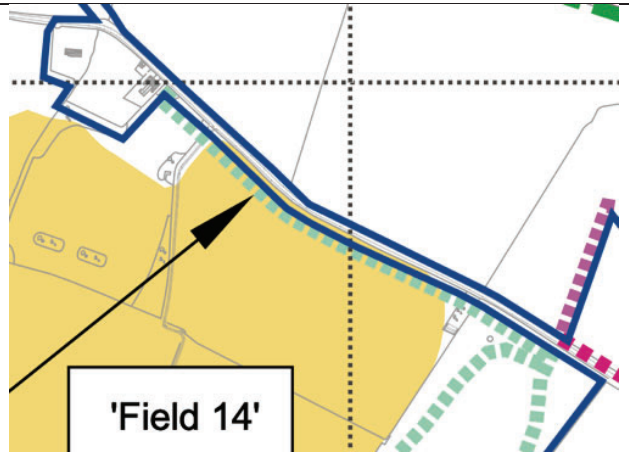
162. The highways authority provides no off-carriageway route between Ketton village and Wytchley Warren Cottages. Pre-application consultation response resulted in a permissive route being created from the Wooton close to Wytchley Warren Cottages. Similarly, in the existing quarry, there was a request for more

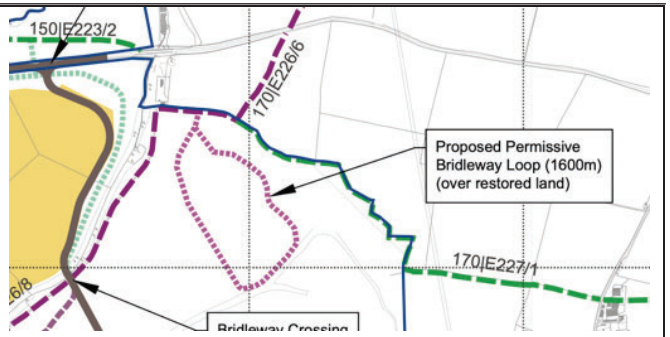
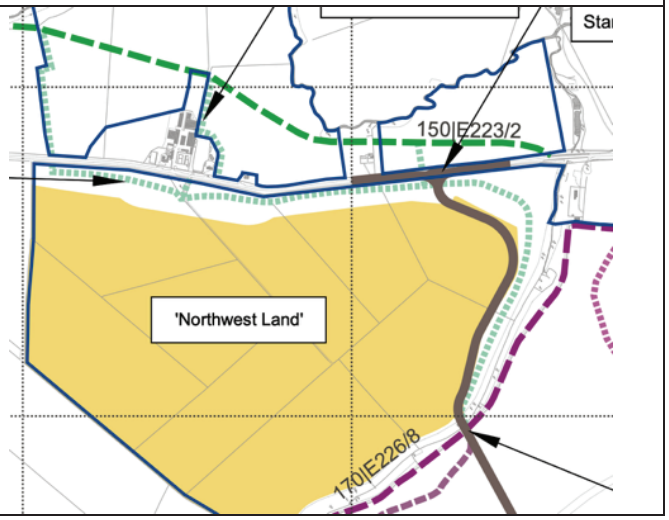
access. Similar requests were made for an off-road route adjacent to the A606 for cyclists. However, as the Applicant only owns a relatively short stretch of the A606 frontage, a cycle way is not a practical option, as it has nothing to connect to at either end. A permissive path is possible, though linking paths coming out of Empingham to bridleway E226 and onward routes to Ketton. Village.

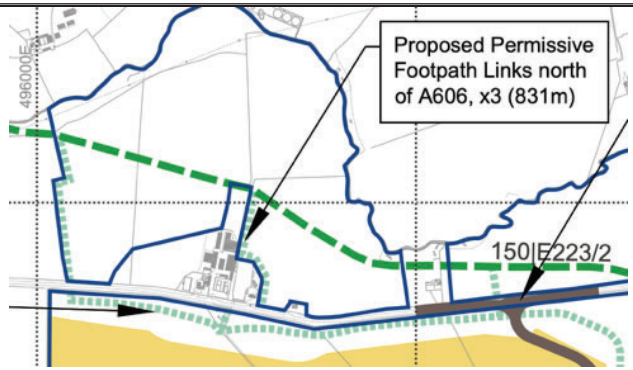
163. To address the above, the Applicant now proposes several upgrades to the rights of way scheme as set out in the table below.: -

Table 3 - Proposed Amendments/Upgrades to Rights of Way

Path E229	To be upgraded to bridleway, including a short east – west spur at the northern end of the quarry to link with bridleway E226.	With 12 months of the new planning permission being implemented.	
Field 12	Existing Permissive Footpath upgraded to Permissive Bridleway (530m). This will link to the section of path E229, which is to be upgraded to a bridleway (see above). The Appellant does not own the southern section of path E229; therefore, by upgrading the existing permissive path south of Field 12 to a bridleway, a link can be made to Empingham Road without involving third-party land owners.	Permissive initially and formally dedicated within 2 years of field 12 being restored.	

Field 13	The proposed 875m circular leisure route in Field 13 off Empingham Road	To be built and dedicated within 2 years of the new planning permission being implemented	
Field 14	Proposed 670m permissive routes to be built with necessary access points. (Alongside Empingham Road connecting Wytchley Warren Cottages to Field 13.)	To be built within 2 years of the new planning permission being implemented – initially as a permissive route and then dedicated as a public footpath within 12 months of the Phase 5 soil storage bund having been completed.	

Phase C3 – existing quarry restoration	New circular route linking to bridleway E226, to be built through the new tree planting in restored phase C3. (shown on plan as 'Proposed permissive Loop (1600m) over restored land)	To be built and dedicated within 2 years of the new planning permission being implemented – initially as a permissive route and then dedicated as a public bridleway within 12 months of the restoration aftercare being completed in that area.	
NW Land	New permissive path proposed between the proposed landscaping on the northern edge of NW Land and the A606 – 1,267m. The intention of this is to allow an off-carriageway route between Shacklewell Lodge and Bridleway E226 and others.	Two other permissive links to be added either side of Shacklewell Lodge to link to path 150/E223/2. This route will be permissive but can be dedicated on restoration of NW Land.	

	Two other links to be added either side of Shacklewell Lodge, to link path 150/E223/2 to the A606 and the permissive route mentioned above	These could be dedicated soon after creation.	

Ecological update

164. Due to the time that has elapsed since the initial ES was prepared, the Applicant has undertaken an ecological update for the development site.

165. A full PEA update for the Site using the UK Hab descriptions, rather than a Phase 1 Habitat Survey (in the original report), has been undertaken by Heatons, in accordance with the latest professional guidelines.

- Additional badger activity noted with extended ranges (rather than new setts) observed during walkover visits.
- Additional potential bat interest, notably in the woodland on the southern edge of Northwest Land.
- Additional brown hare activity was observed.

166. All of these species observations can be mitigated through appropriately timed surveys in advance of vegetation clearance, licenses where appropriate, advance planting and progressive stripping and restoration as set out in the draft CEMP.

167. The updated ecological assessment demonstrates that the conclusions detailed within the previous 2023 ES - Ecology Chapter have not significantly altered and remain overall both accurate and robust, with minor changes to habitats on Site still suitably mitigated for, due to the ecologically minded phasing and restoration designs.

168. Both the 'Field 14' and 'Northwest Land' boundaries remain materially unchanged in their importance since previous assessments and are likely to support the same species assemblages and populations as previously determined.

169. The proposed mitigation and enhancement measures continue to be deemed appropriate for the likely scale of ecological impacts.

Construction Ecological Management Plan (CEMP)

170. Appendix 8 of the Reg'25 Response sets out a draft CEMP for managing ecological impacts, as the development progresses.

171. An Ecological Impact Assessment prepared by Heatons (August 2023) was submitted as part of the Environmental Statement, with supporting Preliminary Ecological Appraisal (with Phase 1 Habitat Survey), Bat, Reptile, Badger, Wintering Bird and Breeding Bird surveys and reports in the Technical Appendices.

172. The updated walkover survey was completed by Heatons in August/September 2025. This has been compiled into a separate report and uses UK Hab descriptions (hereafter referred to as 'Heatons Ecology Update 2025 report') and has been used to inform this draft CEMP, where relevant.

173. The CEMP sets out a general framework for managing the various ecological aspects of the Site. The CEMP is suitable for reference in a planning condition,

although it is likely that across the life of the Site, any such condition should provide flexibility for the CEMP to be updated and adapted to reflect circumstances which may change over time.

Summary of Further Mitigation Measures Arising from the Reg' 25 Work.

174. Appendix 10 of this Reg 25 Response sets out an updated version of the mitigation measures table, being that submitted with the original ES, amended to include changes arising from the Reg' 25 Response.

175. The sections below summarise the latest changes.

Design Changes

Changes to Northwest Land

176. Phases 7 and 9, to be amended to provide a greater stand-off to the Anglian Water pipe, alongside the A606.

Changes to Field 14

177. Realignment of the limit of extraction and screening bund at Paradise Field to protect a small stand of Giant Redwood and an area of ridge and furrow in Paradise Field.

Noise

178. No changes are proposed to the mitigation strategy previously set out in the original ES.

Dust

179. An updated and more detailed dust management plan is now proposed, which replaces that in the original ES. This provides greater detail on how dust will be managed, monitored and reported.

PROW

180. The proposals now bring forward the opening and upgrading of several new and upgraded routes. They also introduce further routes in the Shacklewell area, parallel to the A606, to provide an off-road link between Empingham village and bridleway E226.

Archaeology

181. A written scheme of investigation (WSI) is provided to address paeleo archaeology.

Carbon

182. To address carbon emissions, as set out in the original ES, Heidelberg Materials will continue to pursue its carbon roadmap to achieve net zero for its business

by 2050.[31] The roadmap includes a number of areas that will help achieve net zero. These include:

- Increased use of alternative raw materials and alternative fuels
- Carbon capture and storage
- Fuel switching to hydrogen.
- Use of reduced CO2 products
- Improvements in plant efficiency and processes across our operations.

183. The Applicant has already reduced emissions at Ketton by 50% since 1990. The proposals, therefore, assume that Ketton will continue to follow the roadmap, which will evolve to incorporate new technology so that it approaches net zero by 2050.

Highways

184. A Road Safety Audit Stage 1 (RSA1) has been carried out and confirmed that the design is acceptable. RSA2 (detailed design stage) and 3 (construction stage) will be carried out should planning permission be granted.

185. The design of the new access remains sound and the likely effects are not expected to have an unacceptable effect on traffic flows or road safety.

186. From an amenity point of view, the residents of Ketton and Tinwell villages will see a notable drop in HGV traffic once the new road is built. A minor increase in traffic in Empingham village is expected, of four (4) vehicles per hour, i.e. one every 15 minutes. This is not considered significant.

Ecology

187. The Ecological Update Report confirms that the conclusions detailed within the previous 2023 ES – Ecology Chapter have not significantly altered and remain overall both accurate and robust.

188. The proposed mitigation and enhancement measures continue to be deemed appropriate for the likely scale of ecological impacts.

CEMP

189. As part of this Reg' 25 Response, a draft CEMP entitled '*draft Construction Ecological Management Plan for the Proposed Extensions to Grange Top Quarry – October 2025* – has been prepared by Felstone Consulting, is now submitted.

190. The CEMP provides details on how ecological matters will be dealt with and who is responsible for the areas of delivery.

191. This CEMP sets out the specific measures proposed at the Site and is structured as follows:

[31] https://www.heidelbergmaterials.co.uk/sites/default/files/2023-10/heidelberg-materials-uk-committed-to-reaching-net-zero-carbon-by-2050.pdf

- Summary of Ecological Constraints.
- Proposed Construction Works; and
- Protection of Designated Sites, Habitats and Species.

192. The CEMP is expected to be a live document that evolves across the life of the Site as ecological conditions change. Biodiversity Net Gain

193. Biodiversity Net Gain (BNG) has been assessed for the proposals, although statutory BNG does not apply to this application as it was only introduced in February 2024, after the planning application was submitted.

194. Notwithstanding that, the Applicant remains committed to delivering well over 10% BNG as part of the scheme through its landscaping and restoration plans.

CUMULATIVE IMPACT UPDATE

Existing Baseline – Update

195. The ES already includes a cumulative impact assessment and considers the variables within the EIA project.

196. This Reg' 25 Response, therefore, supplements that original assessment and considers changes arising from the Reg' 25 Response.

197. The assessment has regard to the potential successive, simultaneous and combined cumulative effects of the development proposal, taking account of their impact upon the above receptors.

198. The technical reports establish the baseline conditions, and the Regulation 25 work has, where requested, re-examined those assessments, to test the original findings, notably noise, carbon, ecology and highways effects, amongst others.

199. It remains the case, that: -

- There is no other major development around the Site with which the proposed development would accumulate its effects.
- There are no protected landscapes nearby.
- There is one SSSI within the Site (Ketton Quarries SSSI) and two close-by (Shacklewell Hollow and North Luffenham Quarry).
- Adjacent to Field 14, there is a Grade II listed windmill.
- The surrounding villages contain conservation areas, listed buildings and scheduled monuments, but none would be unacceptably affected (see HCUK Heritage Assessment in the ES appendices).

200. The largest potential group of sensitive residential receptors is on the eastern limits of Ketton village, particularly those properties based along Empingham Road in the vicinity of Wytchley Road and Wootton Close. These are close to Field 14 but over 2km from NW Land

201. Empingham village sits in the Gwash valley, adjacent to Rutland Water and 1km to the northwest of NW Land. Empingham village sits over 3km from Field 14.

202. Several residential properties exist along the A606 at Shacklewell, on the northern limit of the NW Land, but are nearly 3km or more from Field 14.

203. Properties on Empingham Road at Wytchley Warren Cottages/House (5 properties) and Wytchley Warren Farm and Bluebottle Cottage (both owned by the Applicant). These are the closest properties to the proposed quarrying activity and sit on the edge of Field 14 and the existing quarry.

Reg' 25 - Updates to Cumulative Effects

Noise

204. Further noise assessment work has been undertaken to assess the reliability of the original assessment. That work confirmed that the data and background noise level in the original noise assessment are robust and reliable.

Dust/Air Quality

205. An updated dust management plan has been provided in the Reg' 25 Response to provide greater clarity on dust management practices during the operation of the site.

Ecology

206. An ecological update confirms that the original assessment remains robust and that there are no unacceptable ecological effects.

207. A draft construction Ecological Management Plan (CEMP) is now included setting out how ecological matters will be addressed during the operation of the quarry.

Carbon

208. As part of the Reg' 25 Response, following a Supreme Court decision (Finch) and several other planning decisions, the Applicant has undertaken a revised climate change assessment for the project. This assessment has considered not just the EIA project, i.e. the extension of the quarry and construction of the new road, but also the carbon effects of producing cement at the Works (which sits outside the planning application area) and the other related potential likely significant carbon effects. These cover carbon emissions referred to as 'Scope 1, 2 and 3.'

Anglian Water Infrastructure.

209. Extensive investigations were undertaken with Anglian Water to ensure that its water pipe alongside the A606 remains fully protected. Consultation showed that this pipe had a particularly unusual construction type and was buried at great depth, well below the excavation level of the quarry and offset to one side of the limit of working. As a result of those investigations, an increased stand off from the pipe was agreed, allied with a specific ground vibration monitoring limit along the pipe alignment. Anglian Water subsequently withdrew its objection to the planning application.

Paradise Field /Giant Redwoods.

210. Consultation also revealed a scattered occurrence of Giant Redwoods in Paradise Field (part of Field 14). Consultees asked if some of these could be retained as part of the quarry proposals. The scheme has therefore been redesigned to retain some of these trees and the opportunity was also taken to

increase the amount of ridge and furrow land that can be retained in Paradise Field.

Highways

211. The proposed development is for the extension of the quarry and creation of a new access road for the Works, linking to the A606 Stamford Road through the new quarry. No changes are proposed to the Works i.e. the kilns etc, where the limestone and clay from the quarry are converted into clinker, cement and packaged for delivery.

Design Changes

212. The Reg' 25 Response has resulted in a few design changes. The most notable are to the design such as changes to the limits of extraction in NW Land alongside the A606 Stamford Road and at Field 14 in the vicinity of Paradise Field (south of Wytchley Warren Cottages).

213. Expanded mitigation measures have been provided in some areas, such as the dust management plan and the CEMP.

Key Effects of the Development

Adverse Effects

214. In this instance, the main adverse effects are -

- **Ecological** effects such as the loss of habitat or threats to protected species.
- **Blasting and ground vibration** perception effects from ground vibration at residential properties.
- **Dust and air quality** generated from the proposed quarry/restoration operations and the related transport sources.
- **Transport** impacts on highways matters as a result of a new access onto the A606.
- **Noise** impacts from quarry operations as perceived at sensitive receptors. Sensitive receptors are generally residential or commercial premises where members of the public could be exposed to noise from the development. It can also include sensitive ecological receptors.
- **Visual** effects such as changes in views and the removal of vegetation such as trees and hedges etc.
- **Agricultural** effects such as the loss of agricultural land or the lowering of agricultural land quality.
- **Carbon emissions** from the extension will amount to approximately 24 million tonnes total before any mitigation, over the life of the project. (About 0.0015% of total UK carbon emissions).

Beneficial Effects

215. In this instance, the main benefits are -

- Provision of nationally important cement that society needs (also referred to as the 'steady and adequate supply' in the NPPF).
- Retention of existing direct and indirect jobs that have been established for over 100 years, the Works being one of the largest employers in the county.
- Contribution to the local economy through business rates (£1.5 - £2 million per annum) and business spend on local services, as well as wages, which are also feeding into the local economy. This equates to about 3-4% of the Council's net budget.
- Amenity and highways benefit in Tinwell and Ketton villages once the main Works access is moved to the A606.
- Ecological benefits from a net increase in biodiversity.
- Public access improvements to introduce new routes, upgrades to footpaths to bridleway standard and improve off-road links from Ketton village to the bridleway network, as well as providing off-road links along Empingham Road between Wytchley Warren Cottages and Ketton village.

Cumulative Impact Update Summary

216. This ES has been reviewed following the Reg' 25 Response. This shows that there is only one significant adverse effect, i.e. carbon emissions. All of the other adverse effects are less than significant and can be mitigated to acceptable levels. Furthermore, none combine with any other development in a way that will render the proposed development unacceptable.

Local Effects

217. The combined effects of transport, noise, ground vibration, landscape impact, air quality and dust, as well as loss of agricultural land, have been cited as concerns by the local community. However, the ES indicates these matters are all within the limits set out in guidance.

218. The point of greatest disturbance will be during the initial site set-up (This includes the creation of new access and creation of the screening /landscaping measures)

219. Transport changes will slightly raise traffic on the A606 through Empingham by up to 4 vehicles per hour—a minimal impact for a main road. In contrast, the relocated access will divert over 40 vehicles per hour (during peak times) away from Tinwell and Ketton. Cumulatively, overall, the proposed changes to the access are significantly beneficial.

220. Visually, the Site will be well screened and whilst there will be a negative effect as new structures and bunds will appear in the landscape, the nature of those impacts will not be significant and will reduce as vegetation and tree planting become established.

221. The loss of agricultural land is a negative effect, but in most cases is temporary and phased across the life of the development. Restored areas are to be

restored to agriculture with the exception of the perimeter of Field 14, due to the steeper sides, which could be grazed, though will be too steep to cultivate.

Global Effects

222. Carbon emissions, whilst a significant effect, is not one that is readily noticeable locally. The carbon effect is a global warming one in the upper atmosphere. It does not, therefore, readily accumulate with other effects.

Temporary Effects

223. The operational effects of the quarry will be temporary and will cease to exist as the quarry is restored. Furthermore, the transient nature of the quarry means that the worst-case effects will only arise for short periods as the workings progress around the Site.

224. Once the development is completed, any noise, dust, traffic and ground vibration from it, will cease.

Cumulative Effects Conclusion.

225. No environmental effects arising from the proposed development have been found to accumulate to result in an unacceptable cumulative effect. Adverse impacts do arise, the most notable being carbon emissions, which are required to achieve net zero by 2050. Policy does not require any development to achieve net zero before that date.

226. The main benefits of the scheme are socio-economic, notably the national importance of cement from Ketton and the jobs and social stability the works provide locally for the wider community in an area where there are few large employers other than the public sector.

227. In conclusion, no unacceptable cumulative impact is envisaged that might justify refusing the proposed development. Whilst carbon emissions are a significant effect on their own, they do not justify refusing planning permission, given the work the applicant is doing to achieve net zero by 2050.

228. Multiple significant benefits arise from extending the quarry. Socio-economic benefits, such as maintaining nationally important cement supply, securing many jobs, benefit a construction market that Ketton has served for over 100 years. Its importance, both nationally and locally, is well established and clear. More specific to the project, maintaining works whilst diverting its traffic away from Tinwell and Ketton villages, together with the local benefits such as the increased biodiversity net gain that the project will deliver, are similarly cumulatively important and favour granting planning permission.

229. The 'do nothing' alternative, i.e. allowing the Site to close in 2032, would have a significant adverse cumulative effect on national cement supply and the socio-economic effect locally. In these circumstances, the cumulative impact strongly favours granting planning permission.

PLANNING POLICY UPDATE

Development Plan

230. The adopted Rutland Minerals Core Strategy and Development Control Policies (October 2010) support maintaining and extending the life of Ketton Cement Works. It recognises the Site's strategic national importance, its role in sustainable mineral supply, and the need to balance environmental protection with economic and social benefits.

Core Strategy Policies

231. MCS Policy 1 - requires proposals to be consistent with national sustainable development objectives. MCS Policy 2(b) requires a sufficient stock of permitted reserves of limestone and clay to supply Ketton Cement Works at an output of 1.4 million tonnes per year and commit to maintaining at least a 15 - year stock of mineral reserves.

232. MCS Policies 3 and 4 provide an "Area of Search" for Ketton Cement Works (Figure 4) for additional reserves. The proposed extensions fall entirely within that Area of Search.

233. Policies MCS Policies 7-9 and MDC Policies 1-5, 7-8, 11 require that adverse effects on communities, the environment, Rutland Water, heritage, landscape, and water resources are minimised and controlled to acceptable levels. The ES and Reg 25' Response confirm this to be the case. The only significant adverse effect is carbon emissions, see below.

Development Control Policies

234. MDC Policy 1 – controls the environmental effects of extending the Site. The ES and the Reg' 25 responses confirm that, with the exception of carbon emissions, there are unlikely to be significant adverse effects and those effects that do occur can be mitigated. Furthermore, the scale and significance of the beneficial effects (maintaining national cement supply, maintaining jobs at one of the County's largest employers, the major contribution to public funds biodiversity net gain, highway improvements (which benefit Tinwell) and expansion of the rights of way network) are considered to carry significantly more weight than the only significant adverse effect.

235. The development design includes comprehensive landscaping, noise and dust controls, heritage protection measures, and biodiversity enhancement, meeting the requirements of the development control policies.

236. MDC1 (x) is specific to carbon emissions and requires increases in pollution and CO_2 emissions to be considered. The original ES did consider these, but did not include a calculation of the carbon generated by the project. This Reg' 25 Response now includes a carbon assessment, which confirms the earlier ES conclusion that a significant adverse carbon effect is likely. However, it also notes that Heidelberg Materials' pathway to meet net zero will ensure the site meets the net zero aim by 2050. The carbon assessment, therefore takes an

absolute worst-case view and assumes carbon will be emitted at current levels, even though in practice that is not Heidelberg Material's intention.

237. Carbon has little obvious direct impact locally, as its effects occur in the upper atmosphere rather than on the site and its immediate surroundings. Carbon effects do not, therefore, accumulate in any appreciable way with any other environmental effects around the Site.

238. Most of the carbon emissions arise from the calcination of limestone. The Applicant has already reduced fossil fuel use to just 5–10%, is reducing it further and is already using electricity from its on-site solar farm. Furthermore, it is also reducing clinker content to produce low-carbon cement products. Together, these have already reduced emissions at Ketton by about 50% compared to 1990 levels. Full mitigation will require a carbon capture and storage scheme, but the lead-in times for developing this at Ketton mean that such a scheme is not expected at Ketton until the late 2030s, i.e. after the existing permitted reserves are already exhausted. Heidelberg Materials does not, therefore, have a developed CCS scheme it can present for consideration at this moment. The Environmental Statement, therefore, assesses the quarry extensions and assumes a worst case for the whole life of the project, i.e. that the current rates of emission continue unabated, to 2060. However, Heidelberg Materials is confident that through its own carbon reduction pathway, it will continue to steadily reduce emissions over the life of the site and achieve net zero by 2050, i.e. a decade prior to 2060.

239. MCS Policy 9 promotes sustainable mineral transport. The proposals align with this through the new access road that removes HGV traffic from Tinwell, and the continued use of rail deliveries (which replace between 50 and 70 HGV's per train load).

240. MCS Policy 12 and MDC Policy 12 -Require restoration to enhance biodiversity, landscape, and geodiversity, while securing long-term aftercare and financial guarantees. The proposed restoration scheme delivers all of these and enhanced public access, ensuring environmental and community legacy benefits.

Emerging Rutland Local Plan - October 2024

241. The Emerging Rutland Local Plan was recently examined, though the Inspector's Report is awaited. This document will replace the Minerals Core Strategy once adopted.

242. Emerging Policy MIN 1 maintains the area of search for cement primary and secondary materials, and notes that the Works: -

> *Is both a locally and nationally important cement manufacturing plant and relies mainly on locally quarried limestone from the adjacent Grange Top Quarry in conjunction with on-site clays to manufacture around 1.4Mt of cement each year. When the Site was granted permission for an extension*

> *in 2002 the permitted reserves of limestone and clay were 16.6Mt and 6.2Mt respectively; remaining reserves are now considerably less.*[32]

243. It goes on: -

> *any detailed working proposals to extract minerals need to be sufficient to maintain a stock of permitted reserves of at least 15 years. This does not mean that the whole area will be extracted. Given the current reserve position at the Ketton site, it is likely that a planning application will come forward within the cement AoS during the plan period to secure additional reserves for the cement works.*[33]

244. Policy MIN2 b) commits to providing at least 15 years of mineral for cement production.

245. Policy MIN4 replaces MDC1, but is less prescriptive and now requires: -

> *Proposals for minerals development must be expected to: identify and determine the nature and extent of potentially adverse impacts likely to result from the development and demonstrate how the proposal will protect local amenity, particularly in relation to dust, noise and vibration; secure safe and appropriate site access; and make provision to secure highway safety.*
>
> *Where potentially adverse impacts are likely to occur appropriate mitigation measures must be identified to avoid and/or minimise impacts to an acceptable level. Where applicable a site-specific management plan should be developed to ensure the implementation and maintenance of such measures throughout construction, operation, decommissioning and restoration works.*

246. Paragraph 10.55 goes on to identify the types of effects to be considered (similar to those in MDC1), though with the notable exception of carbon, which is covered separately in Chapter 4.

247. Emerging policy, therefore, expects a planning application for an extension to the quarry, allocates resources for it and expects to provide a minimum reserve of at least 15 years.

248. The new local plan requires the assessment of environmental effects to demonstrate that the development is acceptable against the council policies, both for individual effects and cumulative effects. As the section above demonstrates, there is only one significant adverse effect, but that one significant adverse effect needs to be considered in the broader planning balance (see below).

[32] Rutland Local Plan – October 2024 – paragraph 10.13
[33] Rutland Local Plan – October 2024 – paragraph 10.19

National Policy - NPPF Dec 2024 Changes Regarding the Proposed Development

249. A full assessment of NPPF policy is set out in the original planning statement. In relation to this planning application, most NPPF policies remain unchanged, although the numbering in the NPPF December 2023 was amended by newer policies inserted in December 2024. The summary below concentrates on the key effects of the NPPF Dec 2024 changes so far as they relate to the development.

250. The wording of NPPF Section 17 (minerals) remains unchanged except for its numbering. Cement making materials are still seen as essential and 'great weight' is required to be given to the benefits of mineral extraction, including to the economy. Cement making materials remain nationally important in the national policy, both through the NPPF and NPPG.

251. NPPF Section 17 also requires planning authorities to maintain both a steady and adequate supply[34] and a stock of permitted reserves[3536] of industrial minerals of at least 15 years. It must also provide policies that allow for their extraction[37], and give great weight to the benefits of that extraction, including to the economy.[38]

252. The NPPG also advises that: -

> *Stocks of permitted reserves should be calculated when a planning application is submitted to extract the mineral (through either a site extension or a new site) or when new capital investment is proposed.*
>
> *The overall amount required should be directly linked to the scale of capital investment to construct and operate the required facility (such as a cement plant or brick factory).*[39]

253. The planning application will give a stock of reserves that is expected to last until 2060, i.e. 35 years.

254. Given the significant investment at Ketton—both in the new road and the proposed bridleway bridge—a substantial reserve is necessary. The proposed stock exceeds the minimum required by the NPPF and NPPG and reflects clear, logical site boundaries that are supported by both adopted and emerging development plan policies. This enables a coherent development limit for the two extension areas, avoiding a piecemeal approach that would likely trigger another application in a few years. A comprehensive, coordinated scheme is

[34] NPPF paragraph 227a
[35] NPPF paragraph 227 c
[36] NPPF footnote 81
[37] NPPF paragraph 223 a.
[38] NPPF paragraph 223 f, 224 b, 224, 224 c
[39] NPPG Minerals - paragraph: 088 Reference ID: 27-088-20140306 Revision date: 06 03 2014

therefore preferable, especially as the Council is not restricted by any upper limit on reserve stock.

255. The climate change section[40] now makes specific mention of the transition to net zero by 2050. However, that principle was already national policy anyway, as a result of the Climate Change Act and several recent court decisions[41] . The latter also influences policy on evaluating climate impacts within the EIA process and those are reflected in this Reg' 2025 Response.

256. As set out above, cement is essential in the UK and future cement demand will generate significant carbon, whether from extending Ketton or from importing cement from abroad instead. The original ES alluded to a substitution potentially being the worst of those two options. However, given the findings of the West Coast Mining case, the applicant accepts that there are difficulties in accurately assessing the carbon effect of every other possible cement source, meaning that accurately assessing a substitution argument is not realistically possible. Therefore, the ES no longer advances a substitution argument in relation to the carbon effects. It does however remain the case that imported cement will clearly carry its own carbon impact for the foreseeable future, as there is only one operational cement CCS plant in the world. Furthermore, Ketton Works can be shown to perform better than the industry average for the EU/UK and its trading partners.[42]

257. The indirect effect of the NPPF changes is also highly relevant with regard to need for the development. The government has increased housing targets and promotes extensive green energy infrastructure, which will inevitably require a corresponding increase in cement supply to deliver these new buildings/structures. Therefore, it is reasonable to assume that the corresponding stock of minerals required at cement making facilities will need to increase proportionately, unless the government's intention is instead to rely on using cement imported from other countries. Nothing in policy suggests that this is intended; indeed, Section 17 is clear that the UK should be providing a steady and adequate supply of its own wherever possible.

258. In terms of the NPPF 2024 changes, the proposed scheme remains of significant value to the public interest. It underpins fundamental policy aims for increased housing and a transition to a green economy, with essential cement supplies. The project is, therefore, fundamental to both the national and local economies. Without cement, neither of these policy aims can be delivered.

[40] NPPF paragraph 161.
[41] R (Finch) v Surrey County Council [2024] UKSC 20 on evaluating climate impacts within the EIA process; and South Lakes Action Against Climate Change v Secretary of State for Levelling Up, Housing & Communities & West Cumbria Mining Ltd) (the WCM case
[42] Dustscan AQ - Climate change Assessment – Grange Top Quarry Jan 2026 – paragraphs 38 and 101.

259. More generally, the NPPF[43] provides three goals - economic, social and environmental factors when considering sustainability. In chapter 6, it confirms decisions should help create the conditions in which businesses can invest, expand and adapt. Significant weight should be placed on the need to support economic growth and productivity, taking into account both local business needs and wider development opportunities.[44]

260. The NPPF goes on to enable sustainable growth and expansion of all types of business in rural areas and diversification of agricultural and other land-based rural businesses. It goes on to say that growth should be sensitive to its surroundings, should not have an unacceptable impact on local roads and exploit any opportunities to make a location more sustainable.[45]

261. 'Significant weight' should be given to supporting economic growth, and 'great weight' should be given to the benefits of mineral extraction.

Policy Update Conclusion

262. In summary, the planning policy principles established in the scheme remain largely unchanged and continue to support the approval of planning permission, as the development aligns with both current and emerging development plans.

263. Great weight should be given to mineral extraction, and significant weight should be given to support economic growth.

264. The ES and Reg' 25 Response show that the proposals have no unacceptable significant adverse environmental effects apart from carbon emissions.

265. The likely carbon emissions are expected to be significantly adverse and can only be mitigated over a longer period. However, government policy gives industry a 25-year period of grace to reduce carbon emissions, aiming to achieve net-zero by 2050, i.e. partway through the proposed development. The 2050 deadline recognises that decarbonising is complex and requires significant changes to many industries, which cannot be delivered overnight, in a practical way.

266. In terms of planning policy, the planning authority is therefore required to balance the positive and negative aspects of the scheme. The only significant adverse effect of the scheme is carbon emissions (which the Applicant is actively reducing already), whilst the beneficial effects cover matters such as essential cement supply, job retention, and other environmental enhancements. i.e. The Applicant's view of this balance is that it is in the public interest to accept a trade-off between the carbon emissions of the scheme as the benefits of granting permission are a much more significant to society. The

[43] NPPF Paragraph 8.
[44] NPPF paragraph 85 – Building and strong, competitive economy.
[45] NPPF paragraphs 88 – 89 - Supporting a prosperous rural economy.

Applicant's case remains that the benefits of the scheme significantly outweigh the adverse effects.

267. The original ES concluded that a significant carbon effect would arise. The Regulation 25 Response now provides a climate change assessment that quantifies the carbon emissions in accordance with recent case law, and confirms that the original findings of the ES remain valid.

268. The original ES compared the substitution carbon effect of imported cement (from 2032 onwards) against the carbon effect of the proposed scheme (in a generic way). As a result of that case law, the applicant no longer advances that carbon substitution argument, as case law requires an accurate assessment of all possible sources of imported cement. Such an assessment is impractical. Whilst it is beyond doubt that any imported cement would inevitably generate carbon to a significant degree, the Applicant's case now focuses on the policy (both national and development plan) support for the Works to continue in operation beyond 2032.

269. In summary, both national policy and the development plan overtly support the need to maintain a viable cement industry at Ketton because it is nationally important for the UK construction industry. The extensions are, therefore, essential within the public interest. Minerals can only be worked where they are found and Ketton, as one of only 10 places in the UK where cement is produced, has an allocated area of search from which it can source further cement making materials.

270. The public benefits of allowing the extension are securing nationally important cement supply, local jobs and finance and other environmental enhancements such as BNG, public access and improved highway/traffic routing to improve amenity in Tinwell.

271. As extending Ketton Cement Works aligns with the development plan and supports public interest through sustainable practices, including, not least significant socioeconomic benefits, that the trade off with any adverse effects is worthwhile, especially if the operator is committed to mitigating those few adverse effects that do arise.

PLANNING BALANCE

Introduction and Purpose of the Planning Balance

272. Section 38(6) of the Planning and Compulsory Purchase Act 2004 and NPPF paragraph 11, require planning applications to be determined in accordance with the development plan, unless material considerations indicate otherwise.

273. This duty requires the decision-maker to establish whether a proposal accords with the development plan as a whole. Accordance does not require every part of a proposal to match every policy. Accordance can still be achieved even where policies pull in different directions[46]. A decision maker must, therefore, assess the competing policies and decide whether, in the light of the whole plan, the proposal accords with it [47]. The exercise is not mathematical or a question of counting[48], but requires a series of judgments to be made, possibly including determining the relative importance of the policy, the extent of any breach and how firmly the policy favours or sets its face against such a proposal[49].

274. The planning balance section, therefore, weighs the benefits/disbenefits of the proposed quarry extension against planning policy and other material considerations. In the context of minerals development, it must also recognise that mineral extraction is a temporary use of land and ultimately, that development will be removed and the site restored. It then concludes by assessing whether the development accords with the development plan.

Development Background

275. The premise of the planning application is that cement is essential for the UK to maintain its existing infrastructure, build new homes and provide the facilities to transition away from fossil fuel use. From the public interest perspective, this cement can either come from within the UK, or it be imported from abroad.

276. The permitted reserves at Ketton will be exhausted in 2032. The proposed extension to Grange Top Quarry will allow cement production to continue to 2060.

277. The proposal does not seek to make any changes to the Works itself, other than altering the access route to it.

Development Plan and Policy Context

278. The need for cement is inherent in both national and local planning policy, both noting it as essential and of national significance. It therefore follows that, whilst cement remains an important construction material in the UK, there will be a need for the planning system to maintain a steady and adequate supply of it. Policy does this by requiring minimum stocks of permitted cement making

46 R v Rochdale Metropolitan Borough Council, ex parte Milne [2000] EWHC 650

47 City of Edinburgh Council v Secretary of State for Scotland [1997] 1 W.L.R. 1447 at p1459D-F

48 Dignity Funerals Limited v Breckland District Council [2017] EWHC 1492 (Admin)at [68]-[70]

49 R v Rochdale Metropolitan Borough Council, ex parte Milne [2000] EWHC 650 at [51]

materials of at least 15 years. At Grange Top Quarry, the current stock stands at 7 years, less than half of the minimum required in policy.

Rutland Minerals Core Strategy – Spatial and Strategic Objectives

279. The adopted development plan promotes an extension to Grange Top Quarry and allocates a large area of search for cement making materials to deliver it. The area of search has also been rolled forward into the emerging Rutland Local Plan.

280. This planning application sits within the area of search and therefore, accords with the strategic policy aim to extend the quarry.

Development Control Policies

281. The ES has considered a wider range of environmental effects in relation to the proposals and concludes that several significant beneficial and just one significant adverse effect will occur from the proposal.

282. Significant beneficial effects are: -

- Maintain nationally important cement supply.
- The cement can be used to support several major governmental goals, notably -the transition to green energy, building 1.5 million new homes and improve water treatment and river water quality, amongst others.
- Support the community and over 3000 related jobs for another 35 years.
- Maintain significant contributions to local finances, e.g. £1.5-2million pa in business rates.
- Divert traffic away from Tinwell and Ketton villages whilst maintaining cement supplies.
- Deliver 10%+ biodiversity net gain.
- Provide enhanced public access.

283. The only significant adverse effect is carbon emissions. The ES has been assessed on the assumption that zero mitigation is employed, to establish a worst case. In reality, Heidelberg Material's roadmap to net zero, intends to achieve net zero by 2050, consistent with national policy. National policy under the Climate Change Act 2008 gives industry a 25-year window to reduce its carbon emissions to net zero. Heidelberg Material's proposal aims to meet this goal.

284. Lesser adverse effects arise, those effects either fall within the thresholds of acceptability or can be controlled by appropriate mitigation and planning conditions that ensure they are kept to reasonably acceptable levels.

285. One particular effect, identified as both a positive and negative, is the transport effect arising from the new access. The new access was included to respond to requests from the council to divert Works traffic away from Tinwell. The proposal is strongly supported by the Tinwell/Ketton communities. However, the Empingham community has expressed concern due to the traffic increase through their village along the A606. This is considered further below. Regardless

of these polarised views, the Transport Assessment shows that the proposals satisfy the council's highway policies. Neither Highways England, nor the Highway Authority objects to the proposals.

286. Other environmental effects have been assessed and found to be within the bounds of acceptability, both individually and cumulatively. All are capable of being controlled by conditions.

National Policy Context

287. As set out above, national policy gives 'great weight' to applications to excavate important cement making materials and promotes minimum (as opposed to maximum) stocks of permitted reserves.

288. National policy therefore supports the importance of cement production and Ketton Works.

289. However, national policy also requires development to be sustainable by according with other development plan policies, taken as a whole, unless there are material reasons not to.

290. A key consideration is the key effects of the development on economic, social, and environmental objectives. They are not criteria against which every decision can or should be judged. Planning policies and decisions should play an active role in guiding development towards sustainable solutions, but in doing so should take local circumstances into account, to reflect the character, needs and opportunities of each area.

291. The sections below consider the planning balance in these matters.

Beneficial Effects

Securing the Long-Term Supply of Cement

292. Ketton Works has been supplying cement to the UK for over 100 years, but its permitted reserves expire in 7 years (2032). Granting planning permission for the extension will extend that supply for 35 years (including the already permitted 7 years).

293. The Works is strategically important in the UK, being the closest rail connected cement works to the busy south east/London region, where demand for cement is highest. Heidelberg Materials has a cement distribution facility at St. Pancras/Kings Cross, in the heart of London.

294. If Grange Top Quarry is not extended, from 2032, the UK construction industry will need to import 40-50% of the cement it needs. Extending the life of the quarry will leave the UK in control of its cement supply and less reliant on other countries providing materials that are essential to live our daily lives. Therefore, the question is whether it is in the public interest for the UK to be self-sufficient in cement, or is it better to rely on the vagaries of the international markets to underpin its need for its essential cement supply.

Efficient Use of an Existing Quarry and Cement Facility

295. Cement works require huge investment, and it is logical and sustainable that where such investment has already been made, these existing facilities should be used, in preference to developing a new cement works on green field land elsewhere, where no skills base exists.

296. Current policy for efficient resource use is to reuse plant/buildings wherever possible. Extending the life of an existing Works (and retaining the existing jobs and skills) is sustainable, especially when the products it makes are essential for both the economic and social objectives of the NPPF, and the mineral reserves can be won and worked in an environmentally acceptable way.

Economic and Employment Benefits

297. The proposal preserves a significant number of jobs with over 3000 roles relying to varying degrees on the existence of the Works.

298. The do-nothing scenario, i.e. refusing planning permission, has the potential for a comparable scenario with the social effects of the closure of coal mines in the 1980s/90s, where a single large employer dominated a community. In that scenario, the loss to the community was both significant and long lasting. The Institute for Fiscal Studies examined the effects of the collapse of the UK coal industry on the communities and miners and noted evidence of substantial losses that are persistent and remain significantly depressed fifteen years later.

299. Maintaining a local employer is, therefore, beneficial not only to those directly affected but the social effects also spread to the wider community. The local economy benefits from both the money the operator directly spends on goods/services and the wages its employees and suppliers spend in the wider area. The Heidelberg Materials Social Profit Report for 2022 indicated over £11 million was spent in the local economy.

300. Local government benefits too, from payments such as annual business rates, which vary between £1.5-2 million per annum. The Works is the largest rate payer in the county, its rates bill equating to 3% of the council's 2024/5 net budget.

Sustainability and Resource Efficiency

301. Minerals can only be worked where they are found and where particular minerals are in short supply, such as cement, the local authorities are encouraged to maintain production at a level that will support both their own need and the need of other areas lacking in those minerals.

302. Only 10 cement works exist in the UK, yet there are 381 principle local authorities. All of these local authorities have development plans promoting construction, yet all 381 rely on just 10 cement works.

303. However, the 10-cement works are only supplying two thirds of what the county needs. If Ketton were to close in 2032, that two thirds will likely drop to a half. It

is therefore in the public interest to maintain current levels of production and, if possible, increase it to make the country self-sufficient in cement once again.

304. The development plan recognises the national importance of this and plans for an extension to the Works.

305. As the proposal provides a phased scheme that minimises environmental disturbance, it is considered to be sustainable given the findings of the ES.

Restoration, Afteruse, and Environmental Enhancement

306. The proposed restoration and landscaping scheme are consistent with the development plan aims and create a broadly agricultural and habitat creation-based scheme. Biodiversity will be increased by at least 10% compared to the current arable monoculture across much of the site. This approach is consistent with the restoration work on the existing site, which is already enhancing biodiversity.

307. The proposed CEMP reflects the ecological assessments of the site and provides a framework to deliver future ecological enhancements.

308. Aside from the restoration, the landscape and public access proposals, notably updated stand offs at Paradise Field (Field 14) and NW land, accord with the council's design and landscape policies. Even though changes to the landscape will result from the quarrying, those changes will enhance biodiversity, and the new landforms and planting have been designed to blend into the landscape.

309. Geodiversity will be maintained. A Regionally Important Geological Site is already well established and regularly visited by geological groups. A SSSI also sits in the existing quarry and adjacent land, and is thriving, despite being part of an active quarry. The adjacent Shacklewell Hollow SSSI is also being protected by the proposals.

Adverse Effects

Ecology

310. The Ecological Update Report corroborates the conclusions from the 2023 ES, which remains robust, with the proposed mitigation remaining relevant and appropriate. Some small disturbance effects arise, however, as most of the site is sterile arable land, for such a large development, the ecological effects are not significant, can be managed and BNG delivered.

311. In excess of 10% Biodiversity Net Gain (BNG) is proposed, even though statutory BNG does not apply, because BNG was only introduced in February 2024, after this application was made.

Landscape and Visual Impact

312. Landscape and visual protection drove the scheme design, particularly minimising visual effects from public areas and residential properties in the

vicinity of Wytchley Warren Cottages, along the A606 at Shacklewell and further afield at places such as Empingham village (1km distant).

313. Temporary adverse effects arise whilst landscaping works are created to screen the site. Bund construction is likely to be visible, though once seeded and planted, bunds quickly blend with the surrounding land and maintain the overall landscape character. As the planting matures, the screening will develop a wooded appearance that reflects the woodland blocks that scatter the surrounding area.

314. Mineral development is temporary and the restoration will return the site to a non-industrial use. Restoring progressively minimises the areas of active quarry open at any one time, which will contain any quarrying effects. Areas will only be stripped of soils when needed, such that some later phases are likely to remain in farming use for another 20-30 years from now until needed for quarrying. By that point, any landscape tree planting will be mature, and the earliest phases will be restored. By 2065, the whole site should be largely restored.

Residential Amenity

315. Effects on residential amenity have been addressed with regard to noise, dust, vibration, lighting, and hours of operation, etc. This has been achieved through a combination of stand offs, separation distances and landscape mitigation measures. Combined with monitoring regimes for noise, dust and blasting, any deviation from the permitted standards can be identified and corrected, as necessary.

316. Any planning permission will be subject to a range of conditions controlling these environmental effects on neighbours.

317. Outside the planning system, the site also has to comply with an environmental permit, and is regularly monitored under both planning and permitting regimes.

Transport and Highway Considerations

318. The proposed new access was requested by the county council to improve amenity in Tinwell and Ketton villages, particularly for roadside properties. Most quarry HGV traffic passes through these villages at present. The new access has drawn support from Ketton and Tinwell villages, because it removes approximately 40 HGVs per hour (during the morning and evening peaks) (182 HGVs per day) from the main street.

319. However, the new access will introduce traffic along the A606 through Empingham village. The Transport Assessment estimates up to 4 HGVs per hour (during peak periods) will pass along the A606 through Empingham village.

320. The new access, therefore, has both positive and adverse impacts. However, on balance, the scale of beneficial effect of removing 40 vehicles per hour from Tinwell and Ketton, far exceeds the adverse effect of four vehicles per hour along the A606 through Empingham. The A606 is recognised by the

Highway Authority as a strategic route for HGV traffic through the county, whereas the A6121 through Ketton and Tinwell is not.

321. It is, therefore, policy in the county transport plan to direct HGV traffic onto the A606.

322. A Road Safety Audit Stage 1 (RSA1) confirms that the new access design is acceptable and unlikely to have an unacceptable effect on traffic flows or road safety.

323. Both Highways England and the Highway Authority have confirmed that they have no objection to the new access.

324. However, the Works continues to deliver cement into London by train, which it does two to three times per week. Each train saves 50-70 HGV road trips, equating to approximately 10,000 HGV miles saved per train.

Water Resources

325. The proposals restrict the working to above the water table and the flood risk assessment demonstrates that no unacceptable flood effects are likely, even after taking into account the potential effects of climate change.

Heritage and Archaeology

326. As with the existing site, a full archaeological monitoring and recording condition will be applied. Evaluation work has already identified a small number of archaeological sites, particularly on the NW Land, that are worthy of recording. The Reg' 25 Response also includes a written scheme of investigation (wsi) for paleo-archaeology.

Carbon Emissions.

327. The Climate Change Act 2008 requires the UK to achieve net zero emissions by 2050. Adopted policy requires developers to have regard for the carbon emissions and take full account of all climate impacts. The ES has taken these matters into account. Carbon policy does apply a moratorium on carbon generating proposals. It does expect them to reduce their emissions over the next 25 years (by 2050), although, even then, there is no policy that requires proposals to be rejected if they generate carbon after 2050.

328. Heidelberg Materials is fervently pursuing its own business goal of net zero by 2050. It is expected that, as 2050 approaches, the construction industry will shift over to low-carbon cement. It is in Heidelberg Materials commercial interest to transform its processes to low carbon to match this shift; however, doing so viably will take time due to the costs and lead in times. Making a cement works carbon free is done in a variety of ways, but the most significant are shifting away from fossil fuels and capturing carbon from the clinker production. Ketton has already reduced its fossil fuel use to less than 10%. Carbon capture is more difficult and expensive.

329. The shift to low carbon is only in its formative stages, with most builders unwilling to buy more expensive, carbon free cement.

330. Heidelberg Materials is nonetheless reducing its carbon emissions through its carbon reduction roadmap. This includes introducing low carbon fuels, lower clinker content in cements, and concrete designs that use less cement, amongst other approaches. CCS remains a significant 'step change' part of its roadmap, but CCS in cement is in its infancy and is not yet feasible at Ketton. Heidelberg Materials is committing to this technology across its wider business, but it will take time as the investment costs, logistics and viability are significantly complicated. They also require national and international policy cooperation to shift the global construction sector into making low-carbon materials the preferred option for builders. Until that policy change happens, low-carbon cement will struggle to compete viably with cheaper higher carbon cement as both cement types have the same physical properties and uses, but the low-carbon version is the most expensive.

331. In the meantime, the public still demands over 11 million tonnes of cement every year, regardless of whether it is low-carbon or not. This tension between supplying what the public wants, when it wants it, versus making cement carbon free, necessitates some trade-offs in planning decisions. Ultimately, the Climate Change Act accepts that net zero is not likely until 2050, giving sites like Ketton 25 years to achieve that goal. It does not demand that net zero is achieved immediately.

332. Many carbon reduction programs currently rely on government support as there is little commercial merit in producing an expensive low-carbon product when there is a more widely available, cheaper alternative in the market. This is why national and international policy needs to play a major part in making low-carbon cement the go-to option for the construction industry. At the moment this is not the case as those policies are lacking and those that do are largely ineffective.

333. Notwithstanding these issues, Heidelberg Materials roadmap has already delivered the world's first fully operational cement CCS plant (in Norway) and further schemes, including one in the UK, are already under development. In time, a CCS scheme will likely feature at Ketton, but presently we cannot provide a definitive scheme, nor a timescale for its delivery, for the reasons set out above.

334. National policy allows 25 years for changes to deliver net zero, and as Heidelberg Materials has shown, it has already made great strides in that aim and is leading the industry both in the UK and internationally. Its roadmap plans to deliver net zero at Ketton by 2050.

Overall Planning Balance

335. The planning balance turns on the importance of cement in the public interest. Cement is essential for most construction projects. Cement is ubiquitous; each

and every one of us needs it for shelter, transport, healthcare, employment, education, sanitation or many other uses. It is such a major part of our daily lives that we barely register we are using it, yet hardly a minute goes by that any of us aren't using it. That is how fundamental cement is to the public interest. After air, water, and food, it is our most used substance.

336. From a national perspective, cement is essential, yet we can only supply two thirds of what we need, and rely on just 10 plants to support construction activity in 381 local authority areas.

337. The quarry extension will allow Ketton Works to continue to deliver cement for another 35 years, but even then, the UK will not be self-sufficient in cement. Refusing permission will likely result in the UK importing 40-50% of its cement from abroad. The UK construction industry is, therefore, already in a very weak position, with builders left to fight over the limited indigenous cement supplies.

338. The public benefit in maintaining an indigenous cement supply from Ketton, is already beyond being important. Several other operators recognise the perilous state of indigenous UK cement supply and have publicly announced plans to import more foreign cement for UK construction projects. This has the double negative effect of both leaking UK cash from the domestic economy to pay for those imports and leaving the cost of UK infrastructure exposed to the vagaries of international imports.

339. It is for reasons such as these that national policy recognises that cement is essential and planning applications for it should be given 'great weight'.

340. At a local level, Ketton Works is strategically important because it is the largest commercial employer in the county. All other large employers in the county generally rely on public funding to support their jobs, e.g. local government, NHS and military. Ketton is one of the few income generators that support the local economy.

341. An assessment of impacted jobs suggests that 3000+ people derive at least part of their income from the existence of Ketton Works. The socioeconomic importance of the site is, therefore, significant in such a small county. More concerningly, the lack of alternative employment locally means that if the Works closed in 2032, the socioeconomic effects would likely be adverse and prolonged. There are, therefore, a significant number of local people who would benefit from the Works remaining in operation until 2060.

342. Local Government is similarly affected, as the Works business rates (£1.5-2 million pa) is nearly 10% of the total business rates collected in the county and in 2024/5 equated to about 3% of the county's net budget. The business rates bill is twice the size of the next largest rate payer. Without an operational cement works, these funds would be lost overnight, and the council would need to seek other ways to balance its finances. This effect would be avoided if planning permission was granted for the quarry extension.

343. However, the primary reason to grant permission is that the development plan expects there to be a quarry extension and promotes maintaining an output from the Works, of up to 1.4 million tonnes per annum. The proposals meet this aim and sit within the allocated area of search.

344. The scheme has few adverse effects and only one significant one, for which the Applicant already has an evolving mitigation plan that it has been implementing for many years.

345. It is therefore paramount that the development plan intends that the quarry will be extended. It recognises that the extension is nationally important and national policy gives great weight to granting planning permission for such development. In the planning balance, no other adopted policy comes close to carrying this level of weight.

Weight Attributed to Identified Harms

346. In summary, the proposals will secure indigenous cement supplies for the next 35 years in a sustainable way. In doing so, it will also support the local community through 3000+ jobs, spending on goods/services, and paying substantial business rates for that same period. These carry significant weight for the public interest both nationally and locally.

347. National policy gives great weight to both mineral extraction and economic development. In the planning balance, this double 'great weight' stands proud of all other policy aspects and provides a low bar for granting planning permission, yet a very high bar should a decision maker wish to refuse permission. i.e. refusal would require something so important that it eclipses this double policy's great weight' attached to the proposal. Such an adverse effect/effects have not been encountered in preparing the ES.

348. The scheme provides multiple other public benefits, including removing HGV movements from Ketton and Tinwell villages, a matter so locally important that the council specifically asked for it to be incorporated into these proposals, despite its estimated £10million cost.

349. BNG enhancement and improved public access are similarly valuable, though not as weighty, as the above matters.

350. The adverse effects can, in the main, be effectively mitigated. Carbon is the only significant adverse effect. National policy accepts that industry will need time to adapt to net zero and it gives a 25-year window to achieve it i.e. by 2050. Heidelberg Materials is implementing its roadmap to achieve net zero by 2050, consistent with the aims of the Climate Change Act 2008. Therefore, whilst carbon emissions from cement are a material consideration, Heidelberg Cement is already pursuing the carbon reduction aims expected of it.

351. It is also material that cement plays an important role in delivering green infrastructure. Wind farms, nuclear, solar, etc, all need cement, as does increased housing. There is, therefore, a tension in that cement generates

carbon, but is essential to deliver projects that can reduce carbon by a much greater degree. Therefore, whilst carbon emissions from cement are material, the carbon benefit from the green energy infrastructure built with that cement can be much greater. Nuclear power, in particular, requires huge quantities of cement but massively reduces carbon emissions. Sizewell C is expected to save 9 million tonnes of carbon per annum, but uses only 750,000 tonnes of cement. The adverse effect of carbon is therefore significant, but the benefits it brings are well worth the trade-off. The weight attributed to carbon effects is therefore substantially less than the benefit of maintaining a cement supply because of how that cement is used.

352. In the planning balance, Ketton Works has operated for over 100 years and is a major part of the local community. It provides essential cement that will help transform the UK into a green economy and deliver the homes the public needs. Its environmental mitigation and controls have been continually improved over time, notably through its environmental permit and planning permissions. Both provide strong controls for running the site and are regularly monitored. Any new planning permission will continue in the same vein. The effectiveness of the existing regime similarly carries significant weight and demonstrates a long running efficient and well run the site.

353. All mineral planning permissions are also subject to Environment Act 'ROMP' reviews (usually every 15 years), where the planning controls are updated to reflect best practice at the time of each review. This will ensure that over the 35-year life of the development, any conditions will evolve rather than run the risk of becoming outdated. Again, this carries positive weight as it ensures that, unlike other built development, any new quarry permission can be revised as circumstances dictate.

Planning Balance Summary

354. Cement is not a choice or luxury product; it is an essential material for almost everything society needs. If it isn't produced at Ketton, the public interest is likely to require that it be imported from elsewhere.

355. In extending the site, a significant number of jobs will be retained for a considerable period, thereby protecting the local community and contributions to local government finances. The Applicant estimates that in 2022 alone, it spent over £11 million on employment, goods, services and other funding in the community.

356. There is only one significant adverse effect (carbon) from the scheme and, whilst it is significant, it is a matter that is being dealt with and will be reduced to net zero by 2050, in line with the Climate Change Act 2008. All other effects are capable of being mitigated through planning conditions and the Site's environmental permit.

357. Comparatively, the beneficial effects of the scheme, therefore, outweigh the negative effects by a large margin, as those adverse effects that do arise do

not justify undermining nationally important cement supply nor warranting the major socio-economic effects on the community that would arise if the proposal was refused.

358. The proposals accord with the development plan when read as a whole. National policy, therefore, requires the decision maker to give 'great weight' to granting planning permission.

CONCLUSION

359. The development plan and national policy support this proposed extension to the quarry. Cement is necessary, required and will be used in the UK in any event. It is inherent in national planning policy by reference to identified needs for development and by reference to the national significance of minerals, including cement. It therefore follows that so far as cement remains an important construction material, there will be cement production. If cement does not come from Ketton, it will come from somewhere else.

360. Cement is fundamental to the public interest, underpinning essential aspects of everyday life and national infrastructure. The UK cannot currently meet its own cement demand, relying on a small number of domestic plants and facing the risk of increased imports, which would weaken the economy and expose it to international market fluctuations. The proposed quarry extension at Ketton Works would secure a vital, indigenous supply for another 35 years, supporting thousands of local jobs and safeguarding significant contributions to the local economy through business rates. The strategic importance of the site, both nationally and locally, means the public benefit of maintaining cement production is overwhelming—planning permission should be granted to secure the UK's construction future.

361. The scheme aligns with local and national policy, meeting the development plan's expectations for mineral output and delivering multiple public benefits, such as reducing HGV traffic through villages and enhancing biodiversity. While carbon emissions remain a concern, Ketton Works is committed to a robust carbon reduction roadmap, in line with the Climate Change Act 2008, whilst also playing a crucial role in supporting the UK's transition to green infrastructure with the cement it needs. The regulatory framework ensures ongoing environmental improvements, making the adverse effects manageable and justifying the granting of permission by the clear, sustained benefits. Simply put, maintaining and extending Ketton Works is essential for economic resilience and environmental progress—granting permission is both pragmatic and necessary.

362. It therefore remains the case that the benefits of the proposal greatly outweigh any negative effects. The adopted and emerging development plans expect an extension to the quarry and provide policies to facilitate that. Where adverse effects do arise, policy does not provide a moratorium on conflicting development. On balance, this development accords with the development

plan and, therefore, NPPF paragraph 11 requires that planning permission be granted without delay.

APPENDIX 1 – REGULATION 25 REQUEST

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LE15 6HP

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Mr Ian Briggs
Landesign
Unit 14, The Ark Business Centre
Gordon Road
Loughborough
LE11 1JP

Reference: 2024/0066/MIN
Please reply to: Planning Support
Contact Tel: 01572 758 400

Date: 25 June 2025

Dear Mr Briggs,

Site Address: Castle Cement Ltd Ketton Works Ketco Avenue Ketton Rutland PE9 3SX

Proposal:Proposed extensions to Grange Top Quarry, for construction and use of a new access and site access road from the A606, a security gatehouse, bridleway bridge and associated works to facilitate the continued supply of minerals to Ketton Cement Works, the consolidation of existing mineral extraction permissions and a restoration scheme to recreate agricultural land and biodiversity enhancement works.

Request for Further Information under Regulation 25 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017

Following our review of the Environmental Statement submitted with the above planning application and a review of the consultation comments received, we have identified the following areas where further information is required:

- Additional Noise surveys in accordance with the Public Protection consultation comments. This includes an updated dust management plan and noise and air quality reports.
- Submission of a Road Safety Audit Stage 1 in accordance with the Highway Authority's consultation comments.
- Updated Carbon Assessment to take into account the UK Supreme Court decision in *Finch v Surrey County Council*.
- Updated Plans to take into account the changes required following discussions with Anglian Water relating to their underground assets.
- Updated Plans to take into account the retention of the redwood trees in Field 14

We require this additional information to be submitted within six weeks of the date of this letter. Please ensure the information is clearly labelled and cross-referenced to the original ES. This information will be subject to a 40 day public reconsultation.

We would be grateful if you could confirm receipt of this letter and your anticipated submission date for the additional information by 11th July 2025.

Yours sincerely

Andrew Waskett-Burt

Principal Planning Officer

APPENDIX 2 – DUST MANAGEMENT PLAN

Dust Management Plan

Grange Top Quarry

October, 2025

Heidelberg Materials

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Document Control Sheet

Project Information

Title	Grange Top Quarry Dust Management Plan
Job Code	ZCCLK
Report Ref	ZCCLK_DMP_C
Report Type	Dust Management Plan
Client	Landesign Planning and Landscaping Ltd
Client Contact	Ian Briggs
Revision	Final
Status	Final
Date of Issue	29/10/2025

Revision History

Revision	Date	Author	Reviewer	Approver	Status
A	20/07/2023	Max Tuzinkiewicz	Daniel Quinn	Daniel Quinn	Draft
A	31/08/2023	Max Tuzinkiewicz	Daniel Quinn	Daniel Quinn	Final
B	06/09/2023	Max Tuzinkiewicz	Daniel Quinn	Daniel Quinn	Final
C	14/10/2025	John Bruce	Daniel Quinn	Daniel Quinn	Draft
Final	29/10/2025	John Bruce	Daniel Quinn	Daniel Quinn	Final

Distribution

Organisation	Contact	Date of Issue	Copies
Landesign Planning and Landscaping Ltd	Ian Briggs	29/10/2025	01

Disclaimer

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This report may include data obtained from trusted third party consultants/laboratories that have been supplied to us in good faith. Whilst we do everything we can to ensure the quality of all the data we use, we cannot be held responsible for the accuracy or integrity of third party data.

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1 Introduction

1.1 Overview

Heidelberg Materials Ltd. (herein 'HM') operate Grange Top Quarry, located in Ketton approximately 3 km west of Stamford in Lincolnshire, PE9 3SX. The site is located within the administrative boundary of Rutland County Council (RCC). The site comprises a large limestone quarry which feeds extracted material via conveyor and trucks to the adjacent Ketton Cement Works.

Emissions to air from the mineral operations at Grange Top Quarry are covered by Environmental Permits issued by the Environment Agency and planning conditions by RCC. HM are seeking permission to extend operations into Field 14 (on the southern boundary of the current site) and into the field northwest of the current operations. This is to extend the life of the quarry for a 30-year period, with the annual output remaining unchanged at between 1.4 and 1.6 million tonnes per annum (mtpa).

DustScanAQ (herein DS) have been instructed by the client to produce a Dust Management Plan (DMP) to cover the extension at Grange Top Quarry, hereafter referred to as the proposed development.

1.2 Site setting

The site is located to the north of Ketton and is accessed via the cement works located off the Stamford Road (A6121). The current quarry operations are set in a 'horseshoe' like shape around the cement works. Mostly conveyors feed the cement works with extracted material from the quarry, but dumper trucks are also used; for this at the southwest corner of the site a tunnel has been dug under Empingham Road, which also borders the proposed workings of Field 14.

Field 14 is located to the south of the current site and is roughly triangular in shape, whilst the field northwest of current operations is roughly rectangular in shape. It should be noted that the northwest (NW) field proposed extensions topography is on a hill with receptors on Stamford Road on the northern edge of the area at the bottom of the hill with the extension area rising above the receptors. A site location plan is shown in Figure 1.1.

At its closest current operations lie approximately 350 m from the settlement of Ketton, which is mostly residential. Industrial businesses lie on one of the access roads to the quarry.

Ketton Quarries Site of Special Scientific Interest (SSSI), which is contained within the existing operations of the site, was declared due to its geological and biological significance. Ketton Quarries SSSI contains nationally important exposures of Jurassic limestone and the contain some of the largest remaining examples of semi-natural limestone grassland and scrub in Leicestershire.

Shacklewell Hollow SSSI also sits directly on the northwestern border of the existing site boundary and is designated for its biological interest. The site comprises a complex of semi-

natural habitats and contains some of the best examples of species-rich neutral marsh remaining in Leicestershire.

Approximately 350 m at the nearest point southwest of the Field 14 boundary is the North Luffenham Quarry SSSI, a site designated for biological interest. It is a disused limestone quarry which contains a rich flora characteristic of calcareous grassland. The site is one of the best remaining examples of this plant community in Leicestershire, and is representative of grassland developed on the soft limestones of central and eastern England.

All other SSSIs within the surrounding areas of Grange Top Quarry are more than 400 m from the proposed extension areas, hence have been scoped out of the assessment.

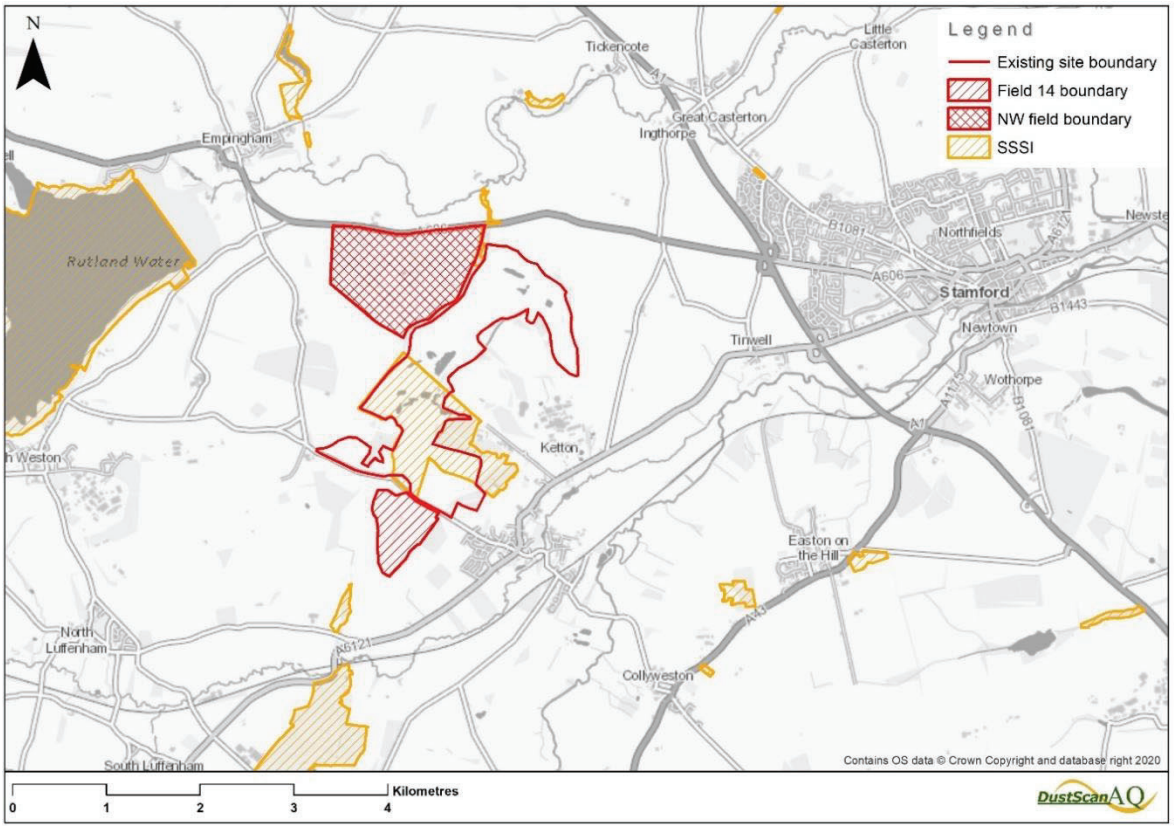

Figure 1.1: Site location

As outlined above, the quarry is set to extract on average between 1.4 – 1.6 mpta with the cement works producing 1 million tonnes of cement per annum.

Rock is extracted by drilling and blasting; blasted rock is then loaded onto mobile processing plant (crushing and screening) which follows the working face before being loaded by face shovel into rigid dump trucks. These dump trucks transport the aggregate to the stockpile area in the centre of the site before being loaded onto the conveyor system which transports the aggregate to the cement works for further processing. The majority of mineral handling and processing is understood to take place at the cement works, where clay and limestone is transported to a crusher building and then is transferred by covered conveyor to a store located at the main plant.

1.3 Proposed development

Full details of the proposed development areas are outlined elsewhere but in summary the total extension area of Field 14 is 38.7 ha and it is set to be worked in five phases, in an anti-clockwise direction. The NW field extension area covers 129.7 ha and will be worked from the southern boundary of the field to the northern boundary in 9 phases.

The extension areas have a slightly different geology. It is understood that Field 14 contains both clay and limestone, whereas NW field only contains limestone. Therefore, both extension areas will be worked concurrently so that the deposits of clay in Field 14 can be used in the production of cement at the existing site. The anticipated time for extraction in both areas will be c.30 years and expected to be required approximately by 2030-32. The output of the quarry is expected to be 1.4 – 1.6 mtpa.

Site preparation will include soil stripping, with soils used in the restoration of previously worked areas and stored in perimeter screening bunds. Excavation will be carried out using front loading shovels, with blasting taking place to extract limestone deposits. Limestone and clay will be loaded onto rigid and articulated dump trucks and taken to the existing cement works for processing. Restoration will be carried out progressively and concurrent with the working phases, although at the end of extraction final restoration would take around 1-2 years.

2 Potential for emissions

2.1 Disamenity dust

'Dust' is generally regarded as particulate matter up to 75 µm (micron) diameter and can be considered in two categories. Fine dust, essentially particles up to 10 µm, is commonly referred to as PM_{10} and is measured to agreed standards and forms part of the Air Quality Objectives (AQO).

Coarser dust (essentially particles greater than 10 µm) is generally regarded as 'disamenity dust' (or 'nuisance') and can be associated with annoyance, although there are no official standards (such as AQO) for dust annoyance[1].

Although it is a widespread environmental phenomenon, dust is also generated through many human activities. This includes at minerals sites and surface mines, and also by heavy industry, waste management, construction and demolition, agriculture (especially arable farming) and road transport.

Dust is generally produced by mechanical action on materials and is carried by moving air when there is sufficient energy in the airstream. More energy is required for dust to become airborne than for it to remain suspended. Dust is removed through gravitational settling (sedimentation), washout (for example during rainfall or by wetting) and by impaction on surfaces (e.g. on vegetative screening). Dust can be re-suspended where conditions allow, such as from bare ground.

Dust emissions from a minerals site, its propagation and potential impacts can be considered in terms of 'source-pathway-receptor' relationships. Dust can arise from a variety of processes and locations within a site and can be difficult to quantify.

The common pathway for dust propagation is by air. Dust propagation depends on particle size, wind energy and disturbance activities. Large dust particles generally travel shorter distances than small particles. It is often considered that particles greater than 30 µm will largely deposit within 100 metres of sources, those between 10 – 30 µm will travel up to 250 – 500 metres and particles less than 10 µm will travel up to 1 km from sources.

For a hard rock quarry, experience indicates that nuisance effects of dust arising from such quarries may extend up to 400 m from the source although, as noted in various guidance documents, residents' concerns are most likely to be experienced within 100 m of the dust source, or sources. The IAQM minerals guidance (2016) states that dust impacts will mainly occur within 400 m of the operation for hard rock quarries.

The Dust Assessment undertaken in 2023 used the procedure set out in the IAQM minerals guidance (2016)[2] to assess potential disamenity dust impacts from the proposed extension. Further details on the assessment, including the results, are set out below in Section 2.5.

[1] The expression 'disamenity dust' has been recently promoted as a suitable expression for 'nuisance' dust, *i.e.* generally visible particulate matter' rather than specifically and in a legal sense to statutory nuisance, as defined in Section 79 of the Environmental Protection Act 1990
[2] Institute of Air Quality Management (2016). Guidance on the Assessment of Mineral Dust Impacts for Planning (v1.1)

2.2 Fine particulate matter (PM_{10} and $PM_{2.5}$)

Particulate matter as a term refers to a mixture of solid particles and liquid droplets suspended in the air. These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, such as dust, dirt, soot or smoke, are large or dark enough to be seen with the naked eye. Others can be so small that they can only be detected using an electron microscope. Fine dust, essentially particles up to 10 microns (µm), is commonly referred to as PM_{10}.

PM_{10} is known to arise from a number of sources such as construction sites, road traffic movement, industrial and agricultural activities. Very fine particles ($PM_{0.1}$ – $PM_{2.5}$) are known to be associated with pollutants such as NO_x and sulphur dioxide (SO_2) emitted from power plants, industrial installations and road transport sources.

$PM_{2.5}$ refers to particles essentially up to 2.5 µm in diameter, and is generally associated with combustion and traffic rather than mineral sources.

From the Dust Assessment carried out prior to this Dust Management Plan, it was found that adverse impacts from fine particulate matter are not expected and the effects of operations on local particulate matter concentrations are expected to be Negligible. In the absence of any site specific or local authority monitoring, modelled DEFRA background concentrations were utilised.

For PM_{10}, predicted background concentrations for 2023 at the proposed development were 14.3 µg/m^3 at Field 14, equivalent to 36 % of the annual mean Air Quality Objective (AQO) (40 µg/m^3) and 14.1 µg/m^3 at NW field, equivalent to 35 % of the AQO. As such, based on the IAQM minerals guidance (2016), given that the predicted background concentrations are less than 17 µg/m^3, there is little risk that on-site operations would lead to an exceedance of the annual mean AQO.

For $PM_{2.5}$ the results found that predicted background concentrations for 2023 were 8.3 µg/m^3 at Field 14, equivalent to 83 % of the annual mean AQO (10 µg/m^3) and 8.2 µg/m^3 at NW field, equivalent to 82 % of the AQO. This suggest that the impact of operations at the proposed development will be not significant and concentrations will remain well below the annual mean AQO, as mineral operations generally produce particles that are sized as PM_{10} and above.

However, as a precautionary measure, PM_{10} and $PM_{2.5}$ monitoring is proposed at key locations on the site boundary towards receptors to alleviate concerns from local residents. Further information is set out in Section 4.3.

2.3 Receptors

Dust receptors can be within or beyond the quarry boundary. Whilst dust generation within a minerals site is primarily of concern to its operator, staff and visitors, dust can propagate beyond the site boundary to affect people and properties beyond, unless adequate control measures are in place. Although the DA concluded there are no other significant existing or planned sources of dust in the vicinity of the site that could cause cumulative dust impacts,

it is important to recognise that there may be other minor dust sources in the vicinity of a quarry (such as road traffic or arable farmland).

The principal dust receptors in the vicinity of the site were also established within the 2023 Dust Assessment and are set out in Table 2.1 and Table 2.2 with their sensitivity to dust effects, their distance to the planned working areas, and the primary direction (or directions) to the receptor from quarry workings.

The locations of the receptors are also mapped in Figure 2.1 and Figure 2.2.

Table 2.1: Receptors in the vicinity of proposed development (Field 14)

No.	Receptor	Sensitivity	Primary direction/s to dust sources (°)	Minimum distance to dust source (m)
R1	Wytchley Road 1	High	285-315	380
R2	Wytchley Road 2	High	285-315	370
R3	Wytchley Road 3	High	285-315	365
R4	Wytchley Road 4	High	285-315	395
R5	Wytchley Road 5	High	285-315	400
R6	Empingham Road 1	High	165-255	115
R7	Empingham Road 2	High	135-195	100
R15	Ketton Quarries	Low	300-45	15
R16	North Luffenham Quarry SSSI	Low	225-255	350

Table 2.2: Receptors in the vicinity of proposed development (NW field)

No.	Receptor	Sensitivity	Primary direction/s to dust sources (°)	Minimum distance to dust source (m)
R8	Stamford Road 1	High	135-255	100
R9	Stamford Road 2	High	135-255	100
R10	Stamford Road 3	High	105-165	130
R11	Stamford Road 4	High	165-255	135
R12	Stamford Road 5	High	135-255	140
R13	Stamford Road 6 (commercial)	Medium	165-255	220

No.	Receptor	Sensitivity	Primary direction/s to dust sources (°)	Minimum distance to dust source (m)
R14	Shacklewell Hollow SSSI	Low	345-195	0*
R15	Ketton Quarries SSSI	Low	165-225	160
*receptor within boundary of NW Field extension				

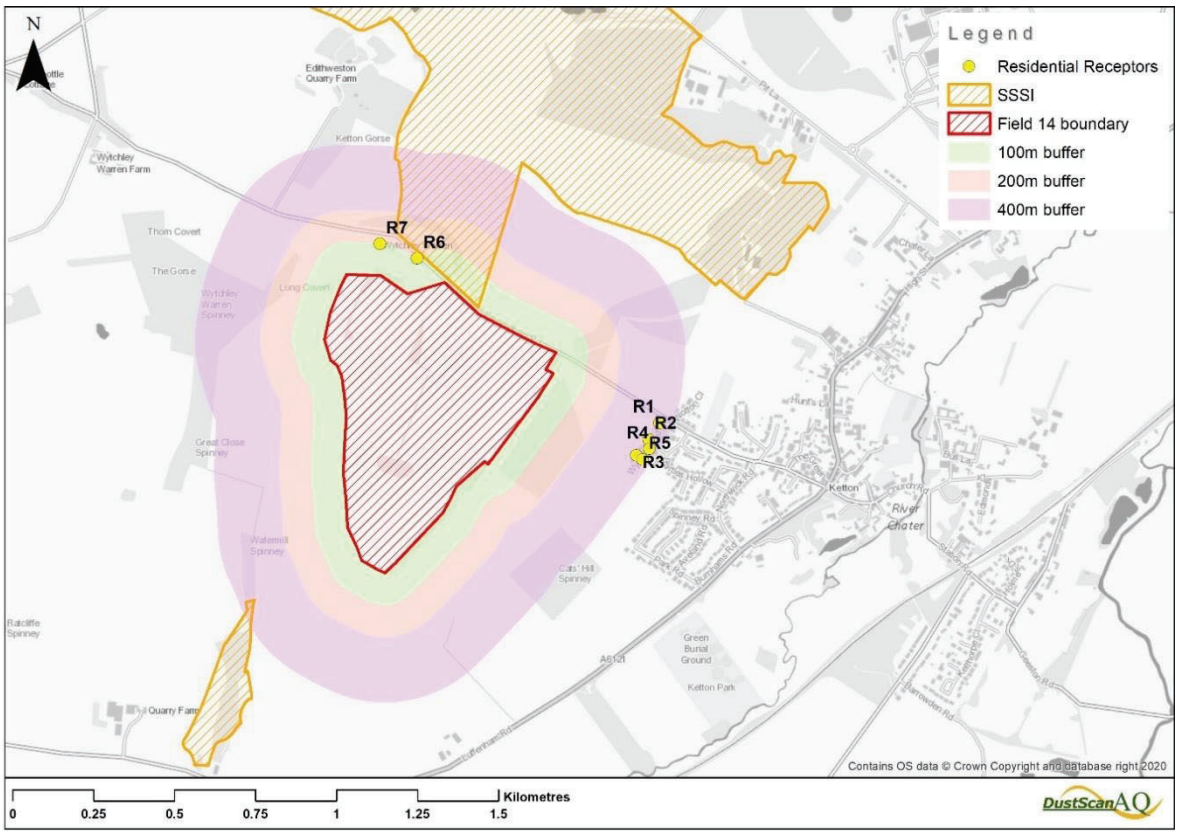

Figure 2.1: Locations of receptors with respect to Field 14 extension

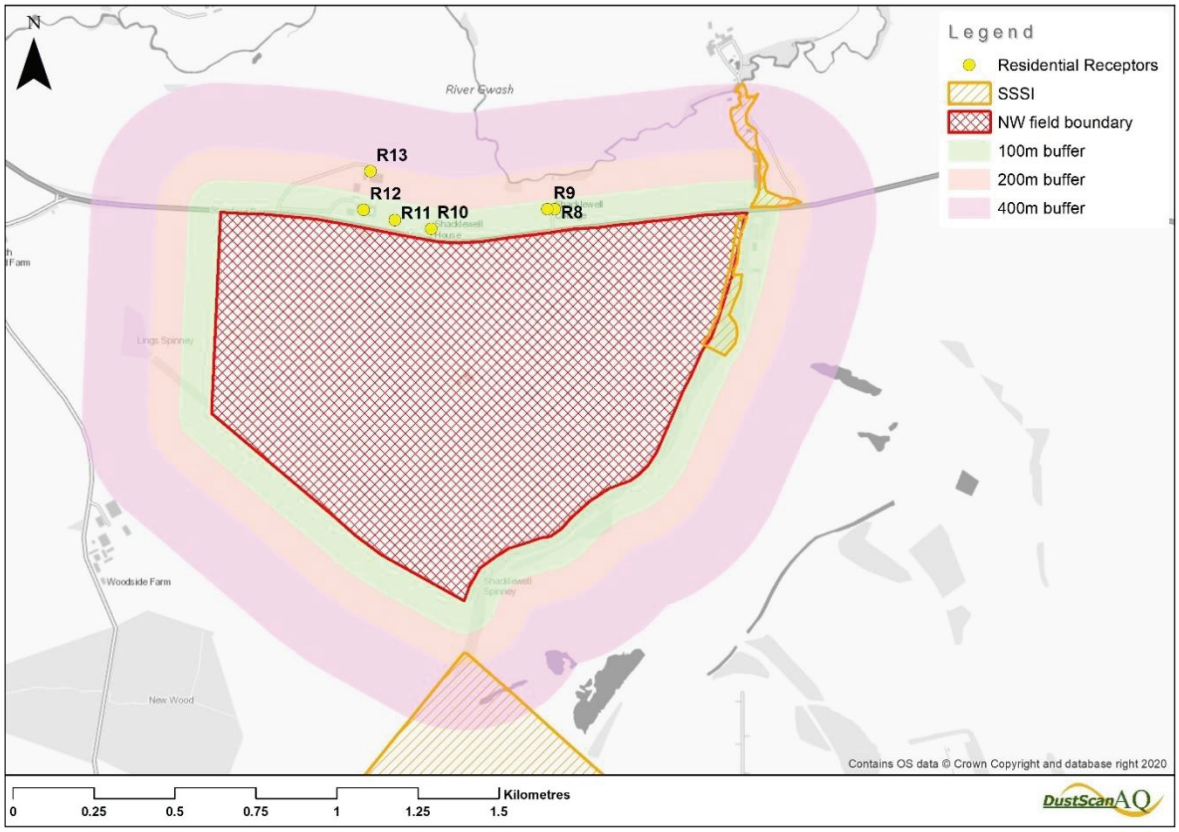

Figure 2.2: Locations of receptors with respect to the NW field extension

2.4 Dust sources

This section of the report sets out the potential sources and processes on site that have been recognised as having the potential to generate significant dust emissions within the 2023 Dust Assessment.

It also includes an analysis of the potential size of each source that was presented within the Dust Assessment, known as Residual Source Emissions.

Potential sources or site activities that may give rise to dust as a result of onsite operations in the extension areas have been split into the following five categories:

- Site preparation and restoration;
- Mineral extraction;
- Materials handling (including conveyors and loadout);
- On-site and off-site transportation; and,
- Wind scouring of exposed surfaces and stockpiles.

Further detail for each category is set out below.

2.4.1 Site preparation and restoration

These works will include the stripping of topsoils and overburden in the working areas using front loading 360° excavators and dump trucks.

Some of this material will be stored in seeded bunds along the borders of the extension areas where dust propagation has the potential to impact sensitive receptors, for example on the northern boundary of NW Field on Stamford Road, and the northwest edge of Field 14. Some material will also be used to directly restore previously worked areas of the extensions. Vegetation will be planted acting as a buffer zone to sensitive receptors on these boundaries.

Generally, removal of topsoils will be carried out during drier conditions due to the nature of the works, however when the soil is too dry dust suppression will be used in the form of mobile water bowsers.

Thus, there is potential for high levels of airborne and wind-blown dust propagation from the preparation and restoration of a minerals site, however these are generally short-term, transient operations that are geographically restricted (i.e. only taking place on one phase at a time). There is also potential for moderate levels of dust emission during soil, storage and replacement.

The residual source emissions from site preparation and restoration were considered to be large for both extension areas.

2.4.2 Mineral extraction

Field 14 contains clay and limestone whilst the NW Field contains only limestone, therefore the extraction process will differ slightly.

In Field 14 the soils and overburden will be stripped, however in the overburden there is understood to be a thin layer of limestone just below the soil, some of this will be extracted and used in concrete production, however most will be treated as overburden and used as a restoration material. Below this layer there is a clay deposit which will be excavated using 360° excavators; approximately half of this will be transferred to processing areas, whilst the other half will be used as a restoration material. After the clay has been extracted from Field 14, a limestone bed sits below.

Drilling and blasting will take place in the extension areas of Field 14 and the NW Field to extract the limestone. As with the majority of hard rock quarries in the UK, blasting is a necessary part of mineral extraction, as there is no other practical form of mechanical breaking available. This presents a high potential for dust emissions, particularly when these operations take place at higher levels of a quarry.

Drilling rigs are expected to be fitted with sufficient dust control measures which could include cyclones and filtration systems. Blasting operations are designed to minimise excessive breakage, fly rock, noise and vibration and this will also reduce dust emissions. At lower levels, therefore, dust emissions from blasting would be short-lived and tend to be retained within the quarry void.

In Field 14 the main limestone bed sits lower due to the clay deposit, therefore emissions from blasting over the boundary will be less likely to leave the site.

However, in the NW Field the topsoil is understood to be thin and the limestone deposit therefore sits higher, meaning emissions may be more likely to leave the site during the

early stages of extraction. However, as extraction progresses, the working face will sit lower in the void and will likely result in less dust emissions.

Given the difference in total area of Field 14 and NW Field, the residual source emissions from mineral extraction in Field 14 were considered to be Medium, whilst in the NW Field they were considered to be Large.

2.4.3 Mineral handling (including conveyors and loadout)

Mineral handling is expected to be similar to that carried out in the existing operations, with blasted rock loaded by an excavator into articulated dump trucks, which transport the aggregate to the conveyor belt (within the existing site boundary), which then feeds into the cement works.

Loading of the blasted rock may result in localised dust emissions but these can often be retained within the quarry void, especially when working at lower levels. Consequently, as with blasting, there would be an increased risk of dust emissions over the site boundary when extracting at the upper levels.

Existing transfer points are generally shrouded and fitted with water sprays to contain and suppress dust. All loadout points (HGV) make use of dedicated dust suppression systems to reduce the potential for dust emissions.

Consequently, the residual dust emissions from mineral handling were considered to be Medium at for Field 14 and Large for the NW Field, primarily due to the larger area of the NW Field.

2.4.4 On and off-site transportation

On-site and off-site transportation using dump trucks will take place in the extension areas of Field 14 and the NW Field.

There is a high risk of dust emissions from transport on unpaved roads unless appropriate mitigation measures are applied. Dust may be generated from downward-blowing exhausts and cooling fans as well as air turbulence caused by vehicle movements, so only mobile plant that avoids such risks with upward or sideways exhausts should be used.

Site haulage can be a significant source of dust, particularly over longer haul distances when speeds tend to be higher and there is an added requirement to maintain a smooth well-drained surface. The majority of haul roads on site will be located well away from site boundaries so the likelihood of dust generated by on-site transportation travelling off-site from these areas will be lessened on account of the horizontal distance to the quarry rim.

With regard to off-site transport, vehicles leaving the site will be sheeted as appropriate and all vehicles should be checked for loose deposits that could fall onto the public highway. Any spillages that could track out onto the public highways will be cleared immediately.

If permitted, a new access road will be implemented in the NW field which will be tarmacked and link onto the Stamford Road on the eastern side of the extension area, with all traffic leaving site via this route. This road will be sprayed and swept throughout operations.

The residual source emissions from on-site and off-site transportation after mitigation is applied were therefore considered to be Medium for both Field 14 and NW Field.

2.4.5 Wind scouring of exposed surfaces and stockpiles

As a general rule, there is a moderate risk of wind-blown dust propagation from dry surface layers of stripped surfaces, freshly constructed bunds prior to seeding and from bare ground.

Stockpiles of extracted and processed materials will be kept within the site and away from receptors.

During dry windy conditions, visible wind-blown dust may be raised from large areas of open or bare ground, including stockpiles and other unsurfaced areas particularly where the materials are loose or have been disturbed by traffic or other operations.

With these points in mind, the residual source emissions for wind-whip from bare ground and exposed surfaces after mitigation is applied were considered to be large in both Field 14 and NW Field.

2.4.6 Summary of potential source emissions

The estimated residual source emissions from the 2023 Dust Assessment are therefore summarised below.

Table 2.3: Summary of residual source emissions, Grange Top Quarry extensions

Activity	Residual Source Emission	
	Field 14	NW Field
Site preparation and restoration	Large	Large
Mineral extraction	Medium	Large
On-site and off-site transportation	Medium	Medium
Wind scouring of exposed surfaces and stockpiles.	Large	Large
Mineral handling (including conveyors and loadout)	Medium	Large

2.5 Summary of Dust Assessment results

Full results from the 2023 Dust Assessment are set out within the original document (Section 5.2), but it can be summarised that the vast majority of receptors were predicted to experience either Negligible or Slight Adverse Effects from activities related to works at Field 14, with only receptor R6 (Empingham Road 1) predicted to experience up to Moderate Adverse Effects during Phase 1 only.

Activities within the NW field will also generate mainly Slight Adverse Effects, although up to Moderate Adverse Effects were predicted for two receptors (R8 - Stamford Road 1 and R9 - Stamford Road 2) during Phase 8 activities and at three receptors (R10 - Stamford Road 3, R11 - Stamford Road 4, and R12 - Stamford Road 5) during Phase 9 activities.

To highlight the areas of most concern, colour-coded phase maps are presented in Figure 2.3 and Figure 2.4, with the maximum magnitude of dust effect presented for each phase.

However, it is important to note for example that whilst Phase 1 was assessed to have up to a Moderate Adverse Effects at one receptor (R6) from *Site preparation/restoration* and *Wind scouring of exposed surfaces and stockpiles*, the majority of Phase 1 emissions at the majority of receptors were assessed to have a Negligible or Slight Adverse Effects, including at all receptors from mineral extraction, mineral processing, on-site transportation and mineral handling (including conveyors and loadout).

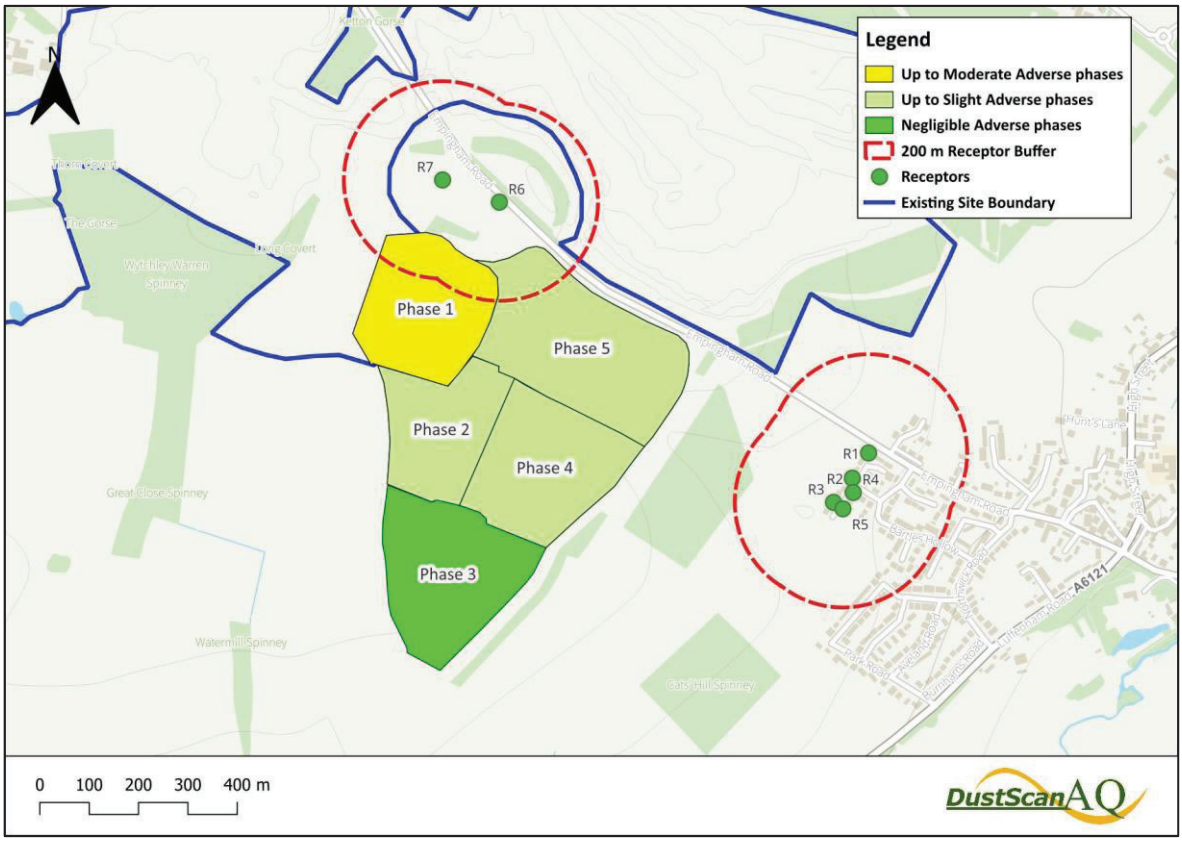

Figure 2.3: Maximum magnitude of dust effects from each phase at any given receptor for Field 14

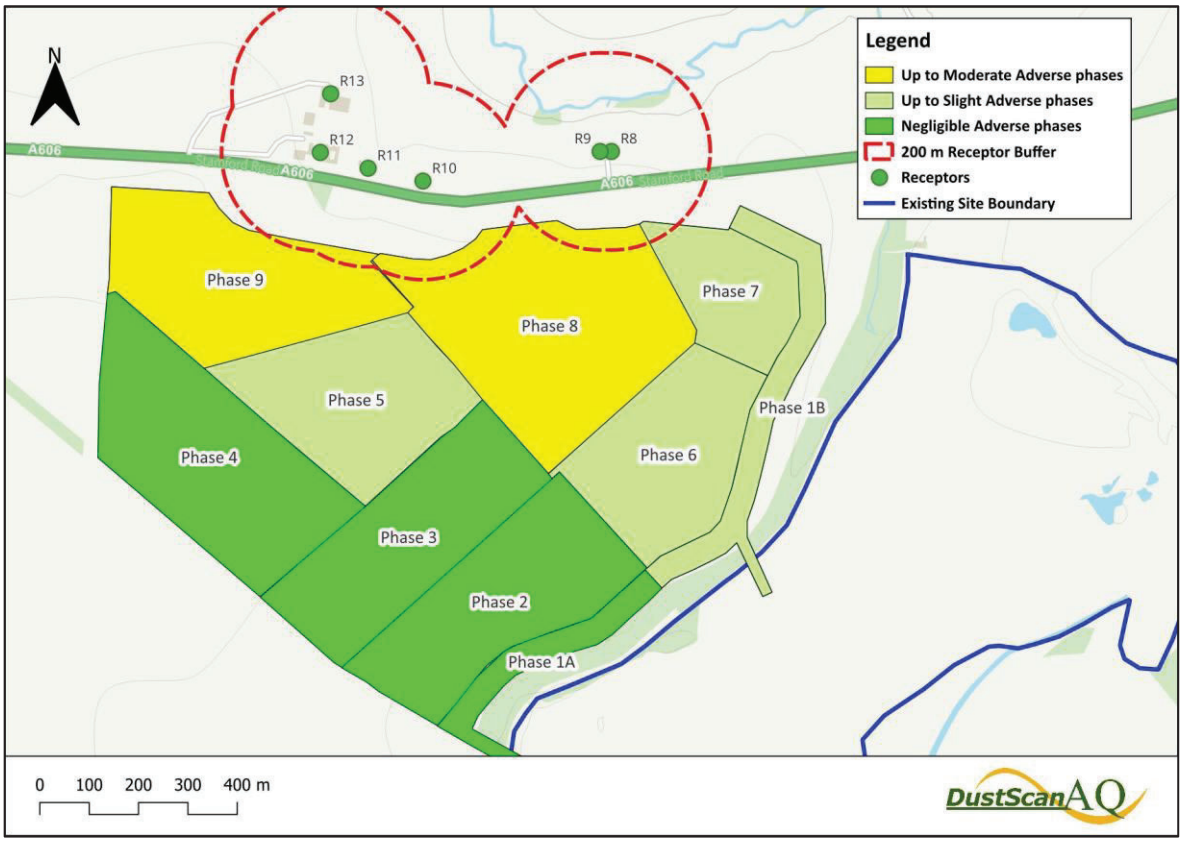

Figure 2.4: Maximum magnitude of dust effects from each phase at any given receptor for the NW Field

Examination of Figure 2.3 and Figure 2.4 clearly demonstrates that the highest risk of dust impacts (up to Moderate Adverse Effects) is exclusively for phases that fall within 200 m of nearby receptors. For this reason, a 200 m buffer to receptors has also been included, which can be used to visualise the internal phase areas that present the highest risk of dust impacts. It should also be noted that Phase 5 in Field 14 and Phase 7 in the NW Field are also within 200 m of at least one receptor, but due to the comparative rarity of south-easterly winds (see Figure 3.1), there is a lower risk of dust impacts.

These site boundary areas within 200 m of receptors should therefore be prioritised for dust monitoring locations, as well as the focus of any additional dust mitigation measures when any operations are working nearby.

3 Dust management

Standard good practice on dust control is set out in various publications, including PGN 3/08(12)[3] which sets out at Section 4 a summary of best available techniques for dust control at minerals sites. In accordance with good practice guidance, potentially unacceptable dust emissions from minerals sites can be addressed through a Dust Management Plan[4].

It should be noted that many of the tables, figures and data presented in this report are based upon the 2023 Dust Assessment produced for Grange Top Quarry by DustScanAQ. This DMP outlines control measures for the existing site and proposed extension.

3.1 General requirements

Unacceptable dust emissions can be mitigated by ensuring that routine checks of plant and machinery are carried out and that regular staff training is provided.

All activities with the potential to cause either airborne or wind-blown dust emissions should be monitored appropriately. This should include a visual assessment of any potential impacts at downwind receptors (see Section 4.1 for further details).

Should visible dust be generated, the source/s of the dust should be identified, and the necessary corrective action should be taken. Each event, its cause and the action taken should be recorded in the site logbook.

If necessary, to avoid disamenity impacts at off-site receptors, site operations causing visible dust emissions across the site boundary towards a sensitive receptor should be reduced or suspended until the emissions can be controlled.

Site personnel should be empowered to take appropriate action whenever visible dust emissions are observed, or appear likely to occur, as a result of any operation or process on the site.

3.2 Weather conditions and meteorological data

Meteorological conditions can have a significant effect on the potential for dust propagation from a minerals site. Of particular importance are wind speed, wind direction and precipitation.

Dust can be carried from a source towards receptors (such as nearby homes, other businesses and designated ecological sites) according to the strength and direction of wind. Precipitation is recognised to suppress dust and 0.2 mm of antecedent rainfall is considered sufficient to suppress windblown dust for a number of hours.

[3] Process Guidance Note (PGN) 3/08 (12) (2012) *Statutory guidance for quarry processes* (Defra)
[4] AEA Technology (2011) *Good practice guide: control and measurement of nuisance dust and PM_{10} from the extractive industries*

A wind rose showing the 'dry' hours[5] in 2017 - 2021 for Wittering, approximately 5 km to the southeast of the site, is presented in Figure 3.1. This demonstrates that south-westerly winds are prevailing in this area, although winds from the west are also frequent.

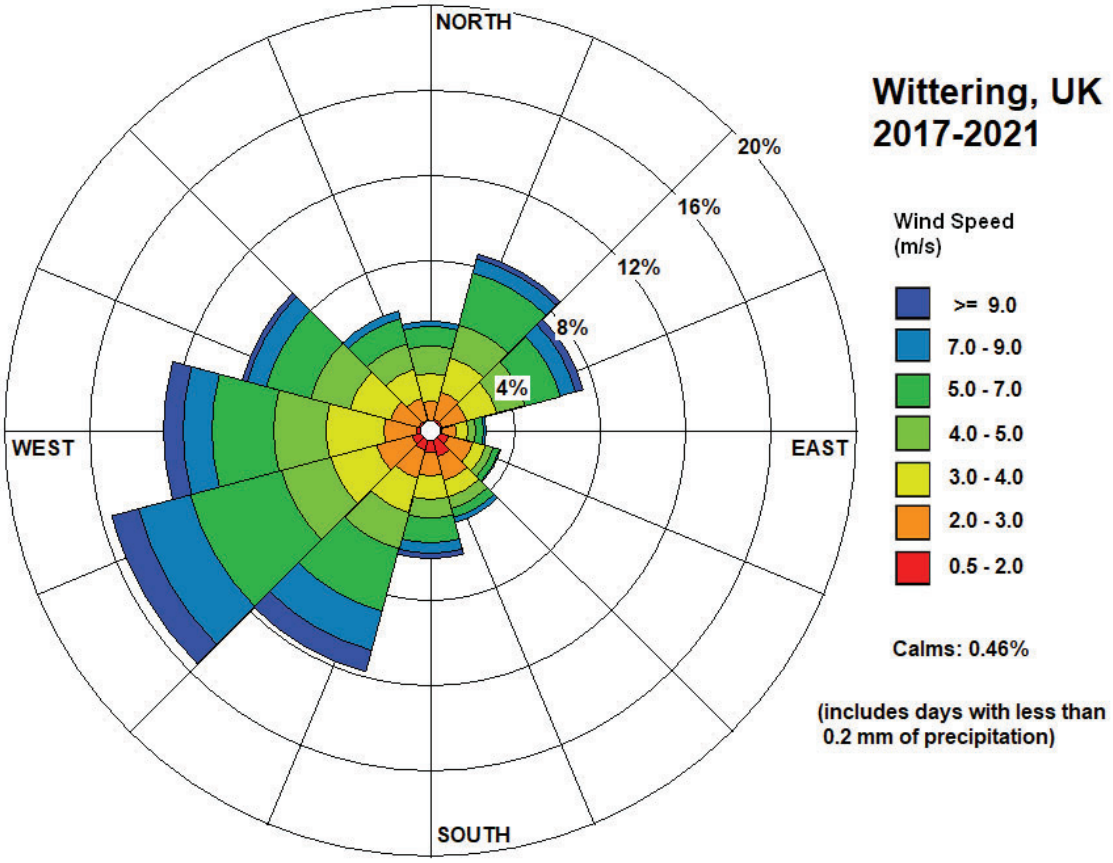

Figure 3.1: Wind rose, dry hour (five year average), Wittering 2017 – 2021

The site has an existing onsite weather station installed on top of the old quarry offices to the north of Ketton village. A trigger system should be adopted to identify those weather conditions when there is an increased or high risk of wind-blown dust. Suggested weather trigger levels are detailed in Table 3.1.

Table 3.1: Weather conditions and corresponding dust 'risk' conditions

Wind speed		Precipitation		
m/s	Beaufort Scale	Dry	Showers	Heavy Rain
> 6	4+ Dust and loose paper raised. Small branches begin to move.	Red	Amber	Green

[5] 'Dry' hours are those with less than 0.2 mm liquid equivalent precipitation and are associated with an increased risk of dust propagation

2 – 6	2 – 3 Wind felt on exposed skin. Leaves rustle. Wind vanes begin to move.	**Amber**	**Green**	**Green**
< 2	0 – 1 Smoke drift indicates wind direction. Leaves and win vanes are stationary.	**Green**	**Green**	**Green**

Interpretation of the weather trigger levels should be on the basis of:

- Red: All exposed areas of loose bare ground and stockpiles will be inspected and treated as necessary in accordance with the provisions in Section 3.5.5. Real-time monitoring results should be checked regularly to ensure any dust emissions are not blown across the site boundary towards off-site receptors;
- Amber: Loose bare ground and stockpiles within 100 m of the site boundary will be inspected and treated as necessary in accordance with the provisions in Section 3.5.5.; and
- Green: no action necessary.

During dry windy weather, i.e. 'red' conditions as defined in Table 3.1, if any operations are identified as causing or likely to cause visible emissions across the site boundaries, or if abnormal emissions are observed within the site, the Site Manager should immediately modify, reduce or suspend those operations until either effective remedial actions can be taken or the weather conditions giving rise to the emissions have moderated.

For example, during extended 'red' conditions as defined above, speed limits should be reduced further, in particular within 250 m of sensitive residential receptors, and active dust suppression should be enabled where necessary, such as the use of sprinkler systems and water bowsers. Particular attention should be paid towards any real-time monitoring results on the site boundary to ensure any significant emissions are not blown towards off-site receptors.

3.3 Maintenance

Effective control of airborne dust emissions requires the maintenance and proper operation of all plant and equipment, including fixed and mobile dust extraction and suppression equipment.

A programme of planned maintenance and servicing should be carried out on all plant and equipment in accordance with the manufacturers' recommendations to ensure that it operates at optimum efficiency. Stocks of essential spares and consumable items should be held at the site or kept readily available for use at short notice.

Particular attention should be paid in ensuring that the wheel washing facilities are fully operational at all times and regularly maintained.

Any malfunction or breakdown leading to abnormal emissions should be dealt with promptly and operations will be modified or suspended until normal working can be restored. All such malfunctions and the actions taken will be recorded in the site logbook.

3.4 Site management

The Site Manager should exercise, either personally or by delegation to suitably trained and responsible staff, day-to-day control of the site. They will be responsible for the satisfactory working of the whole site and for ensuring full compliance with the DMP.

Staff at all levels should receive the necessary training and instruction in their duties relating to all operations and the potential sources of dust emissions. Particular emphasis should be given to plant and equipment malfunctions and abnormal conditions.

Roles and responsibilities regarding dust management should be clearly defined for all staff, with a clearly defined training programme and materials, including this DMP. A company wide electronic training log is kept for all relevant staff, which should include include staff competencies to ensure sufficient coverage, and which should be made available upon request.

The Site Manager should ensure that customers and suppliers are also aware of the need to comply with the provisions of this plan so far as they are relevant to their activities on site. Specifically, an information sheet summarising the requirements in respect of road transport should be handed to drivers employed by external hauliers. The drivers should be asked to sign for the sheet, acknowledging that they have read and understood the requirements.

Any member of staff who fails to comply with the provisions of this document should be re-trained as necessary and may also be subject to disciplinary action. External hauliers failing to observe the requirements in respect of vehicle operations will be reminded of their obligations and persistent offenders may be asked to leave the site.

3.5 Mitigation measures

The suggested mitigation measures are based on the results of the assessment and are drawn from experience and best practice guidance. These measures have also been based on those listed in the current planning permission documents (see Appendix C).

3.5.1 Site preparation and restoration

Soil storage bunds should be stabilised by seeding and maintained appropriately.

Unacceptable dust emissions from soil and overburden stripping, storage and reinstatement can be controlled by minimising working of material in very dry, windy conditions, by reducing drop heights at material transfer points and controlling vehicle speeds. This is especially important during initial formation of screening bunds surrounding the extraction phases. Operations should be suspended when wind conditions would be likely to result in visible dust being carried towards off-site receptors.

Additional control measures, such as the use of water sprays or wetting down with a bowser, should be considered where there is a risk of wind-blow across the site boundary towards off-site receptors.

Some of the topsoil and overburden material will be stored in seeded bunds along the borders of the extension areas where dust propagation may impact sensitive receptors, for

example on the northern boundary of NW Field on Stamford Road, and the northwest edge of Field 14. Some material will also be used to directly restore previously worked areas of the extensions. Vegetation will also be planted acting as a buffer zone to sensitive receptors on these boundaries.

Generally, removal of topsoils will be carried out during drier conditions due to the nature of the works, however when the soil is too dry dust suppression will be used in the form of mobile water bowsers.

Mitigation measures relating to site preparation and restoration activities are summarised in Table 3.2.

Table 3.2: Suggested mitigation measures relating to site preparation and restoration

Receptor	Effect	Mitigation Measure	Residual Effect
All receptors within 400 m of the proposed development	Dust soiling leading to disamenity, and the potential increase in particulate matter (PM_{10} and $PM_{2.5}$)	• Minimise working material in dry windy conditions • Reduce drop heights at transfer points • Control vehicle speeds • Suspend operations when wind conditions would be likely to result in visible dust emissions towards offsite receptors	Negligible

3.5.2 Mineral extraction

There is a low risk of airborne dust propagation emissions from extraction by hydraulic excavator due to the cohesive nature of clay, but additional control measures (such as wetting down with a water bowser) should be considered if there is a risk of visible dust from the extraction area being blown over the site boundary towards off-site receptors.

There is more risk of airborne dust propagation emission from blasting of limestone. It might be necessary to restrict extraction operations in areas where blasting will occur during dry and windy conditions, as there is an elevated risk of dust propagation over the site boundary towards sensitive receptors.

The Quarry Manager shall determine whether extraction shall be restricted according to operational and environmental conditions pertaining at the time. As a guide, blasting at may be restricted in 'Red' conditions as shown in Table 3.1.

The drilling rig on site is fitted with dust control measures.

Mitigation measures relating to mineral extraction are outlined in Table 3.3.

Table 3.3: Suggested mitigation measures relating to mineral extraction and processing

Receptor	Effect	Mitigation Measure	Residual Effect
All receptors within 400 m of the proposed development	Dust soiling leading to disamenity, and the potential increase in particulate matter (PM_{10} and $PM_{2.5}$)	• Wet minerals down with a water bowser if dry • Control vehicle speeds • Suspend operations when dry and windy conditions would be likely to result in visible dust emissions towards offsite receptors	Negligible

3.5.3 Mineral handling (including conveyors and loadout)

Dust can arise during windy conditions if extracted or stockpiled materials are allowed to dry out. Water sprays should be used to ensure that exposed surfaces and the material stockpiles within the site are kept damp.

Additional control measures should be put into place if there is a risk of visible dust from the plant site being blown over the site boundary towards off-site receptors. Enclosure of specific dust-generating processes could also be considered.

The external conveyors are fitted with dust covers and wind boards.

Transfer points are generally shrouded and fitted with water sprays to contain and suppress dust.

All loadout points (HGV) make use of dedicated dust suppression systems to reduce the potential for dust emissions.

When handling materials, ensure that drop heights are kept to a minimum.

The fixed plant, including the primary crusher with the crusher building, is fitted with dust extraction at various transfer points, which are regularly monitored and maintained.

Table 3.4: Suggested mitigation measures relating to mineral handling (including conveyors and loadout)

Receptor	Effect	Mitigation Measure	Residual Effect
All receptors within 400 m of the proposed development	Dust soiling leading to disamenity, and the potential increase in particulate matter (PM_{10} and $PM_{2.5}$)	• Wet minerals down with a water bowser if dry • Control vehicle speeds • Suspend operations when wind conditions	Negligible

Receptor	Effect	Mitigation Measure	Residual Effect
		would be likely to result in visible dust emissions towards offsite receptors • Reduce drop heights at transfer points • Inspect conveyors regularly • Fit shrouding to transfer points where visible dust emissions may occur • Fit return belt cleaners on conveyors • Ensure dust suppression is active on internal processes such as the crushing plant	

3.5.4 On-site and off-site transportation

To avoid dust generation relating to vehicle movements, mobile plant with upward or sideways exhausts should be used. Site haulage should keep to designated haul routes.

Unmade access roads should be kept in good repair and wetted as required with a water bowser or sprinkler system. Vehicle speed limits should be kept to a minimum (ideally 10 mph, the current site speed limit) but would be determined according to the site and weather conditions pertaining at the time. Drop heights should always kept to a minimum to ensure unnecessary dust generation.

Off-site transportation has the potential to carry dust beyond the site boundary and have adverse effects on nearby receptors. The potential for dust nuisance to arise from this activity will be significantly higher during dry and windy periods. All vehicles leaving the quarry area must pass through the wheel wash and be visually inspected after passing through for loose deposits that could fall onto the public highway. Vehicles should pass through the wheel wash a second time should they not be deemed clean enough after visual inspection. Any spillages that could track out onto the public highways must be cleared immediately.

If permitted, a new access road will be implemented in the NW field which will be tarmacked and link onto the Stamford Road on the eastern side of the extension area. All cement delivery traffic will leave site via this route. This road will be sprayed and swept throughout operations.

In extreme circumstances where there are particularly dry and windy periods that have increased the amount of dust generated from off-site transportation, road sweepers can be deployed on the public highway to mitigate this.

Table 3.5: Suggested mitigation measures relating to on-site and off-site transportation

Receptor	Effect	Mitigation Measure	Residual Effect
All receptors within 400 m of the proposed development	Dust soiling leading to disamenity, and the potential increase in particulate matter (PM_{10} and $PM_{2.5}$)	• Mobile plant with upward or sideways exhausts should be used • Vehicles should keep to designated haul routes • Unmade access roads should be kept in good repair and wetted as required • Control vehicle speeds • Install and make use of wheel wash for egressing vehicles • Deploy a road sweeper on the public highway as necessary, and in the event of any spillage.	Negligible

3.5.5 Wind scouring of exposed surfaces and stockpiles

The effects of wind-blow across stripped surfaces, unpaved vehicle circulation areas, stockpiles, and other areas of bare ground can be minimised by ensuring that loose materials are removed or treated as necessary. A high standard of housekeeping can also help to minimise the effect of wind scouring. Additionally, dust emissions from exposed surfaces such as internal haul routes and stockpiles can be minimised by wetting down with a water bowser as necessary, especially in periods of dry, windy weather. Extracted minerals may also be wetted down to reduce the risk of wind-blow from exposed surfaces.

Stockpiles of extracted and processed materials should be kept within the site and away from receptors.

Table 3.6: Suggested mitigation measures relating to wind scouring of exposed surfaces and stockpiles

Receptor	Effect	Mitigation Measure	Residual Effect
All receptors within 400 m of the proposed development	Dust soiling leading to disamenity, and the potential increase in particulate matter (PM_{10} and $PM_{2.5}$)	• Keep stockpiles tidy and storage areas tidy • Wet down storage areas and yards to prevent dust emissions • Wet down extracted materials where necessary • Control vehicle speeds	Negligible

3.5.6 Other

General matters and the management of the site can affect the likelihood of significant dust emissions. These include:

- the use of clean water for dust suppression to avoid re-circulating fine material;
- high standards of housekeeping to minimise track-out and wind-blown dust;
- the planting and maintenance of healthy perimeter vegetation; and
- effective staff training in respect of the causes and prevention of dust.

The water supply to any dust suppression installations will be protected against frost to ensure its availability at all times.

4 Monitoring

Dust emissions at Grange Top Quarry will be monitored routinely by visual means as well as using both 'passive' (unpowered) and 'active' (powered) dust monitoring equipment.

4.1 Visual

All activities with the potential to cause either airborne or wind-blown dust emissions should be monitored appropriately. On operational days this should include a daily visual assessment of any potential dust emissions and impacts along the site boundary, particularly when working close to sensitive receptors.

Activities with the potential to cause dust emissions, as detailed in Section 2.4, should be monitored at the start-up of daily operations and again in the early afternoon. This will include a visual assessment of any potential impacts at downwind receptors.

All observations and findings, including wind and other weather conditions, will be recorded in the site logbook. Should visible dust be generated, the Quarry Manager will act promptly to identify the source(s) of the dust and take the necessary corrective action.

It is worth noting that the site location is also adjacent to arable farmland in many directions, therefore visible dust present on-site may not always be from an on-site source. Certain times of the year, notably harvest season, may generate significant amounts of dust, particularly during dry periods. Although these activities are generally very short-lived, they could result in propagation of dust to within the site boundary.

Each event, its cause and the action taken will be recorded in the site logbook. If necessary to avoid nuisance, the Quarry Manager will instruct the reduction or suspension of any operation or process causing visible dust emissions across the site boundary towards a sensitive receptor until the emissions can be controlled.

Site personnel should inform the Quarry Manager whenever visible dust emissions are observed, or appear likely to occur, as a result of any operation or process.

The reporting and response mechanisms for visual monitoring are provided in Section 7 below.

4.2 Directional and deposited (passive) dust monitoring

4.2.1 Existing monitoring results

Directional and depositional dust has been monitored at various locations around the existing operations of the quarry and cement operations since 2003.

Due to a change in operator, including a re-orientation of the directional monitors in January 2023, monitoring data from February 2023 to March 2025 is presented below. Figure 4.1 presents the current dust monitoring locations – all five locations use Frisbee samples to monitor for dust deposition (in mg/m^2/day) and three locations use the British Standard (BS) 1747-5 directional dust monitors.

The BS directional dust monitors have four slotted sampling tubes with collection pots set at right angles from each other, with the sampling slot of each tube lined up with the four ordinate points of the compass. Results are expressed as mg/day per direction, but should not be compared with those from a directional gauge. Research has also shown that the BS gauge has limited collection efficiency[6].

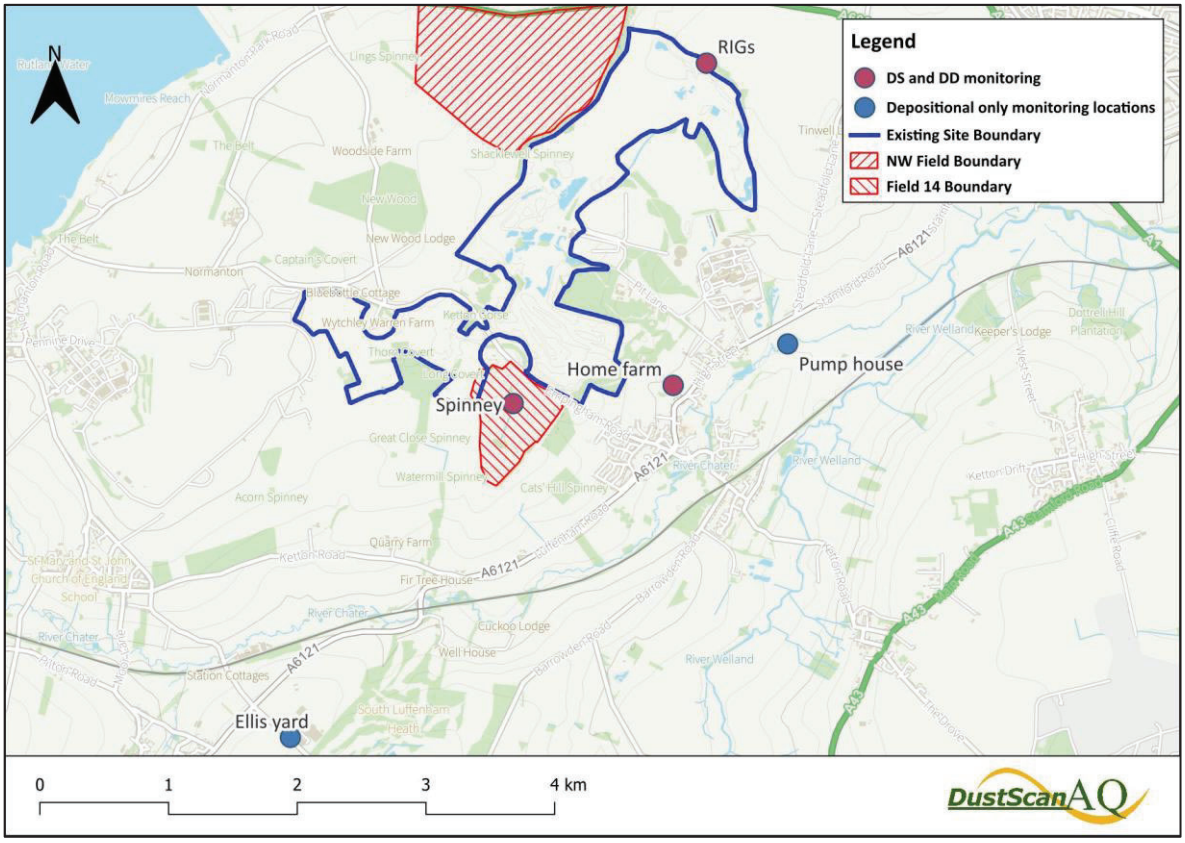

Figure 4.1: Dust monitoring locations

4.2.1.1 Dust deposition results

Median dust deposition rates of dried solids expressed in terms of mg/m^2/day are summarised below in Table 4.1. Median deposition rates for this period of monitoring at all locations is within the baseline estimates of a rural area and the custom and practise threshold.

Table 4.1: Depositional dust data, February 2023 – March 2025

Monitoring location	Pump house	Home Farm	RIGs [7]	Spinney Empingham road	Ellis Lorry Yard
Median deposition rate (mg/m^2/day)	13	1	9	15	18

[6] Hall, D. J., Upton, S. L. and Marsland, G. W. (1993). Improvements in dust gauge design. In: Measurement of Airborne Pollutants. Ed: Couling, S. Butterworth Heinemann, in association with Warren Spring Laboratory, Stevenage
[7] Region of Geographical Significance

Monitoring location	Pump house	Home Farm	RIGs [7]	Spinney Empingham road	Ellis Lorry Yard
Count of periods >200 mg/m^2/day	0/27 (0%)	0/27 (0%)	0/27 (0%)	1/26 (3.8%)	1/27 (3.7%)

By comparison, the following are published estimates for dust deposition rates in different environments[8]:

- Rural areas: 10 to 50 mg/m^2/day;
- Suburban areas: 30 to 80 mg/m^2/day; and
- Town centre or industrial areas: 80 to 160 mg/m^2/day.

The immediate site setting is rural thus the existing dust deposition rates are consistent with results published elsewhere.

For additional reference and comparison, Environment Agency M17[9] guidance suggests a 'custom and practice' threshold of 200 mg/m^2/day where complaints may be likely and as a means of assessing site performance in the absence of any recognised limits values for visible deposited dust. The average dust deposition rates recorded at the above locations are well within this 'custom and practice' threshold.

4.2.1.2 Directional dust results

Average directional dust results are presented in Figure 4.2 and demonstrate that directional dust movements are not exclusively from towards the existing site, with the highest average dust collected from the south facing tube at Home Farm, which points towards the village of Ketton and away from the site.

Results at the closest monitor to the existing site (RIGs) are also by far the lowest of the three, despite monitoring ongoing on the edge of the active site boundary and downwind of most site activities.

Table 4.2: Directional dust data (mg/day)

Direction	Home Farm	RIGs[10]	Spinney Empingham road
North	34	16	23
East	38	18	20
South	83	22	43
West	72	37	53

[8] Waller Associates for DoE (1991) *Environmental Effects of Surface Mineral Workings*
[9] Environment Agency (2013) *Monitoring Particulate Matter in Ambient Air around Waste Facilities*
[10] Region of Geographical Significance (RIGs)

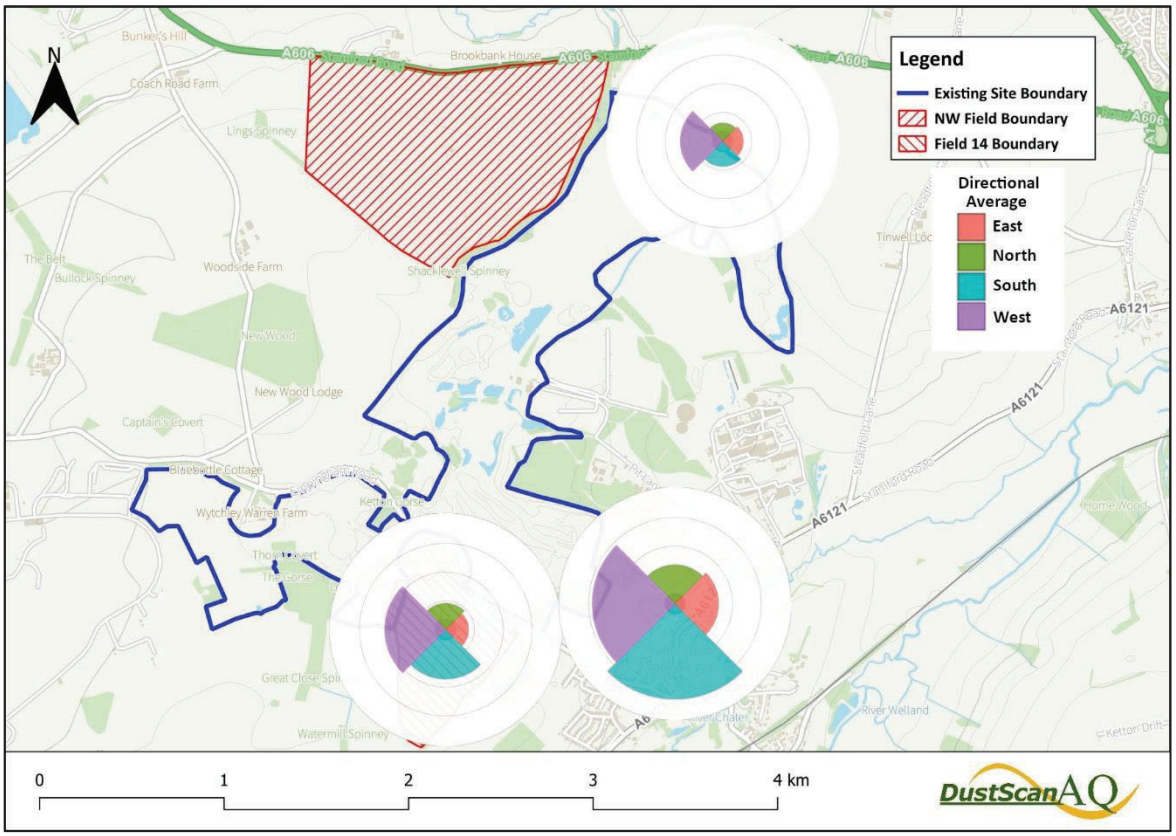

Figure 4.2: Directional dust averages

4.2.2 Future dust monitoring

It is clear that existing monitoring has demonstrated no significant dust issues in the vicinity of the current site.

Regardless, given the results of the Dust Assessment set out in Section 2.5, and considering that activities are moving closer to receptors to the north and south, suggested dust monitoring locations for future phases are shown below in Figure 4.3 and Figure 4.4.

A suggested dust monitoring procedure is given below in Appendix A.

When the proposed development commences, results from the dust monitoring should be reviewed regularly with respect to ongoing working areas. A recommended schedule for the monitoring is set out below in Table 4.3.

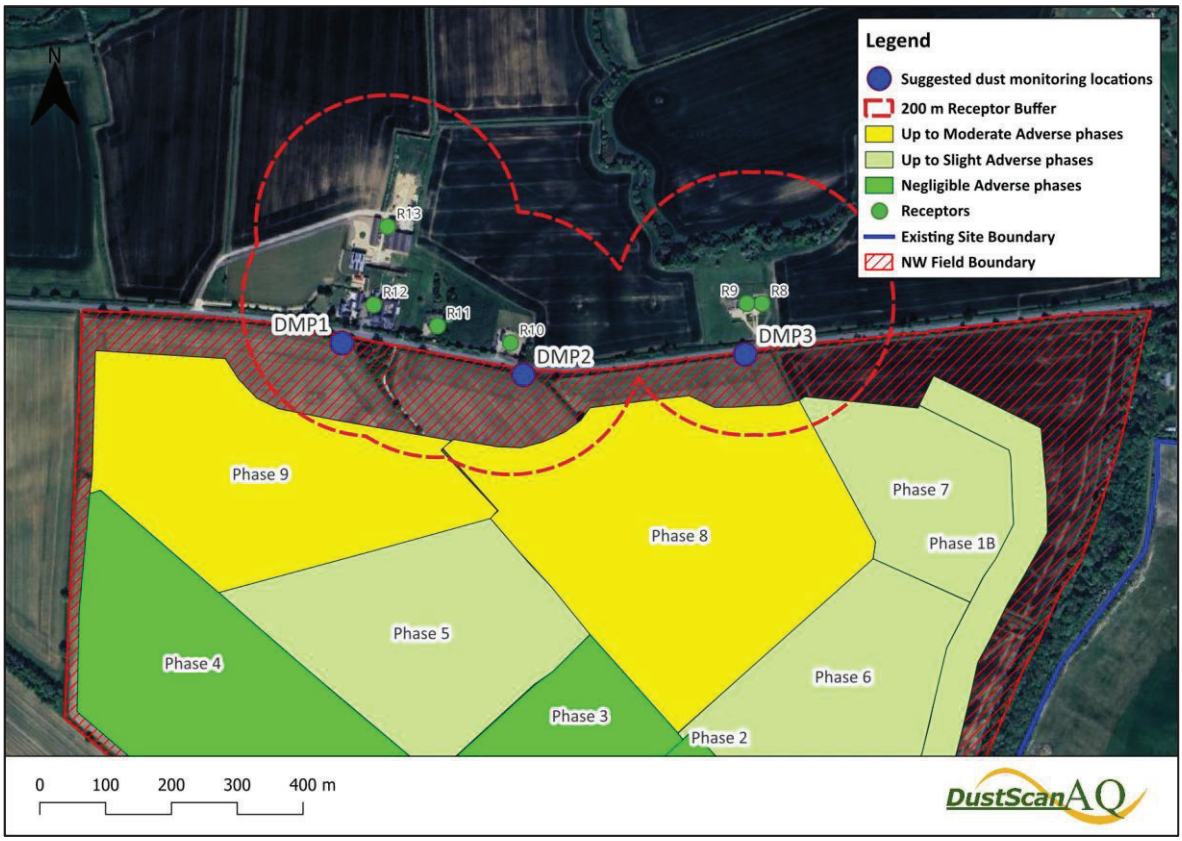

Figure 4.3: Suggested dust monitoring locations for the NW Field

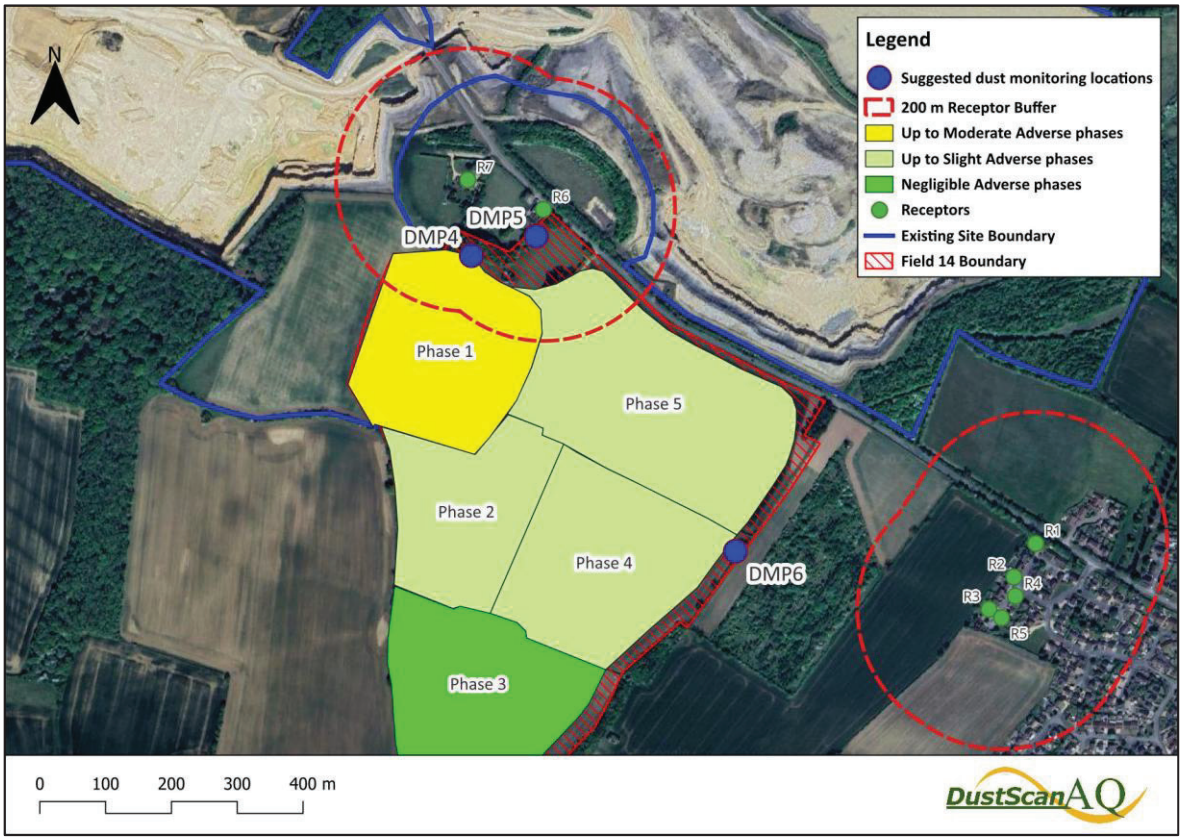

Figure 4.4: Suggested dust monitoring locations for Field 14

Table 4.3: Suggested timeline of dust monitoring locations for each phase

Phase	Active dust monitoring locations
NW Field – Phases 1 - 4	No monitoring required
NW Field – Phase 5	DMP2
NW Field – Phase 6	DMP3
NW Field – Phase 7	DMP3
NW Field – Phase 8	DMP2 and DMP3
NW Field – Phase 9	DMP1 and DMP2
Field 14 – Phase 1	DMP4
Field 14 – Phase 2	DMP4
Field 14 – Phase 3	No monitoring required
Field 14 – Phase 4	DMP6
Field 14 – Phase 5	DMP5

4.3 Particulate matter monitoring

As noted above, the Dust Assessment carried out in 2023 found that adverse impacts from fine particulate matter are not expected and the effects of the operation on local particulate matter concentrations are expected to be Negligible.

However, as a precautionary measure, PM_{10} and $PM_{2.5}$ monitoring is proposed at key locations on the site boundary towards receptors, to alleviate any concerns from local residents and enable real-time alerts to be sent to the site in the case of significant fine particulate matter emissions.

It is therefore recommended that appropriate MCERTS certified devices are installed at key locations on the site boundary, in combination with the depositional and directional dust set out above and in Appendix A. Monitors should comply with the recent Position Statement released by the IAQM[11], which highlights deficiencies in certain low-cost monitors that are incapable of reading high-dust concentrations.

Monitoring should be installed in suitable locations, with suggested locations shown above in Figure 4.3 and Figure 4.4, and should be used when operations have been assessed to have any risk of emissions towards nearby receptors. Monitors should be maintained in accordance with the manufacturer's specifications, with regular servicing and maintenance as required.

Locations of the dust monitors should be reviewed with Table 4.3 in mind when work progresses from one phase to another, or when any new work is undertaken within 200 m of a receptor location.

[11] https://iaqm.co.uk/wp-content/uploads/2013/02/IAQM-PS-Construction-Monitoring-FINAL-2025.pdf

Monitors should be fitted with an integrated anemometer and wind gauge to enable directional reporting, with data are reported in real-time. This will enable real-time analysis of the potential source of any high concentrations.

An alert system for high PM_{10} levels should be set up to advise relevant personnel at the site so that action can be taken, in accordance with the mitigation measures set out in Section 3.

An initial alert level of 190µg/m^3 over a 1-hour interval is suggested as a starting point, which is drawn from best practice guidance for the construction industry[12]. This alert level will be reviewed after collection of a reasonable dataset (e.g. after 6 months of monitoring), and a site-specific alert level will be evaluated.

In the event of an alert being sent, the following actions should be undertaken immediately:

- Assess current meteorological conditions;
- Determine if any breakdowns/malfunctions on site are causing issues;
- Check that standard mitigation measures are in place, such as water sprays and the mitigation measures set out in Section 3;
- If a dust source on site is identified, enhance the dust mitigation measures and/or modify or halt the process to prevent emissions leaving the site, as necessary;
- Record these actions in the site logbook; and
- Determine what measures could be put in place to minimise the potential for emissions from this source in the future.

[12] Institute of Air Quality Management (2018). *Guidance on Monitoring in the Vicinity of Demolition and Construction Sites (v1.1)*

5 Emergency response

An emergency response procedure, to be followed in the event of a major dust emission, should be kept at the site office.

For the purposes of emergency response, major dust emissions will be defined as including:

- visible dust crossing the site boundaries;
- persistent fugitive dust from mineral extraction;
- persistent fugitive dust when loading or tipping soils, minerals or overburden;
- persistent fugitive dust from transport or plant movements; and
- persistent wind-blown dust.

The contact details of key personnel and organisations will be listed in the procedure.

6 Complaints

All complaints regarding dust emissions should be recorded and reported to the Site Manager, who should investigate the circumstances and ensure that the necessary corrective measures are taken.

Details of the complaint, such as date, time, weather conditions, site operations and description of the incident, should be recorded using the complaints log form given in Appendix B, along with any immediate actions taken to ameliorate the issue as well as longer term or operational changes made to prevent the incident/s from occurring again. This information shall be compiled into the existing Integrated Management System and made available to RCC to review during routine site visits.

All complaints should be investigated as soon as practically possible, and the complainant should be kept informed throughout the investigation. Complaints records are currently discussed during liaison meeting with RCC, with Environment Agency staff present, and this will continue to occur.

The method by which complaints are investigated may differ depending on the nature of the complaint. Where practical, complaints should be reviewed with reference to appropriate dust and/or PM_{10} monitoring data on the nearest site boundary. If necessary, additional visual or equipment-based monitoring should take place at or near the complaint location, in order to measure dust deposition levels at a higher frequency, or to collect physical dust samples of dust for further analysis.

Details of any subsequent investigation and any corrective measures taken to address the complaint should be provided to the relevant parties within 7 days of a request made in writing, and recorded in the Integrated Management System.

In the event of any dust complaint substantiated after consultation with RCC, the effectiveness of the dust management and monitoring plan should be reviewed.

7 Inspections and reporting

On operational days the quarry management team (or other designated persons) should maintain a daily record of the observed dust conditions and monitoring carried out throughout the day, recording the time of any additional dust management notifications issued by the earthworks team, any dust suppression measures employed within the 400 m working area of a residential property, details of the operational area, prevailing weather conditions and any measures taken to minimise the propagation of dust.

Inspection records shall be held by the Quarry Manager and will be available for inspection by RCC during any routine site monitoring visits.

Should it become necessary to carry out any dust monitoring, a copy of all results will be held by the Quarry Manager and will be made available for inspection by RCC during any routine visits.

8 Review and update

The continuing effectiveness of this DMP should be reviewed annually in consultation with RCC and the Rutland Quarry Forum, if requested. The reviews will take into account any complaints history, up to date monitoring records and any recent sensitive developments on neighbouring land.

Reviews of the plan will also be undertaken in the event of any significant changes to on-site operations.

The plan should be amended as necessary, including any changes to the monitoring methods and control measures which may be agreed.

Appendix A: Recommended dust monitoring procedure

The purpose of any monitoring at or near the site boundary would be to evaluate the direction and quantity of dust flux towards off-site receptor locations.

If dust monitoring is required, directional dust should be monitored using DustScan directional dust sticky pad samplers, or similar. Being cylindrical, the samplers collect dust from 360° around the sampling head and are reported in discrete 15° intervals (i.e. 0 – 15°, 15 – 30° and so on). Similarly, if required, dust settlement should be monitored using DustScan DustDisc settlement samplers, or similar. This sticky pad monitor collects dust falling out of the air and depositing onto a horizontal surface.

The samplers should be installed in accordance with best practice guidance (including M17) and the supplier's instructions and should be located away from nearby obstructions to ensure a clear air flow to the monitoring head.

The dust gauges are of modular design to facilitate easy exchange by site personnel. Samples should be collected at fortnightly or weekly intervals, at which point they should be taken in for analysis.

Both directional and deposited dust samples are analysed for dust coverage (Absolute Area Coverage, AAC) and dust soiling (Effective Area Coverage, EAC) which are typically expressed as %AAC and %EAC, both per sampling interval and per day. The potential risk of annoyance through directional dust and dust settlement at each sampling location can be assessed in accordance with the 'risk' matrices in Table A.1 and Table A.2 respectively. To ensure that a reliable dust 'risk' is calculated, sample monitoring periods should not exceed two weeks.

The dust monitoring data would also be assessed, if necessary, in relation to community response and complaint records, and the results of the monitoring should be used to evaluate site dust control and reported to the relevant Minerals Planning Authority (MPA) on a regular basis. A record should be kept of the findings and of any actions which are subsequently taken.

The suitability and necessity of dust monitoring regime should be reviewed over time. Any potential monitoring, revision of dust sampling locations, methods or trigger levels should be discussed with the MPA before implementation. Results should be summarised and evaluated in regular dust summary reports as required, with reference to site activities and any dust complaints.

Table A.1: Directional dust annoyance 'risk' matrix for use with directional dust samplers

EAC: Dust soiling	AAC: Dust coverage				
	Level 0: <80%/interval	Level 1: 80 to <95%/interval	Level 2: 95 to <99%/interval	Level 3: 99 to 100%/interval	Level 4: 100% over 45°/interval
Level 0: <0.5%/day	Very Low	Very Low	Very Low	Low	Medium
Level 1: 0.5 to <0.7%/day	Low	Low	Low	Medium	High
Level 2: 0.7 to <2.0%/day	Medium	Medium	Medium	High	High
Level 3: 2.0 to <5.0%/day	High	High	High	High	Very High
Level 4: ≥5%/day	Very High	Very High	Very High	Very High	Very High

Table A.2: Deposited dust annoyance 'risk' matrix for use with DustDisc samplers

EAC: Dust soiling	AAC: Dust coverage				
	Level 0: <80%/interval	Level 1: 80 to <95%/interval	Level 2: 95 to <99%/interval	Level 3: 99 to <100%/interval	Level 4: 100%/interval
Level 0: <0.5%/day	Very Low	Very Low	Very Low	Low	Medium
Level 1: 0.5 to <0.7%/day	Low	Low	Low	Medium	High
Level 2: 0.7 to <2.0%/day	Medium	Medium	Medium	High	High
Level 3: 2.0 to <5.0%/day	High	High	High	High	Very High
Level 4: ≥5%/day	Very High	Very High	Very High	Very High	Very High

Appendix B: Complaints log form

Customer Details	
Name	
Address Postcode	
Contact Details	
Tel	
Email	
Date	
Complaint Ref No.	
Complaint Details	

Investigation Details	
Investigation carried out by	
Position	
Date & time investigation carried out	
Weather conditions	
Wind direction and speed	
Investigation findings	
Feedback given to Environment Agency and/or local authority	
Date feedback given	
Feedback given to public	
Date feedback given	

Review and Improve	
Improvements needed to prevent a reoccurrence	
Proposed date for completion of the improvements	
Actual date for completion	
If different insert reason for delay	
DMP update required?	
Date of DMP update	

Closure	
Site manager review date	
Site manager signature to confirm no further action required	

Appendix C: Dust minimisation scheme (from current Planning Permission)

DUST MINIMISATION SCHEME

1. The principal activities which may give rise to dust are:-

   a) Soil stripping;
   b) Traffic on internal haul roads;
   c) Blasting;
   d) Loading of limestone onto quarry vehicles;
   e) Extraction of clay;

2. In order to minimise any dust created by these activities, some or all of the following steps will be taken as appropriate:-

   a) Tarmac surfaced roads to be regularly swept.
   b) All spillages to be removed without delay.
   c) All haul roads within the site to be watered as necessary to control dust from internal traffic movements (1-2 each hour during dry conditions), either by water bowser or fixed spray system.
   d) Water bowser to be available for use on site at all times.
   e) Prevailing meteorological conditions to be monitored.
   f) Volume of water applied to road surface to be monitored and adjust according to weather conditions.
   g) Any dry, exposed material to be watered as necessary in dry and windy conditions.
   h) Drilling rig to be fitted with efficient dust control measures.
   i) Haul roads to be compacted, graded and maintained.

APPENDIX 3 – NOISE

Walker Beak Mason Limited
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ACOUSTIC CONSULTANTS

Technical Note

Prepared by:	**Dr Robert Storey**	Date:	**05 August 2024**
Project:	**Castle Cement Limited – Grange Top Quarry, Ketton**	Ref:	**5176**
For:	**Ian Briggs (Landesign Planning and Landscape Ltd)**	Page:	**1 of 18**
Subject:	**Extensions to Grange Top Quarry – Additional Information on Noise**		

Introduction

WBM prepared a noise assessment for the proposed extensions to Grange Top Quarry at Ketton in Rutland dated 15 June 2023..

Following the submission of the application (Ref. 2024/0066/MIN), Rutland County Council Environmental Health provided a response (added to the Planning Portal on 15 February 2024) detailing points that they would like clarified including aspects on which they desired further information/data.

This Technical Note has been prepared with a view to addressing the requirements of the response from Rutland County Council Environmental Health.

To aid understanding, a glossary of acoustic terms is provided in Appendix A to this Technical Note.

Environmental Health Comments

The text relating to noise in the Environmental Health response are reproduced below:

"*We agree with the suggested noise monitoring locations and limits are in table 7. We do require details of the periodic monitoring and monitoring in response to complaint for the phases working.*

We need 3600 (sic) photos of the sound level meter in-situ when background sound monitoring was undertaken.

I do wish to see further sound monitoring at Shacklewell Lodge and Barns Stamford Road, Empingham in favourable meteorological conditions of low <2m/s wind speeds and away from trees in order to obtain background sound measurements through the day when the quarry is expected to be operating. Given the longevity and impact of the quarry, I need to be assured these background sound levels are genuine and based on robust methodology and therefore a few snapshot samples are insufficient.

I would like to agree on a periodic noise monitoring programme and a reactive procedure for when complaints are received."

ANC ACOUSTICS & NOISE CONSULTANTS

Attempted Contact with Environmental Health

WBM emailed the Environmental Health Officer on 18 April 2024 to address some of the points raised and to attempt to agree an approach to the additional noise surveys.

No response to the 18 April 2024 email was received from the EHO and therefore a follow up email was sent on 21 May 2024 stating that it was assumed that the approach was acceptable and the additional survey work would go ahead as planned (when suitable weather conditions were forecast) unless WBM were to hear to the contrary. WBM have received no response from Rutland County Council Environmental Health to date.

The WBM responses to some points as contained within the 18 April 2024 email have been replicated in this Technical Note and the full email correspondence has been reproduced in Appendix B. This Technical Note therefore provides a full response to the points and further information request from Rutland County Council Environmental Health.

Periodic Monitoring/Monitoring in Response to Complaint

WBM suggest that a schedule and method for periodic monitoring of noise and monitoring/investigation following complaints is detailed in a Noise Management Plan for the site.

The requirements for such a plan and the details which are to be included could be conditioned as part of a planning permission.

Photos of the Sound Level Meters During Baseline Surveys

Photographs of the installed sound level meters are included in Appendix C to this Note, as required by the EHO.

Further Baseline Monitoring at Shacklewell Lodge and Shacklewell Barns

WBM suggested continuous attended sample measurements at two locations over the period 10:00 to 14:00. This time period was chosen to avoid the higher traffic flows during commuting times and to represent the typically quieter periods of the day.. The survey was undertaken on Wednesday 31 July 2024.

As required, the survey was undertaken when there was a forecast indicating wind speeds of no more than 2 m/s. Wind speeds were taken regularly throughout the measurement period using a handheld anemometer.

Permission was granted to measure at Shacklewell Barns within the grounds of the property, i.e. at a location away from foliage closer to the dwellings themselves. Two sound level meters were used at this location to allow for the comparison of 15 minute and 1 hour duration measurements.

The second location was chosen to be to the west of the property signed as Shacklewell House. The location was closer to trees that the first location, but was placed in a field entrance as far away from trees as possible between Shacklewell House and the next property on the A606. A location closer to the property at Shacklewell House was rejected due to some works taking place on the property to reduce the potential influence on measured sound levels of those works. These measurements were of 15 minutes in duration.

The wind speeds measured throughout the survey varied between 0 and 1.5 m/s with the occasional short gust of up to 2-3 m/s.

It should also be noted that signage at the junction of the A1 leading to the A606 stated that there was no through traffic to Melton Mowbray and Nottingham and that there was a diversion in place. As such, it is possible that the traffic flows on the A606 were reduced from those normally expected.

An aerial photographs showing the noise survey locations in relation to the location of the installed sound level meter used in 2022 and the properties on the A606 is included in Appendix D.

Instrumentation and calibration details are presented in Appendix E.

The full survey results from both meters are tabulated in Appendix F.

The results of the survey are summarised in the table below.

Period	Shacklewell Barns				Shacklewell House	
	Measured Sound Levels (dB)					
	$L_{Aeq,15\ min}$	$L_{A90,15\ min}$	$L_{Aeq,1\ hour}$	$L_{A90,1\ hour}$	$L_{Aeq,15\ min}$	$L_{A90,15\ min}$
10:00-10:15	62	44	62	44	69	45
10:15-10:30	61	43			68	45
10:30-10:45	63	47			69	47
10:45-11:00	62	42			69	45
1 Hour Average	**62**	**44**	**62**	**44**	**69**	**45**
11:00-11:15	61	44	61	46	68	46
11:15-11:30	61	45			68	47
11:30-11:45	62	49			68	48
11:45-12:00	62	48			69	49
1 Hour Average	**61**	**46**	**61**	**46**	**68**	**48**
12:00-12:15	62	49	62	47	69	48
12:15-12:30	63	49			69	49
12:30-12:45	62	45			69	47
12:45-13:00	62	48			68	48
1 Hour Average	**62**	**47**	**62**	**47**	**69**	**48**
13:00-13:15	63	48	62	46	68	48
13:15-13:30	62	44			68	44
13:30-13:45	62	47			69	47
13:45-14:00	62	46			68	47
1 Hour Average	**62**	**46**	**62**	**46**	**68**	**46**
Overall Average	**62**	**46**	**62**	**46**	**69**	**47**

The results from the installed sound level meter used to obtain background sound level data in 2022 are summarised in Table 6 of the WBM noise assessment dated 15 June 2023. The following average values were presented, based on the operational hours of the quarry, Monday to Friday 0700 – 1800 and Saturday 0700 – 1300:

- 62 dB $L_{Aeq,15min}$
- 46 dB $L_{A90,15min}$

As can be seen from the table above, the measured background (L_{A90}) sound levels at Shackelwell Barns were similar to those measured by the sound level meter installed in the vicinity of this location in July 2022, with the measured levels at Shacklewell House being slightly higher.

The data validates the 2022 monitoring approach, data and the suggested site noise limit for those dwellings of 55 dB $L_{Aeq,\ 1\ hour\ free}$ field in line with the advice in Planning Practice Guidance (Minerals).

Periodic Noise Monitoring Programme/Reactive Procedure for Complaints

As stated above, WBM would suggest that a periodic monitoring scheme is incorporated as part of a conditioned Noise Management Plan for the site (including noise complaint procedures). Site noise monitoring should take place either every six months or annually (or when new areas/phases are started) at the nearest noise sensitive locations to the activity area to be monitored with listening tests at the other locations identified in the noise assessment report.

Summary and Conclusions

This Technical Note has been prepared to address the requirements of Rutland Council Environmental Health who had requested further information following the submission of a noise impact assessment to accompany a planning application for two new extension areas to Grange Top Quarry which serves the Ketton Cement Works.

The various points have been answered in turn and additional noise survey work was undertaken in July 2024 for the properties at Shacklewell Lodge and Barns, as requested. The data from that noise survey has validated the data presented in the original noise assessment submitted as part of the application and the suggested site noise limit for those properties is appropriate as based on the latest Government advice relating to noise from mineral sites contained within Planning Practice Guidance (Minerals).

Regards

Dr Robert Storey
Senior Consultant

(This document has been generated electronically and therefore bears no signature)

Appendix A – Glossary of Acoustic Terms

The following section describes some of the parameters that are used to quantify noise.

Decibels dB

Noise levels are measured in decibels. The decibel is the logarithmic ratio of the sound pressure to a reference pressure ($2x10^{-5}$ Pascals). The decibel scale gives a reasonable approximation to the human perception of relative loudness. In terms of human hearing, audible sounds range from the threshold of hearing (0 dB) to the threshold of pain (140 dB).

A-weighted Decibels dB(A)

The 'A'-weighting filter emulates human hearing response for low levels of sound. The filter network is incorporated electronically into sound level meters. Sound pressure levels measured using an 'A'-weighting filter have units of dB(A) which is a single figure value to represent the overall noise level for the entire frequency range.

A change of 3 dB(A) is the smallest change in noise level that is perceptible under normal listening conditions. A change of 10 dB(A) corresponds to a doubling or halving of loudness of the sound. The background noise level in a quiet bedroom may be around 20 –30 dB(A); normal speech conversation around 60 dB(A) at 1 m; noise from a very busy road around 70-80 dB(A) at 10m; the level near a pneumatic drill around 100 dB(A).

Façade Noise Level

Façade noise measurements are those undertaken near to reflective surfaces such as walls, usually at a distance of 1m from the surface. Façade noise levels at 1m from a reflective surface are normally around 3 dB greater than those obtained under freefield conditions.

Freefield Noise Level

Freefield noise measurements are those undertaken away from any reflective surfaces other than the ground

Frequency Hz

The frequency of a noise is the number of pressure variations per second, and relates to the "pitch" of the sound. Hertz (Hz) is the unit of frequency and is the same as cycles per second. Normal, healthy human hearing can detect sounds from around 20 Hz to 20 kHz.

Octave and Third-Octave Bands

Two frequencies are said to be an octave apart if the frequency of one is twice the frequency of the other. The octave bandwidth increases as the centre frequency increases. Each bandwidth is 70% of the band centre frequency.

Two frequencies are said to be a third-octave apart if the frequency of one is 1.26 times the other. The third octave bandwidth is 23% of the band centre frequency.

There are recognised octave band and third octave band centre frequencies. The octave or third-octave band sound pressure level is determined from the energy of the sound which falls within the boundaries of that particular octave of third octave band.

Appendix A (continued)

Equivalent Continuous Sound Pressure Level $L_{Aeq,T}$

The 'A'-weighted equivalent continuous sound pressure level $L_{Aeq,T}$, is a notional steady level which has the same acoustic energy as the actual fluctuating noise over the same time period T. The $L_{Aeq,T}$ unit is dominated by higher noise levels, for example, the $L_{Aeq,T}$ average of two equal time periods at, for example, 70 dB(A) and 50 dB(A) is not 60 dB(A) but 67 dB(A).

The $L_{Aeq,}$ is the chosen unit of BS 7445-1:2003 "Description and Measurement of Environmental noise".

Maximum Sound Pressure Level L_{Amax}

The L_{Amax} value describes the overall maximum 'A'-weighted sound pressure level over the measurement interval. Maximum levels are measured with either a fast or slow time weighted, denoted as $L_{Amax,f}$ or $L_{Amax,s}$ respectively.

Sound Exposure Level L_{AE} or SEL

The sound exposure level is a notional level which contains the same acoustic energy in 1 second as a varying 'A'-weighted noise level over a given period of time. It is normally used to quantify short duration noise events such as aircraft flyover or train passes.

Statistical Parameters L_N

In order to cover the time variability aspects, noise can be analysed into various statistical parameters, i.e. the sound level which is exceeded for N% of the time. The most commonly used are the $L_{A01,T}$, $L_{A10,T}$ and the $L_{A90,T}$.

$L_{A01,T}$ is the 'A'-weighted level exceeded for 1% of the time interval T and is often used to gives an indication of the upper maximum level of a fluctuating noise signal.

$L_{A10,T}$ is the 'A'-weighted level exceeded for 10% of the time interval T and is often used to describe road traffic noise. It gives an indication of the upper level of a fluctuating noise signal. For high volumes of continuous traffic, the $L_{A10,T}$ unit is typically 2–3 dB(A) above the $L_{Aeq,T}$ value over the same period.

$L_{A90,T}$ is the 'A'-weighted level exceeded for 90% of the time interval T, and is often used to describe the underlying background noise level.

Appendix B – Email Correspondence With EHO

Email dated 18 April 2024 12:04:

Good afternoon Craig,

WBM are the consultancy dealing with noise relating to the proposed extensions to Grange Top Quarry to supply the cement works at Ketton.

I understand that it is you that I need to contact with regard to addressing the Environmental Health comments in response to the application for the extension and the submitted noise assessment. Please let me know if this is not the case.

For convenience, I have reproduced the response with regard to noise below with WBM's responses in red interspersed within the text.

"*Noise Monitoring and Control*
We agree with the suggested noise monitoring locations and limits are in table 7. We do require details of the periodic monitoring and monitoring in response to complaint for the phases working. We need 3600 photos of the sound level meter in-situ when background sound monitoring was undertaken.
WBM would suggest that a schedule and method for periodic monitoring of noise and monitoring/investigation following complaints is detailed in a Noise Management Plan for the site, which could be conditioned?
Please find attached photos of the four Ketton Install Photos 1.zip sound level meter installations as requested (I presume the formatting in the comments was lost and the text refers to requiring 360° photos!)
I do wish to see further sound monitoring at Shacklewell Lodge and Barns Stamford Road Empingham in favourable meteorological conditions of low <2m/s wind speeds and away from trees in order to obtain background sound measurements through the day when the quarry is expected to be operating. Given the longevity and impact of the quarry, I need to be assured these background sound levels are genuine and based on robust methodology and therefore a few snapshot samples are insufficient.
WBM have been instructed to undertake further baseline measurements in this area and for this purpose I would suggest continuous attended sample measurements at two locations from the period 10:00 to 14:00 to avoid the higher traffic flows during commuting times. This survey would be undertaken when there is a forecast indicating wind speeds of no more than 2 m/s as required, however, as you will appreciate organising any surveys of late has been difficult due to the weather so this may need to be scheduled once things calm down. For the two locations, WBM would suggest one location in the area of Shacklewell Barns to cover the three properties there and the other location to the east in the vicinity of Shackewell House, Brookbank House and Shacklewell Cottages. Would you consider these to be appropriate locations with regard to the requested additional survey work and please can you confirm that you would be satisfied with the acquisition of data for inclusion in an addendum to the noise assessment submitted? Ideally, the measurement locations will be as close to the dwellings as possible, but I am sure you will understand that they may need to be undertaken on publicly accessible land.
I would like to agree on a periodic noise monitoring programme and a reactive procedure for when complaints are received.
As stated earlier, I would suggest that a periodic monitoring scheme is incorporated as part of a conditioned Noise Management Plan for the site (including noise complaint procedures) with site noise monitoring to take place either every six months or annually (or when new areas/phases are started) at the nearest noise sensitive locations to the activity area to be monitored with listening tests at the other locations identified in the noise assessment report."

I look forward to hearing your thoughts and moving ahead with the work to satisfy any outstanding concerns that you may have with regard to noise from this development.

Regards,
Robert

Email dated 21 May 2024 15:33:

Good afternoon Craig,

I am emailing to follow up on the email below regarding the Castle Cement site at Ketton and Extensions to Grange Top Quarry.

I do not seem to have seen a response and wanted to get some feedback from you prior to undertaking the further survey work.

As you will appreciate, due to the inclement and unpredictable weather we have not missed any clear opportunity to get the data and it is likely that the required low winds speeds are more likely to occur in June/July when we should also have cleared the backlog of surveys that has accumulated due to the difficulties with inappropriate weather.

I look forward to hearing from you. I am away next week, but if I have not heard back from you going into June, I will assume that my approach is acceptable to you and will schedule the survey work.

Regards,
Robert

Appendix C – Photographs of Installed Meters (July 2022)

Installed Sound Level Meter – Shackewell Barns:

Appendix C (continued)

Installed Sound Level Meter – Ketco Avenue:

Appendix C (continued)

Installed Sound Level Meter – Northwick Road:

Appendix C (continued)

Installed Sound Level Meter – Wytchley Warren Farm:

Appendix D – Noise Survey Locations (July 2022/July 2024)

Survey (2024) and Install (2022) Locations:

Location	Description
Shacklewell Barns (2024)	3.5 metres from brick wall in turning area outside No 1-3 Shacklewell Barns, approximately 26 metres from centre of A606 carriageway.
Shacklewell House (2024)	At field entrance ~50-55 metres to west of Shacklewell House, approximately 15 metres from centre of A606 carriageway.
Shacklewell Lodge (2022 install)	On track around field directly opposite entrance to Shacklewell Lodge/Barns, approximately 20-25 metres from centre of A606 carriageway – pelicase chained to telegraph pole.

Appendix E – Instrumentation and Calibration Details

Date and Locations of Survey

Wednesday 31 July 2024

Noise measurements locations as follows:

Location		Description
A	Shacklewell Barns	3.5 metres from brick wall in turning area outside No 1-3 Shacklewell Barns, approximately 26 metres from centre of A606 carriageway.
B	Shacklewell House	At field entrance ~50-55 metres to west of Shacklewell House, approximately 15 metres from centre of A606 carriageway.

Survey carried out by

Sarah Large, Robert Storey

Weather Conditions

Date	Weather Condition
Wednesday 31 July 2024	Dry, sunny, clear sky, gentle E breeze <1-2m/s, but generally still, very occasional short gusts 2-3 m/s, 21-27ºC.

Instrumentation used (Serial Number)

Location	Instrumentation
Shacklewell Barns (15 minute measurements)	Norsonic 140 Sound Level Meter (1403138)
	Norsonic 1251 Calibrator (31991)
Shacklewell Barns (1 hour measurements)	Norsonic 140 Sound Level Meter (1402998)
	Norsonic 1251 Calibrator (32466)
Shacklewell House (15 minute measurements)	Norsonic 140 Sound Level Meter (1404819)
	Norsonic 1251 Calibrator (33321)

Appendix E (continued)

Calibration

The sensitivity of the meter was verified on site immediately before and after the survey. The measured calibration levels were as follows:

Instrumentation	Start Cal	End Cal
Wednesday 31 July 2022		
Norsonic 140 Sound Level Meter (1403138)	113.7 dB(A)	113.5 dB(A)
Norsonic 1251 Calibrator (31991)		
Norsonic 140 Sound Level Meter (1402998)	113.6 dB(A)	113.6 dB(A)
Norsonic 1251 Calibrator (32466)		
Norsonic 140 Sound Level Meter (1404819)	113.6 dB(A)	113.6 dB(A)
Norsonic 1251 Calibrator (33321)		

The meters and calibrators are tested monthly against Norsonic Calibrators, type 1253 (serial number 22906) and type 1256 (serial number 125626100) both with UKAS approved laboratory certificates of calibration. In addition, the meters and calibrators undergo traceable calibration at an external laboratory every two years.

Survey Details

Attended sample measurements of 15 minute or 1 hour duration were taken at each of the chosen locations. The microphone was at a height of approximately 1.4 metres above local ground level, with a windshield used throughout. The start times of each sample are tabulated with the results in Appendix F.

Appendix F – Noise Survey Results (July 2024)

Results and Observations

Wednesday 31 July 2024 – Nor 1403138 (15 minute measurements)

Location	Start Time	Results dB (T = 15 minutes)			Comments / Observations
		$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$	
A – Shacklewell Barns	10:00	62	66	44	Road traffic. Birdsong. Distant jet aircraft. Distant light aircraft.
	10:15	61	65	43	Road traffic noise. Birdsong.
	10:30	63	67	47	Road traffic noise. Distant jet aircraft. Gentle breeze in trees. Car drives in through gates, miminal engine noise, gates rattle, car on gravel driveway.
	10:45	62	66	42	Road traffic noise. Gentle breeze in trees. Birdsong.
	11:00	61	65	44	Road traffic noise. Birdsong.
	11:15	61	66	45	Road traffic noise. Jet aircraft.
	11:30	62	66	49	Road traffic noise. Car drives in through gates, metal gate clank, car on gravel, car doors opening / closing, voices at dwelling.
	11:45	62	66	48	Road traffic noise. Light breeze in trees, generally still. Birdsong. Voices at dwellings.
	12:00	62	66	49	Road traffic noise. Birdsong. Gentle breeze in trees. Brief dog barks. Gate to dwellings opening / closing.
	12:15	63	67	49	Road traffic noise. Activity at dwelling (walking on gravel). Engine idling in layby. Car arrivals and departures at dwellings, metal clank of gates, engine noise near meter. Voices at dwelling.
	12:30	62	66	45	Road traffic noise. Light aircraft. Gentle breeze in trees. Activity at dwelling (gravel, car doors). Car leaves dwellings, metal gate clank.
	12:45	62	66	48	Road traffic noise. Light aircraft circling. Birdsong. Breeze in trees, though generally still. Tractor on road (noisy).
	13:00	63	66	48	Road traffic noise. Car drives in through gates, metal clank of gates. Light aircraft.
	13:15	62	66	44	Road traffic noise. Cars driving in through gates, metal clank of gates. Gentle breeze in trees. Light aircraft.
	13:30	62	66	47	Road traffic noise. Light aircraft. Gentle breeze in trees. Activity at dwelling (gravel noise and movement around car).
	13:45	62	66	46	Road traffic noise. Gentle breeze in trees. Car drives out of gates, metal clank of gates. Light aircraft.

Appendix F (continued)

Results and Observations

Wednesday 31 July 2024 – Nor 1402998 (1 hour measurements)

Location	Start Time	Results dB (T = 1 hour)		
		$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$
A – Shacklewell Barns	10:00	62	66	44
	11:00	61	65	46
	12:00	62	66	47
	13:00	62	66	46

Appendix F (continued)

Results and Observations

Wednesday 31 July 2024 – Nor 1404819 (15 minute measurements)

Location	Start Time	Results dB (T = 15 minutes)			Comments / Observations
		$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$	
B – Shacklewell House	10:00	69	75	45	Distant and passing road traffic, aircraft, birdsong, very slight breeze in trees at some points, some activity at property. ENE breeze 0-1 m/s.
	10:15	68	74	45	Distant and passing road traffic, aircraft, birdsong, very slight breeze in trees at some points, some activity at property including reversing bleeper. ENE breeze 0-1 m/s with odd gust to 2-2.5 m/s.
	10:30	69	75	47	Distant and passing road traffic, aircraft, birdsong, very slight breeze in trees at some points, some activity at property. ENE breeze 0-1.5 m/s with odd gust to 2-2.5 m/s.
	10:45	69	75	45	Distant and passing road traffic, aircraft, birdsong, very slight breeze in trees at some points, some activity at property, distant crop sprayer occasionally just audible. E breeze 0-1.5 m/s with odd gust to 2-2.5 m/s.
	11:00	68	73	46	Distant and passing road traffic, aircraft, birdsong, very slight breeze in trees at some points, some activity at property, distant crop sprayer occasionally just audible. E breeze 0-1 m/s with odd gust to 2 m/s.
	11:15	68	73	47	Distant and passing road traffic, aircraft, birdsong, very slight breeze in trees at some points, distant crop sprayer occasionally just audible. E breeze 0-1 m/s with odd gust to 1.5 m/s.
	11:30	68	74	48	Distant and passing road traffic, aircraft, birdsong, very slight breeze in trees at some points, crop sprayer occasionally just audible. E breeze 0-2 m/s with odd gust to 2.5 m/s.
	11:45	69	74	49	Distant and passing road traffic, aircraft, birdsong, very slight breeze in trees at some points, some activity at property. E breeze 0-2 m/s with odd gust to 2.5-3 m/s.
	12:00	69	74	48	Distant and passing road traffic, aircraft, birdsong, very slight breeze in trees at some points, some activity at property. E breeze 0-1.5 m/s with odd gust to 2 m/s.
	12:15	69	74	49	Distant and passing road traffic, aircraft, birdsong, very slight breeze in trees at some points, some activity at property. E breeze 0-2 m/s with odd gust to 2.5-3 m/s.
	12:30	69	74	47	Distant and passing road traffic, aircraft, birdsong, very slight breeze in trees at some points, some activity at property. E breeze 0-2 m/s with odd gust to 2.5-3 m/s.
	12:45	68	74	48	Distant and passing road traffic, aircraft including low light aircraft, birdsong, very slight breeze in trees at some points, some activity including car horns at property. E breeze 0-1 m/s with one gust to 2.5 m/s.

Appendix F (continued)

Results and Observations

Wednesday 31 July 2024 – Nor 1404819 (15 minute measurements)

Location	Start Time	Results dB (T = 15 minutes)			Comments / Observations
		$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$	
	13:00	68	74	48	Distant and passing road traffic, aircraft, birdsong, very slight breeze in trees at some points, some activity at property. E breeze 0-1.5 m/s with odd gust to 2 m/s.
	13:15	68	74	44	Distant and passing road traffic, aircraft including low light aircraft, birdsong, very slight breeze in trees at some points. E breeze 0-1 m/s with odd gust to 2-2.5 m/s.
	13:30	69	74	47	Distant and passing road traffic, aircraft including low light aircraft, birdsong, very slight breeze in trees at some points. E breeze 0-1 m/s with odd gust to 2 m/s.
	13:45	68	74	47	Distant and passing road traffic, aircraft including low light aircraft, birdsong, very slight breeze in trees at some points. E breeze 0-1.5 m/s with odd gust to 2 m/s.

APPENDIX 4 – ANGLIAN WATER – WITHDRAWAL OF OBJECTION

Planning Reference	2024/0066/MIN	**Site**	Castle Cement Ltd Ketton Works
Summary	Removal of objection subject to conditions	**AW Ref**	PLN-0207610
Response by	Planning & Capacity Team	**Date**	18/06/2025

We are writing to update our formal comments to planning application 2024/0066/MIN. We have been working collaboratively with the applicant and have undertaken detailed risk assessment regarding the impact of the development and its operation on our Empingham water main.

Anglian Water are now in a position to remove our objection subject to the inclusion of a planning condition restricting the extraction limit and a maximum ground vibration limit of 25mm ppv at any point above the AW pipe/tunnel.

Should the scheme be subsequently altered to reduce either the limit of extraction in relation to the Anglian Water water main or it be proposed to reduce the ground vibration limit in relation to the pipe, then our objection will be reinstated.

APPENDIX 5 – CLIMATE CHANGE ASSESSMENT

Climate Change Assessment

Grange Top Quarry

January, 2026

Heidelberg Materials

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Document Control Sheet

Project Information

Title	Grange Top Quarry
Job Code	ZCCLKC
Report Ref	ZCCLKC_CCA
Report Type	Climate Change Assessment
Client	Heidelberg Materials
Client Contact	Ian Briggs (Landesign)
Revision	A
Status	Final
Date of Issue	09/01/2026

Revision History

Revision	Date	Author	Reviewer	Approver	Status
A	09/01/2026	Paul Eaton Ben Morris Gordon Allison	Gordon Allison	Gordon Allison	Draft

Distribution

Organisation	Contact	Date of Issue	Copies
Heidelberg Materials	Ian Briggs	09/01/2026	1

Disclaimer

This report takes into account the particular instructions and requirements of our client. It is not intended for, and should not be relied upon by, any third party and no responsibility is undertaken to any third party.

This report may include data obtained from trusted third-party consultants/laboratories that have been supplied to us in good faith. Whilst we do everything we can to ensure the quality of all the data we use, we cannot be held responsible for the accuracy or integrity of third party data.

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Glossary

Term	Definition
Aggregates	Granular materials that can be land won, marine, secondary or recycled. The three primary types of aggregate minerals are sand, gravel and crushed rock. Substitute, secondary and recycled materials and mineral waste can contribute to the sustainable supply of aggregates. Aggregates serve both as final products and as raw materials in the production of construction materials such as concrete, asphalt, lime and mortar
Carbon	The term 'carbon' is frequently used a shorthand for 'Greenhouse Gas Emissions'. For example 'low carbon cement' means cement produced with relatively low Greenhouse Gas emissions.
Carbon Budget	A carbon budget is the estimated limit of total greenhouse gas emissions that can be emitted over a certain amount of time in order to keep global temperatures within a certain threshold, typically 1.5°C above pre-industrial levels (to align with the Paris Agreement).
Carbon Border Adjustment Mechanism	Proposed government legislation to control the import of higher embodied carbon products competing with domestic products where the cost of carbon emissions has been allocated to them.
Climate Change	Climate change is the large-scale, long-term shift in the planets' weather patterns and average temperatures. Climate change can be due to humans or external forcings like volcanic eruptions.
CO_2e (Carbon dioxide equivalent)	This is a unit of measurement used to compare the global warming potential of different greenhouse gases by converting them to equivalent amount of carbon dioxide. Using this metric means that we can express a carbon footprint with one number rather than using different values for each greenhouse gas.
Decarbonisation	The process of reducing or eliminating carbon dioxide (CO_2) emissions from human activities. It is the way countries, organisation, regions or individuals aim to get net zero emissions.
Defra	Department for Environment, Food and Rural Affairs, the government department responsible for compliance with air quality legislation at national level
Direct Effects	Environmental effects directly caused by the preparation, construction or operation of a project in a particular location
Environmental Impact Assessment (EIA)	A procedure that is implemented for certain types of projects that ensures decisions are made in full knowledge of any potential significant environmental impacts.
EPUK	Environmental Protection UK
EU	European Union
Greenhouse Gas (GHG)	Greenhouse gases are natural and human-made gases that trap heat in the Earth's atmosphere by absorbing and emitting infrared radiation, causing the greenhouse effect. They primarily include water vapour, carbon dioxide, nitrous oxide, methane and ozone.
Indirect Effects/Impacts	Effects/impacts that occur away from the immediate location or timing of the proposed action, e.g. quarrying of aggregates elsewhere in the country as a

Term	Definition
	result of a new road proposal, or as a consequence of the operation of the project (see also secondary effects)
Mitigation	The reduction in the severity of an impact on a receptor.
Net Zero Carbon	Net zero carbon refers to achieving equilibrium between the amount of carbon dioxide emitted into the atmosphere by human activities and the amount removed or offset.
NRMM	Non-Road Mobile Machinery
NPPF	National Planning Policy Framework
Paris Agreement	The Paris Agreement is a legally binding international treaty on climate change, adopted in 2015 at COP21 in Paris. Its main goal is to limit global warming well below 2°C, but preferably to 1.5°C, compared to pre-industrial levels.
Reserves	Resources that are both economically viable and technologically feasible to extract at the current time
Scope 1 Emissions	Direct emissions from sources owned or controlled by the organisation, for example diesel powered machinery
Scope 2 Emissions	Indirect emissions from the generation of purchased electricity used by the organisation
Scope 3 emissions	All other indirect emissions that occur in the value chain, including both upstream and downstream activities
Secondary Effects	Effects that occur as a consequence of a primary effect or as a result of a complex pathway
UNFCCC	United Nations Framework Convention on Climate Change

1 Introduction

1 Heidelberg Materials ('HM') operates Ketton Cement Works ('Works'), located in Ketton, Stamford, PE9 3SX.

2 HM are seeking a 'stay in business' planning permission to extend Grange Top Quarry, to construct and use a new access to the Works, and associated works, to facilitate the continued supply of minerals to the Works, application reference 2024/0066/MIN ('Application').

3 There are two quarry extensions proposed. One sits to the south of Empingham Road, between Ketton village and Wytchley Warren cottages ('Field 14'). Field 14 occupies c.39ha and contains approximately 4.5 million tonnes of viable clay overlying 6 million tonnes of limestone. The other sits northwest between the Works and the A606 at Shacklewell. ('NW Land') The NW Land comprises c.109 hectares with nearly 28 million tonnes of high-carbonate limestone and no clay.

4 The new access to the Works comprises 3 km of new road and a roundabout, situated in the NW Land and providing direct access to the A606, diverting traffic away from Tinwell and Ketton and will be built in the early 2030s when work in NW Land starts.

5 The Application consolidates existing quarry permissions and covers the areas identified above and the currently unworked and unrestored parts of the existing Grange Top Quarry, with a total area of 560.2ha ('Site').

6 The limestone and clay from Grange Top Quarry is used to make cement in the Works. The current output of the Works is an estimated c.1 million tonnes of cement per annum..

7 The Application does not include the Works; however, the Greenhouse Gas (GHG) emissions from the Works are included in this assessment. The Works is regulated for its GHG emissions under a UK Emissions Trading Scheme permit issued by the Environment Agency. It also has an Environmental Permit regulating its environmental and health-impacting emissions.

8 The site lies within the jurisdiction of the local authority, Rutland County Council (RCC). Peterborough City Council (PCC) provide a collaborative Environmental Health and Licencing service for and on behalf of RCC. The Environment Agency regulates the GHG and Environmental Permits for the Works.

9 DustScanAQ (herein DS) has been instructed by HM to undertake a quantitative climate change assessment in support of the planning application.

1.1 Competency and Expertise

10 Ben Morris BSc is a graduate consultant at DustScanAQ.

11 Paul Eaton BSc AMIAQM, AMIEnvSci is a senior consultant at DustScanAQ.

12 Gordon Allison BSc (Hons), MSc, MIAQM, MIEnvSc, is a Principal Consultant at DustScanAQ. He is a 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. He was trained as a verifier in the EU Emissions Trading Scheme.

1.2 Objectives

13 To undertake a climate change assessment and quantify the Greenhouse Gas (GHG) emissions associated with the Application by determining:

- Baseline emissions associated with previous years of operations at Grange Top Quarry and the future projected emissions up until ceasing of extraction on Site.
- The emissions associated with the Works, as the limestone and clay from Grange Top Quarry is exclusively used to supply the Works. Emissions are considered with reference to the UK cement market.
- The climate baseline of the Site and to project the future baseline of annual average temperature, precipitation and wind.
- The resilience of the Site, Site staff and Site equipment to climate change considering four scenarios associated with climate change:
    - An increase in winter precipitation
    - A decrease in summer precipitation
    - An increase in summer temperature
    - An increase in extreme weather events.

1.3 Site Setting

14 Figure 1.1 shows the Site. The Site is located approximately 3 km west of the nearby town of Stamford and the major A1 road.

15 The Site and Works are directly north of the Ketton village and currently accessible by the A6121 and Empingham Road. The A606 is located north of the current quarry site and borders the NW Land.

16 The current quarry operations are set in a ‘horseshoe’ like shape around the Works. Dumpers haul the extracted materials to a fixed crusher that feeds the Works with conveyors.

17 Field 14 is located to the south of the current quarry and is roughly triangular in shape, whilst the NW Land is roughly rectangular in shape. The areas proposed for quarrying contain the minerals, limestone and clay, close to the surface, to be used in the cement-making process. The clay is the source of iron, aluminium and silicate compounds needed to react with lime to produce the active compounds in Ordinary Portland Cement.

18 The location of the site in relation to the other ten cement works in the UK is shown in Figure 1.2.

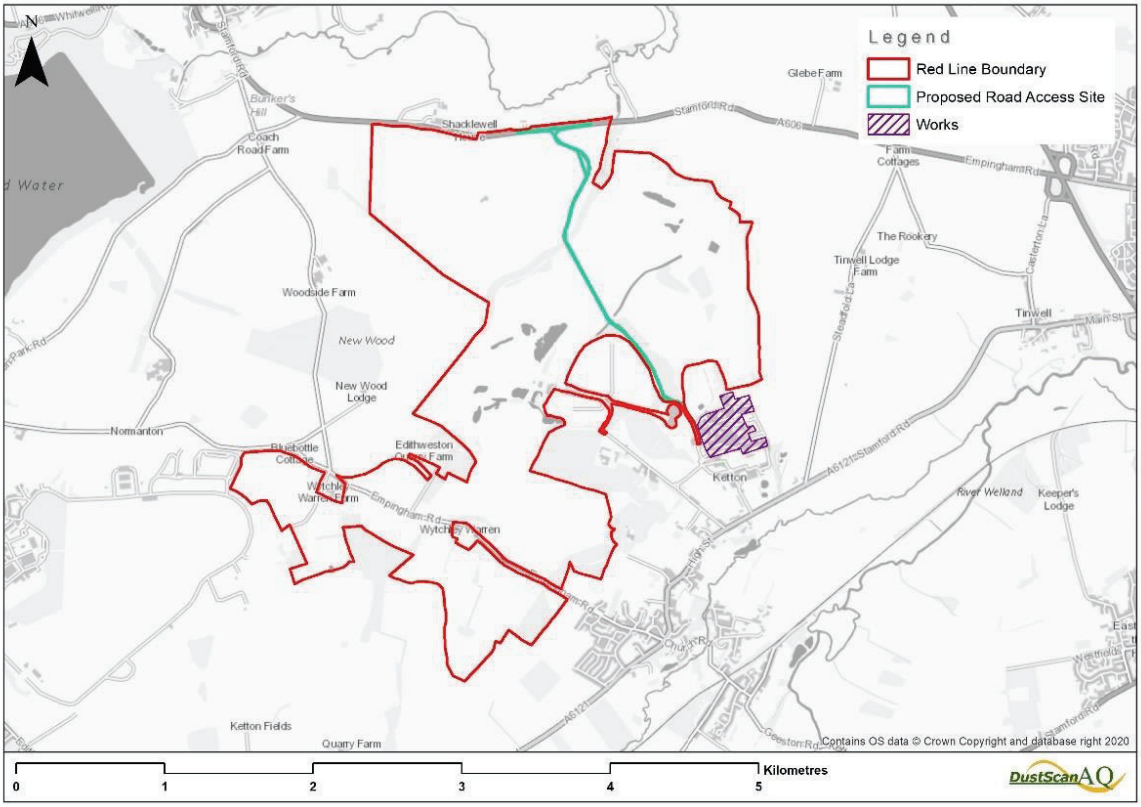


Figure 1.1: Proposed Development Location showing the redline boundary and Works

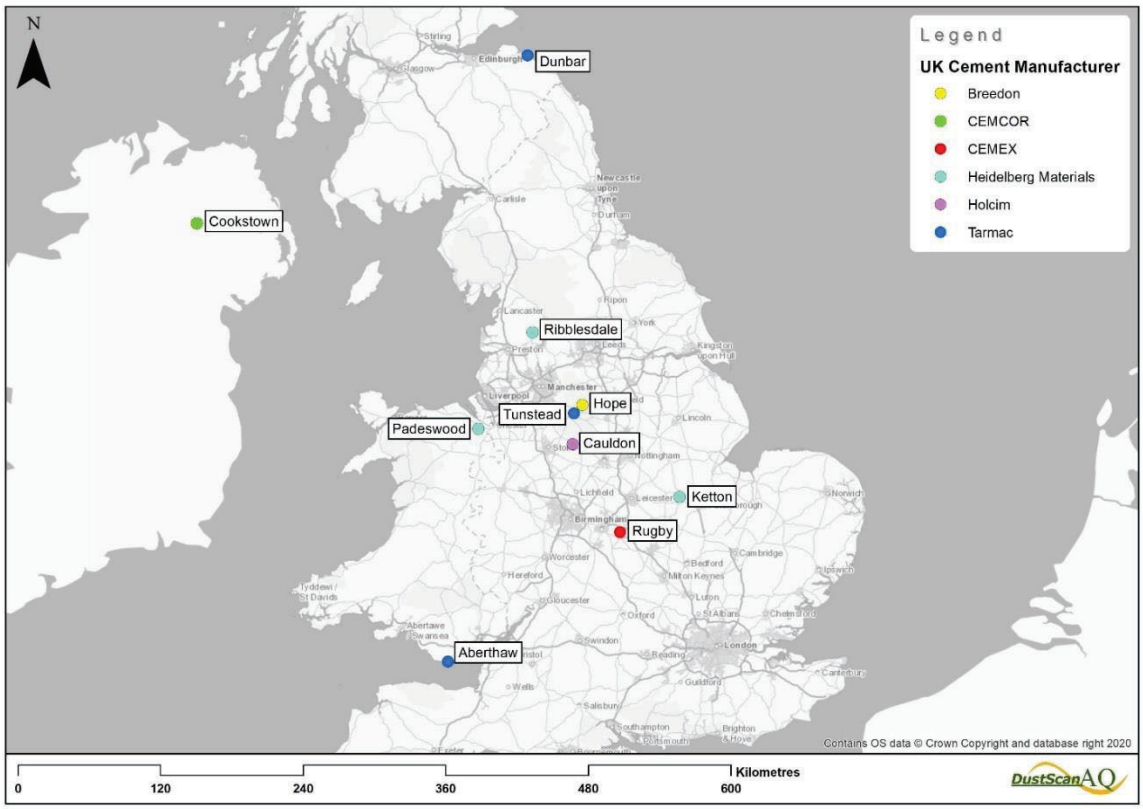


Figure 1.2: Ketton Cement Works relative to other UK Cement Manufacturing Works

1.4 Proposed Development

19 Grange Top Quarry currently extracts, and the Site is anticipated to extract up to 1.6 mpta of material, with the Works producing around 1 million tonnes of cement per annum.

20 Rock is extracted by drilling and blasting; blasted rock is then loaded onto dump trucks and hauled to a fixed crusher. A conveyor system transports the aggregate to the Works for further processing. The majority of mineral handling and processing is understood to take place at the Works.

21 The two extension areas have a slightly different geology. Field 14 contains both clay and limestone, whereas the NW Land only contains limestone. Therefore, both extension areas will be worked concurrently so that the deposits of clay in Field 14 can be used in the production of cement at the Works. The anticipated time for extraction in both areas will be c.30 years and expected to be required approximately by 2030-32.

22 Restoration will be carried out progressively and concurrent with the working phases, although at the end of extraction final restoration would take around 1-2 years.

2 Background – Climate Change and Cement Production

2.1 The Climate of the Earth and the Greenhouse[1] Effect

23 In any geological period, the climate of the planet Earth is modified by its atmosphere, a thin layer of gas around the planet. Incident electromagnetic radiation from the Sun in the visible and infrared spectrum warms the surface of the Earth, and infrared radiation is transmitted outwards from the surface, carrying heat energy. Certain minor gases (carbon dioxide and water vapour being mainly responsible) in the atmosphere have a capacity to absorb this radiation, retaining it in the atmosphere, a phenomenon called the 'Greenhouse Effect'. This effect maintains the average temperature of the surface 30-40°C higher than it would be without it, in a temperature range making most of the land area suitable for human habitation. The climate of the Earth locally is modified by oceanic and atmospheric circulatory systems which act to reduce the differences in temperature across land, water and the atmosphere. Changes in the average temperature of the Earth's surface alter these complex planetary systems. Man's contribution to altering these planetary systems is described as 'man-made climate change'.

2.2 Human Activities affecting the Composition of the Atmosphere

24 Human activities since the industrial revolution have increased the concentration of carbon dioxide in the atmosphere significantly, increasing from around 0.3% in 1990 now to about 0.4% (or 425 ppm) with a consequent effect on the average surface temperature, estimated to be an increase getting towards 1.5°C since pre-industrial times. Current global emissions of carbon dioxide from fossil fuels and industry are circa 38 billion tonnes per year[2], with 1.57 billion attributed to cement production.

25 Carbon dioxide is the main 'Greenhouse Gas'. When emitted, it remains in the atmosphere for decades, and its effect on the atmosphere is not influenced by its location of emission.

26 Whilst it is understood that the climate changes over geological time, the perceived risk of man-made climate change is from the rate of change being greater than that which can be readily adapted to by human and ecological systems without significant adverse impacts. The realisation of this global risk led to the establishment of an international set of agreements to manage it, which are described below.

[1] According to Wallace & Hobbs 'Atmospheric Science' (Academic Press, London, 1977) P.295 – "*This warming is commonly, but misleadingly, referred to as the "greenhouse effect." Greenhouses attain higher temperatures than the outside air primarily because the glass cover restricts the vertical movement of the air that is heated by solar radiation. Fleagle and Businger ("An Introduction to Atmospheric Physics," Academic Press, New York, 1963, pp. 153-154) suggest that trapping of the radiation by the earth's atmosphere be referred to as the "atmosphere effect*".

[2] Data Page: Annual CO_2 emissions from cement", part of the following publication: Hannah Ritchie, Pablo Rosado, and Max Roser (2023) - "CO_2 and Greenhouse Gas Emissions". Data adapted from Global Carbon Project. Retrieved from https://archive.ourworldindata.org/20250624-125417/grapher/annual-co2-cement.html

2.3 Making Cement and its GHG Emissions

27 The purpose of the development is to provide the minerals necessary for continued Ordinary Portland Cement (OPC) production at the Works.

28 OPC is made by heating calcium carbonate containing rock (typically limestone or chalk) with iron and aluminium silicate bearing minerals (typically clay or shale).

29 The carbon in the carbonate is 'fossil' and has not been in the global carbon cycle for millions of years.

30 The limestone is Jurassic Oolitic stone, formed from 201 to 143 million years ago by the precipitation of calcite in a shallow sea.

31 The production of cement clinker in the Works generates a substantial emission of the greenhouse gas ('GHG') carbon dioxide to the atmosphere, from the breakdown of fossil calcium carbonate in the limestone.

32 The Works is regulated for these emissions under the UK Emissions Trading Scheme, an emissions reduction initiative similar to mechanisms under the United Nations Kyoto Protocol.

33 The calcination reaction to drive off carbon dioxide from calcium carbonate (limestone) to form calcium oxide (lime) is as follows, and the carbon dioxide is emitted to the atmosphere:

$CaCO_3$ -> CaO + CO_2

34 In four different reactions, the lime reacts with silicates, aluminium oxide and ferric oxide, to produce di- and tricalcium silicate, tricalcium aluminate and brownmillerite. These are the active compounds in Ordinary Portland Cement. Cement is the binder in concrete and mortar, which hardens to bind the aggregates in them together by reacting with water.

35 The calcination reaction is thought to emit around 1.5 billion tonnes[3] of carbon dioxide a year from the production of 4 billion tonnes[4] of cement from over 5,000 cement works around the world. World total emissions[5] in 2023 were 54 billion tonnes CO_2e. The UK[6] was directly responsible for 384 million tonnes, total emissions across all sectors, including domestic, industry and agriculture. Industry (all UK industry not just cement) accounted for 52.8 million tonnes and the Ketton Works 0.51 million tonnes. Putting this in context Ketton Works contributed 0.0015% of total UK emissions or 1% of UK industry emissions.

36 In addition to the carbon dioxide from the calcination process, approximately 60-70% as much carbon dioxide again is emitted where fossil carbon-based fuel is burned to heat the raw materials. In general, the fuel used is coal, a fossil fuel, and therefore these emissions

[3] https://ourworldindata.org/grapher/annual-co2-cement?tab=chart&country=CHN~USA~IND~ZAF~AUS~OWID_WRL
[4] https://www.chathamhouse.org/2018/06/making-concrete-change-innovation-low-carbon-cement-and-concrete-0/executive-summary
[5] Hannah Ritchie, Pablo Rosado and Max Roser (2023) - "CO_2 and Greenhouse Gas Emissions" Published online at OurWorldinData.org. Retrieved from: 'https://ourworldindata.org/co2-and-greenhouse-gas-emissions' [Online Resource]
[6] https://assets.publishing.service.gov.uk/media/6604460f91a320001a82b0fd/uk-greenhouse-gas-emissions-provisional-figures-statistical-release-2023.pdf

add to the GHG emissions total. For Ketton Works, the reported split between materials and fuels is c.61% to 39% (see Appendix C.1).

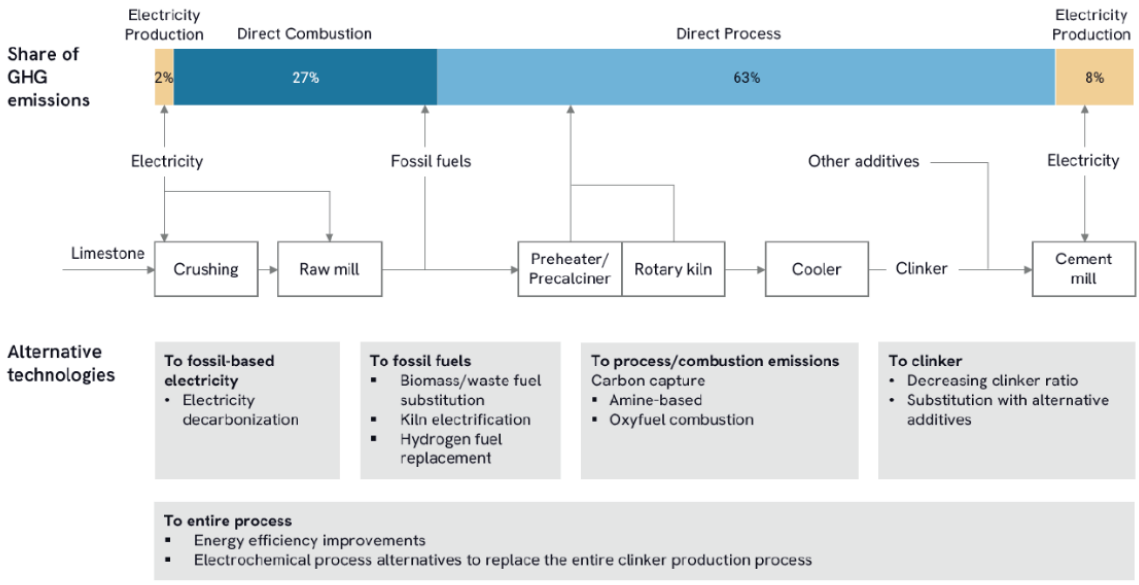
37 In Environmental Product Declarations[7], the Global Warming Potential (GWP) can be reported as 'net' or 'gross'. GWP, gross includes emissions from the combustion of waste-derived fuels. GWP, net excludes emissions from the combustion of waste-derived fuels. (see link to MPA EPD for the full explanation). In this report gross numbers are quoted.

38 Typically, in UK[8] cement works, direct emissions from cement plants are approximately 700 kg of CO_2e per tonne of Portland Cement equivalent. The average for the UK/EU and its trading partners is reported to be around 870 kgCO2e/tonne[9] for the gross emissions. At Ketton typically 90%+ alternative fuels are currently used in the cement manufacturing process.

2.3.1 Reducing Emissions from Cement

39 Figure 2.1 below illustrates the cement production process and cleaner alternatives. Outlined by the flow diagram through the centre of the figure are the process steps, a relatively uniform process globally. The associated global average emissions with each step are shown via the bar graph to the top of the figure, with arrows linking the GHG emissions and process activity. Alternative technologies are presented in grey, below the corresponding process step they are applicable to.

The cement production process and cleaner alternatives
Process steps, global average emissions contribution, and technology alternatives



Source: Rhodium Group

[7] Net/Gross definition from EPD-Average-CEM-I-Sector-EPD.pdf
[8] Mineral Product Association publication accessed 09/01/26. https://cement.mineralproducts.org/Sustainability.aspx
[9] See Figure 49 in 'Greenhouse gas emission intensities of the steel, fertilisers, aluminium and cement industries in the EU and its main trading partners' https://publications.jrc.ec.europa.eu/repository/handle/JRC134682 and its interpretation in the European Commission 'Default Values for the Transitional Period of the CBAM Between 1 October 2023 and 31 December 2025'.

Figure 2.1: The Cement Production Process and Cleaner Alternatives[10]

40 The ways to reduce and avoid the fossil CO_2 emissions associated with cement production include clinker substitution and fuel substitution. Clinker substitution can be with Pulverised Fuel Ash (a fossil fuel byproduct from coal combustion in power stations), Ground Granulated Blast Furnace Slag (a by-product from high fossil emission iron production) and ground limestone.

41 The substitution of coal with other fuels, including non-fossil fuels, is an on-going change at the Works (and in the EU cement industry) to reduce greenhouse gas emissions. Currently 90%+ alternative fuels are used.

42 End product cement must meet standard technical specifications, which constrains clinker substitution.

43 Fuel substitution can be with biomass and other sustainable fuels, but there are technical limitations since works are designed to use coal, which has a relatively high energy density.

44 The 'end-of-pipe' solution to virtually eliminate emissions is to capture the carbon dioxide (known as 'Carbon Capture') from the works chimney and store it in permanent underground geological storage.

2.3.2 Reducing Emissions – the UK in an International Cement Market

45 There are currently ten cement works in the UK. The last time a new OPC works was constructed in the UK was at Hope in 1929; Blue Circle abandoned plans to build a new works on the north Kent coast in the early 2000s. The large works which have closed since 1995 include Northfleet (Kent), Plymstock (Plymouth), Masons (Ipswich), and Westbury (Wiltshire).

46 The UK currently imports approximately 32% of its cement needs (2023 Mineral Products Association data, see Appendix C).

47 HM is a significant contractor to the UK central government and is therefore required to publish a PPN06/21 carbon reduction plan. This is a statement required by 'Procurement Policy Note 06/21[11]: Taking account of Carbon Reduction Plans in the procurement of major government contracts'. HMUK published its most recent plan at the end of 2025[12], and it includes the proposal for emissions reduction at all three of its works, including Ketton, by Carbon Capture and Storage (CCS).

48 CCS is in construction at the HM Padeswood plant, with a CO_2 pipeline planned for Liverpool Bay, as part of the government's Track 1 CCS cluster[13], HyNet. There are plans for a CCS 'Peaks Cluster' in the Peak District, collecting CO_2 from Hope, Cauldon and Tunstead cement works. The Ketton Works would be classed as a 'dispersed site', likely to use non-pipeline transport to carry CO_2 to geological storage.

[10] The Rhodium Group. https://rhg.com/research/the-global-cement-challenge/
[11] https://www.gov.uk/government/publications/procurement-policy-note-0621-taking-account-of-carbon-reduction-plans-in-the-procurement-of-major-government-contracts
[12] https://www.heidelbergmaterials.co.uk/en/ppn-0621-carbon-reduction-plan
[13] https://www.gov.uk/government/collections/uk-carbon-capture-usage-and-storage-ccus

49 The climate change impact of using various products, including building products, can be managed by the use of Environmental Product Declarations (EPDs), which use life cycle assessments to assess the environmental liabilities associated with their production. These EPDs state the 'embodied carbon' of the product, which is the quantity of CO_2e emitted for each declared unit of product.

50 In the Mineral Products Association report 'UK Concrete and Cement Industry Roadmap to Beyond Net Zero – Progress Report 2025'[14], it was reported that CO_2 emissions from cement AND concrete were estimated to be 6.6 million tonnes per year in 2023. According to estimates by DS, imported cement was responsible for another c.3 million tonnes of emissions outside of the UK, and cement use is responsible for emissions of c. 10 million tCO_2e/year.

51 As a sector, the Mineral Products Association helps to manage the climate change contributions of its members' products including cement, by publishing[15] EPDs for their materials. The current sector EPD for cement states an embodied carbon of 839.8 $kgCO_2e$/tonne (on the EPD as 'Global Warming Potential total'). The EPD for HM average UK CEM I cement[16] states 804.0 $kgCO_2e$/tonne. This is presented on the EPD as the

> *"Gross emissions (i.e. including CO_2 from combustion of proven wastes) are*
>
> *...*
>
> *804.0 kg CO2Eq. / t (GWP fossil)"*.

The draft EPD figure for CEM I cement produced from the Ketton Works is 705.0 $kgCO_2e$/tonne[17]. This will be submitted for verification in Q1 2026.

52 Regulating the 'embodied carbon' of cement presents a means by which governments may control the climate change impact of cements used within their jurisdictions, and the Carbon Border Adjustment Mechanism proposed to do this is described below.

[14] https://www.thisisukconcrete.co.uk/TIC/media/root/Resources/2025-09-15-CC-Roadmap-to-Beyond-Net-Zero-final.pdf
[15] https://www.environdec.com/library/collection/col100
[16] https://www.heidelbergmaterials.co.uk/sites/default/files/2024-08/environmental-product-declaration-bulk-cem-i.htm_.pdf
[17] The EPD will be published on the websites of HMUK and EPD Global.

3 Policy and Guidance

53 This section of the report provides the relevant policy and guidance context for the climate change assessment of the proposed development. The international and national legislation behind the policy and guidance for the climate change assessment is appended (Appendix B).

3.1 National Industrial Policy

54 Invest 2035 is the outline of the government's proposed industrial strategy[18]. This references plans for low carbon industrial development and the decarbonisation of the cement industry[19].

3.1.1 UK Carbon Border Adjustment Mechanism

55 The UK government has a policy to introduce a Carbon Border Adjustment Mechanism[20] to protect decarbonisation investments made in the UK. This means that imported cement will have a liability attached to it, to ensure that it does not undercut in price cement produced domestically which has decarbonisation costs added to it, through the Emissions Trading Scheme To each tonne of cement imported, the scheme will add the traded cost of a tonne of CO_2 under the UK ETS multiplied by either the certified emission factor for the cement, or a default factor, less any carbon tax/levy in the country of origin.

3.2 Company Policy

3.2.1 Corporate Policy

56 Heidelberg Materials makes this corporate statement on its website:

> *Heidelberg Materials is one of the world's largest integrated manufacturers of building materials and solutions with leading market positions in cement, aggregates, and ready-mixed concrete. We are represented in around 50 countries with around 51,000 employees at almost 3,000 locations. At the centre of our actions lies the responsibility for the environment. As the front runner on the path to carbon neutrality and circular economy in the building materials industry, we are working on sustainable building materials and solutions for the future. We enable new opportunities for our customers through digitalisation.*

57 In terms of significant international carbon reduction projects, recent examples include:

- Full scale carbon capture plant on the HM cement works in Brevik, Norway.

[18] https://www.gov.uk/government/consultations/invest-2035-the-uks-modern-industrial-strategy/invest-2035-the-uks-modern-industrial-strategy
[19] https://www.gov.uk/government/news/government-reignites-industrial-heartlands-10-days-out-from-the-international-investment-summit
[20] https://www.gov.uk/government/consultations/addressing-carbon-leakage-risk-to-support-decarbonisation/outcome/factsheet-uk-carbon-border-adjustment-mechanism

- Scaling up low-carbon clinker alternatives: HM has started production at the world's largest calcined clay plant in Ghana, with a capacity for 400,000 tonnes per year.

- Planning consent and funding allocated for the carbon capture scheme at Padeswood cement works, Cheshire, UK (case reference DNS CAS-02009-W1R1Z7[21] - Padeswood Carbon Capture & Storage).

3.2.2 HM UK - PPN06(21) Statement – January 2026

58 Owing to the government's Net Zero target, to aid achieving this target, the government has published guidance to take account of suppliers' Net Zero Carbon Reduction Plans in public procurement. The document requires large suppliers in government contracts to publish their Scope 1, 2 and 3 emissions for a baseline year, the current reporting year, and to make a statement on their emissions reduction targets. The GHG Protocol classifies GHG emissions using three categories, labelled "Scope 1", "Scope 2" and "Scope 3", these are further explained in Appendix A. HM is a large-scale supplier of materials to the UK government and has a published statement on the entity's Carbon Reduction Plan (CRP)[22], most recently in January 2026. The plan reports Scope 1, 2 and 3 emissions for 1990 and 2023 (Table 3.1).

Table 3.1: PPN06 2024 Emissions Data for 2016 and 2023

Emissions (tCO_2e)	2016	2024
Scope 1, direct emissions (gas oil etc)	1,986,423	1,615,430
Scope 2, indirect emissions (electricity)	203,049	3,285
Scope 3 (estimate)	456,877 (estimate)	327,995 (Categories 4, 5, 6, 7 and 9)
Total	2,646,349	1,946,463

59 For the Scope 3 (indirect emissions not directly under control of HM) Category 4 is Upstream Transportation and Distribution; 5 is Waste Generated in Operations; 6 is Employee Commuting; 7 is Business Travel; and 9 is Downstream Transportation and Distribution.

60 To continue their progress towards achieving net zero, HM has adopted the following targets, which are also part of their 2030 commitments:

- Scope 1 emissions: 15% reduction by 2030 (baseline: 2016)

- Scope 2 emissions: 65% reduction by 2030 (baseline: 2016)

61 The CRP lists numerous Carbon reduction projects, of which the most relevant are the following:

Cement

evoZero carbon captured near-zero cement

[21] https://planningcasework.service.gov.wales/case
[22] https://www.heidelbergmaterials.co.uk/en/ppn-0621-carbon-reduction-plan

Heidelberg Materials is the world's sole supplier of carbon captured near-zero cement, evoZero, which is available in the UK. It is produced at the company's cement works in Brevik, Norway, where the world's first carbon capture facility at a cement works was completed in June 2025. The carbon capture facility captures around 400,000 tonnes of CO_2 per year, equalling 50 per cent of the plant's emissions. Once captured, liquefied CO_2 will be transported by pipeline to the storage site under the North Sea, where it will be permanently stored as part of the Norwegian government's Longship carbon capture and storage project.

Carbon capture and storage (CCS)

Following the successful completion of a funding agreement with the UK Government in September 2025, Heidelberg Materials' Padeswood CCS project in north Wales has entered the execution phase. Padeswood is to become the world's first cement plant with a fully decarbonised cement production process: the facility is designed to capture around 800,000 tonnes of CO_2 annually. Carbon capture and storage (CCS) does exactly what it says – capturing carbon dioxide produced during cement manufacture before it enters the atmosphere, transporting it by pipeline, and storing it safely under the seabed. It is a safe and proven technology that has been around for many years, and our CCS project at Padeswood is a stepping stone to decarbonising the UK construction industry.

Hydrogen fuel feasibility study

In a successful world-first trial carried out in 2021, we demonstrated the use of a net zero fuel mix at our Ribblesdale cement plant using hydrogen technology. The trial, made possible by funding through the former Department for Business, Energy and Industrial Strategy (BEIS) provided through the Mineral Products Association (MPA), used a mix of 100 per cent net zero fuels – including hydrogen – to successfully operate a cement kiln. During the demonstration, the proportion of fuels in the cement kiln's main burner was gradually increased to a wholly net zero mix, which included tanker delivered hydrogen, demonstrating a pathway to moving away from using fossil fuels in cement production. The success of the trial was confirmed by the results of an academic research study carried out in 2024. If the use of a wholly net zero fuel mix were to be fully implemented for the whole kiln system, we could save nearly 180,000 tonnes of CO_2 emissions each year at Ribblesdale alone. Unfortunately, hydrogen storage and transportation are technically challenging and, at present, economically unviable, presenting a major challenge.

Novel carbon capture technology

We have successfully completed a feasibility study and demonstrator trial using C-capture technology at our Ketton cement works. The project was part of C-Capture's national XLR8 CCS project, which demonstrated that its

next generation carbon capture solution can be used in hard to abate industries. It uses a solvent to selectively capture CO_2, which can then be compressed and sent for storage in safe, geological reserves or used in other areas such as the fertiliser and oil and gas industries. The process requires 40 per cent less energy than other carbon capture technologies, creating an opportunity for significant energy savings. We continue to investigate and support developing carbon capture technologies with the long-term aim of developing resource efficient full scale carbon capture.

3.3 Guidance Documents

3.3.1 Planning Practice Guidance: Climate Change (2019)

62 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[23] 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.

3.3.2 The Institute of Environmental Management and Assessment (IEMA) Guidance

63 The guidance used in this climate change assessment to assess greenhouse gas emissions associated with the proposed development was produced by The Institute of Environmental Management and Assessment (IEMA)[24].

64 IEMA published guidance in 2015, revised in 2020, 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'[25] guidance has been used to inform this assessment.

65 Relating specifically to the assessment of GHGs within the EIA, IEMA published the 'Institute of Environmental Management & Assessment (IEMA) Guide: Assessing Greenhouse Gas Emissions and Evaluation their Significance'[26] 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. A limitation of the IEMA guidance is that it is framed around buildings and infrastructure and not around production facilities i.e. industrial works which make products. To remedy this, consideration is given

[23] Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government. (2019), 'Planning Practice Guidance: Climate Change'. Accessible online at: https://www.gov.uk/guidance/climate-change
[24] IEMA rebranded to the Institute of Sustainability and Environmental Professionals (ISEP) in July 2025
[25] Institute of Environmental Management and Assessment. (2020), 'Environmental Impact Assessment Guide to: Climate Change Resilience & Adaption'
[26] Institute of Environmental Management and Assessment. (2022), 'Institute of Environmental Management & Assessment (IEMA) Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance' 2nd Edition

to the carbon intensity of the product from the works, because that is one of the main means by which the cement industry manages its climate change emissions.

66 A further complication in assessing the emissions from cement production is that UK producers may not disclose cement production and sales volume data due to an order from the Competitions and Markets Authority[27]. For this reason, recent information published by the MPA (see Appendix) has data marked as 'EXCLUDED'. Probably related to this, the source countries of imported cement are suppressed in government published data[28]. The relevant code for cement is 25232900. This means that there is no information readily available by which estimates of the carbon intensity of imported cement may be made.

[27] https://assets.publishing.service.gov.uk/media/611e7798e90e0705445c3e4a/UPDATED_190821_cement-market-data-remedy-undertakings_mpa.pdf
[28] Import data suppressions are listed here: https://www.uktradeinfo.com/trade-data/current-suppressions/; the suppressions policy is set out here: https://www.uktradeinfo.com/trade-data/suppressions-policy/

4 Methodology

67 This section sets of the report sets out the methodology followed for the climate change assessment.

4.1 Assessment Method

68 The assessment is made with reference to the IEMA guidance and the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard (2004) ('GHG Protocol').

69 The assessment considers the baseline, and the future scenario:

Do Something with scheme (quarrying and therefore cement production continues to c.2060).

70 The proposed scheme is presented and significance is assessed, with reference to the IEMA significance criteria. A Do Nothing scenario and mitigation scheme are evaluated but not assessed.

Table 4.1: IEMA Framework for assessment of significant effects

Significance	Level	Criteria
Significant	Major Adverse	Project adopts a business-as-usual approach, not compatible with the national Net Zero trajectory, or aligned with the goals of the Paris Agreement (i.e., a science-based 1.5°C trajectory). GHG impacts are not mitigated or reduced in line with local or national policy for projects of this type.
	Moderate Adverse	Project's GHG impacts are partially mitigated, and may partially meet up-to-date policy; however, emissions are still not compatible with the national Net Zero trajectory, or aligned with the goals of the Paris Agreement.
Not significant	Minor Adverse	Project may have residual emissions, but the project is compatible with the goals of the Paris Agreement, complying with up-to-date policy and good practice.
	Negligible	Project has minimal residual emissions and goes substantially beyond the goals of the Paris Agreement, complying with up-to-date policy and best practice.
Significant	Beneficial	Project causes GHG emissions to be avoided or removed from the atmosphere, substantially exceeding the goals of the Paris Agreement with a positive climate impact.

4.2 Scope of the Assessment

71 The Climate Change Assessment considers the net emissions which will arise as a result of the works comprised in the Application and, because the minerals extracted will supply the Works, and the new road provides access to the Works, the GHG emissions from the Works, as an effect of the works comprised in the Application.

72 The forecast emissions are also estimated on an absolute tonnage basis, for the approach to be consistent with the legal cases of Finch and West Cumbria Coal.

73 The emissions from the activities (e.g. road construction) to enable the mineral extraction, are considered for the assessment, despite being likely to be insignificant in comparison with the emissions from the cement works itself.

74 For the GHG aspect of this assessment, the study boundary is the Site and the Works, considered in the context of the UK cement market.

4.2.1 Defining the Scope

75 The IEMA Guide for Greenhouse Gas Assessment considers a built asset or piece of infrastructure to illustrate how to define the scope of a project. The asset life cycle is divided into four module stages: 'before use', 'use', 'end of life' and 'beyond asset life cycle'. A consented quarry is a finite natural resource body, producing a tangible product, and creates a void which can also be an asset of a finite lifetime. Owing to the proposed development being an extension of the use of existing quarry and Works infrastructure i.e. roadways, conveyors, crushers, cement plant etc, the focus of the assessment is on the 'use' phase of the quarry extension, with a consideration of 'before use' and 'benefits and loads beyond the system boundary'.

76 The temporal scope of the assessment is the lifetime of the proposed development for which planning consent is being sought, which is for the quarry to be expected to operate until 2060.

77 The Climate Change Assessment considers the aspects of operations associated with the proposed development giving rise to greenhouse gas emissions, both directly on Site and indirectly off Site, related to the Works. Absolute emissions are estimated to inform the assessment against local and national policy.

78 A recent quarry planning application in Northumberland was quashed[29] partly on the basis that the applicant had not assessed the potential emissions from soil handling. As a consequence, the potential for losses from soil carbon for this project were considered with reference to published practice[30] and research[31]. The research cited shows that soil organic carbon stocks are relatively stable even under relatively gross interventions such as ploughing and cropping, and the magnitude of emissions (quoted in tonnes per square kilometre) is not large, and the process is not fast, relative to other activities assessed. Current map data indicates that the site contains approximately 9,000 tonnes of soil carbon[32]. Provided that the best practice set out in the Environmental Statement is applied in managing the soils disturbed on site, soil carbon should be maintained and the impact minimised. An assessment of this impact is made.

[29] https://elflaw.org/past-cases/northumberland-quarry/
[30] https://assets.publishing.service.gov.uk/media/667ad8204ae39c5e45fe4c13/lulucf-local-authority-report-2022.pdf
[31] Moxley, J, Anthony, S, Begum, K, Bhogal, A, Buckingham, S, Christie, P, Datta, A, Dragosits, U, Fitton, N, Higgins, A, Myrgiotis, V, Kuhnert, M, Laidlaw, S, Malcolm, H, Rees, B, Smith, P, Tomlinson, S, Topp, K, Watterson, J, Webb, J & Yeluripati, J 2014, *Capturing Cropland and Grassland Management Impacts on Soil Carbon in the UK LULUCF Inventory*. Department for Environment, Food & Rural Affairs. <http://nora.nerc.ac.uk/id/eprint/508474/>
[32] UK Soil Observatory, using the layer 'CS Topsoil Carbon - Carbon Density' https://mapapps2.bgs.ac.uk/ukso/home.html

4.2.1.1 IEMA Guidance on the system boundary

79 The IEMA guidance recommends consideration of 'the benefits and loads beyond the system boundary', which for a project producing a product means the use of the product and the context in which it is used. The context of the cement use is the UK cement market, of which a large part (circa 32%) is supplied by imports. The use of cement resulting from the project is mostly in concrete. The project downstream products will be part of existing or future built and infrastructure assets (e.g. buildings, roads, railways, airports) but their attributable emissions are not readily calculable, because, as an example, it is not obvious how much of the emissions from the use of a building should be attributed to the cement used to construct it. It is also not known what type of infrastructure assets the cement will be used in. Emissions from downstream uses have been scoped out of this assessment.

4.2.1.2 National GHG Inventory and Budgets

80 The national and local emissions inventories for previous years are published by the government. The latest fully-published inventory of 2022 had a national emission of 406 million tonnes CO_2e, of which the industrial sector was 67 million tonnes. As a national average, industrial emissions were 17% of the UK emissions in 2022.

81 In 2022, Ketton works contributed 670,000 tonnes[33], or c.1% of the total for UK industry[34] (note that the Works emission varies from year to year, and 2022 was different to 2023). Since the works is one of ten cement plants serving the UK nationally, the appropriate context for consideration is the UK national industrial inventory, and cement use.

82 Cement use in the UK is estimated to be responsible for emissions of c. 10 million tCO_2e/year, based on data from 2021-3, of which c.3 million (see Table C2 in Appendix C) are related to imports, and therefore not recorded in the UK national inventory.

Table 4.2: Sector breakdown as a proportion national percentage (2022)

Sector	National %
Industrial	16.6
Commercial	9.0
Public Sector	3.1
Agriculture	13.2
Domestic	22.4
Transport	30.5
Waste	5.0
LULUCF	0.2
Total	**100**

[33] From UKETS report for 2022. See Appendix C1.
[34] https://www.gov.uk/government/statistics/uk-local-authority-and-regional-greenhouse-gas-emissions-statistics-2005-to-2022

Table 4.3: UK total and inferred UK Industrial carbon budgets

Carbon Budget	National Million tonnes CO_2e	National Industrial Million Tonnes CO_2e
1st (2008 – 12)	3,018	501
2nd (2013 – 17)	2,782	461
3rd (2018 – 22)	2,544	422
4th (2023 – 27)	1,950	323
5th (2028 – 32)	1,725	286
6th (2033 – 37)	965	160

83 Table 4.3 shows the 5 year carbon budgets, with the inferred national industrial budgets presented as a fixed percentage of the total, up until 2037.

84 There are no correspondingly detailed or legally binding budgets published for the UK cement sector. In 2015, the government published 'The Industrial Decarbonisation & Energy Efficiency Roadmaps to 2050 – Cement[35]', which is a top-down analysis evaluating various scenarios. The UK Concrete and Cement industry's roadmap[36] again is not detailed in the same way as the UK national budgets, but indicates step reductions in 2023, 2030, 2040 and 2050 in broad terms. The HMUK PPN06-21 document is the developer's quantitative 'roadmap'.

4.3 Assessment Uncertainties, Limitations and Assumptions

85 DustScanAQ accepts no responsibility for any inaccuracies in third-party data. The climate change assessment is based upon past operational Scope 1 and Scope 2 emissions and tonnes of extracted material, as well as current and future projections of extracted material and cement production annually. Predictions are based upon averages as exact amounts of material production will likely vary year to year. The uncertainty associated with the emissions predictions will increase the further they are into the future. Precise emissions estimates from a range of scenarios are presented. The uncertainty around the figures is significant, because they are predictions of the possible outcomes of complex future policy and economic factors. The range of the emissions estimates can be used as a guide to their uncertainty.

[35] https://assets.publishing.service.gov.uk/media/5a8046d5e5274a2e8ab4f37d/Cement_Report.pdf
[36] UK Concrete and Cement Industry Roadmap to Beyond Net Zero, Progress report 2025, MPA, UK Concrete, page 12, figure 'Decarbonisation trajectory to 2050'.

5 Results

5.1 Baseline Mineral Extraction & Cement Production

86 The baseline of greenhouse gas emissions was provided to DS by the client for the existing operation, with details of the tonnage of stone extracted and verified emissions for cement production. HM is actively working on reducing its emissions and has centralised data collection and reporting.

5.1.1 Baseline Mineral Extraction

87 Greenhouse gas emissions associated with the quarry are reported in tonnes of CO_2 equivalent (CO_2e). This approach considers the varying global warming potentials of the different greenhouse gases associated with global warming; however, carbon dioxide is the only GHG contributing to the CO_2e figures in this report.

88 The greenhouse gas emissions have been calculated using the activity data (Scope 1 and Scope 2 emissions) and emissions factors published by Defra for each activity[37] for the quarry extraction. It should be noted that HM purchases renewable electricity and therefore electricity consumption is factored by zero.

GHG Emissions = Activity Data x Emission Factor

Table 5.1: Baseline 2021 to 2023 Activity data for Ketton quarry operation

Emission related activity	2021	2022	2023
Scope 1, direct emissions (gas oil, litres)	824,158	845,590	903,404
Scope 2, indirect emissions (electricity, kWh)	1,926,340	1,618,927	1,710,000

89 Table 5.1 shows the activity data per year for quarry extraction for the site for 2021 to 2023.

Table 5.2: Baseline Greenhouse Gas Emissions in tonnes CO_2e (Quarry)

Activity	2021	2022	2023	Average
Quarry	2,274	2,333	2,489	2,365
Quarry, kgCO2e/tonne	1.21	1.45	1.46	1.37

90 Table 5.2 shows that the emissions associated with the quarry are around 0.3% of the total emissions: they are insignificant[38] when compared with the emissions from the Works. The average emission per tonne is 1.37 $kgCO_2e$/tonne, which is lower than the industry average for crushed rock, at 3.15 $kgCO_2e$/tonne[39].

[37] Annual conversion factor publications accessible at: https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting
[38] The IEMA guidance suggests that sources which contribute less than 1% of the project total may be excluded
[39] Sourced from the Mineral Products Association 'Sustainability Report 2022'

5.1.2 Baseline Cement Production

91 The emissions of carbon dioxide from the production of cement clinker are regulated under the UK ETS permit, and verified and reported under that scheme. The contributing fuels, materials and sources to the overall emission are more complex and a fuller description of them is appended. The activity data for cement production cannot be published due to the CMA order.

Table 5.3: Greenhouse Gas Emissions in tonnes CO_2e (Works)

Activity	2021	2022	2023	Average
Works	732,294	670,145	514,595	639,011

Note: The Works emission is presented as tCO_2e for simplicity, although the UKETS emission reporting does not include non-CO_2 GHGs. The works emissions are those reported to UKETS.

5.2 Future Mineral Extraction and Cement Production

92 A conservative ('reasonable worst case', as per the IEMA guidance) scenario is presented to estimate the future absolute emissions, based on site-specific data and industry averages, and demand remaining constant::

- Do Something (with scheme, production ceases in 2060, emissions held constant at baseline site data, renewable electricity)

5.2.1 Future Mineral Extraction

93 Enabling works will be required for the proposed mineral extraction. The most significant aspect of these works will be the proposed road.

94 The emissions resulting from the construction of a new site access road located to the west of the quarry have been assessed. This road will enable HGV movements from the quarry to the A606 to the north. The proposed development is approximately 3.3 km long and 7.5 m wide and will be constructed over a combination of previously worked land and agricultural land. Carbon emissions were calculated using the National Highways Carbon Tool[40], which calculates the carbon emissions released during the construction phase of a road. The Design Manual for Roads and Bridges (DMRB) standards were used to identify appropriate materials and construction specifications. The primary materials used in the calculations included asphalt and bitumen, aggregate, and geotextiles, which together provide the necessary structure and strength for the proposed development. Material quantities were estimated using industry-standard calculators. The Heidelberg Materials Calculator[41] was used to determine the tonnes of asphalt (AC Dense Surface, Base, and Binder courses), based on a depth of 150 mm, a width of 7.5 m, and a length of 3,337 m. The Holcim Aggregates Calculator[42] was used to estimate the tonnes of aggregate needed, using a depth of 500 mm with the same width and length. The National Highways Carbon Tool also accounts for emissions generated during the transport of materials from the supplier to the construction site. Where supply distances are unknown, the tool assumes a default distance

[40] National Highways Carbon Emissions Calculation Tool. Accessible at: https://nationalhighways.co.uk/suppliers/design-standards-and-specifications/carbon-emissions-calculation-tool/
[41] Heidelberg Materials. Accessible at: https://www.heidelbergmaterials.co.uk/en/tools/asphalt-calculator
[42] Holcim Aggregate & Gravel Calculator. Accessible at: https://www.holcim.co.uk/digital-tools/aggregates-calculator

of 50 km by road for locally sourced asphalt, earth, or aggregate. Geotextiles were also included in the emissions estimate as a standard component in road construction. The total predicted carbon emissions associated with the materials for the proposed road are 702 tCO_2e.

95 The soil on the land to be worked is a store of carbon, which will be affected by the proposed development. A report by Land and Research Associates[43] surveyed the proposed quarry extensions and identified four main soil resources consisting of two topsoils and two subsoils. The topsoil is mainly of clay and clay loam, found across large parts of the southern block (Field 14) and in areas of the northern block (NW Field). Beneath the topsoil the subsoil varies between limestone and areas of deep clay.

96 To calculate the carbon in the soils in the areas of mineral extraction and the development of the proposed new access road, carbon density (t/ha^{-1}) data was taken from the British Geological Survey's UK Soil Observatory map[44]. Carbon density values were taken from the Countryside Survey topsoil maps, produced by the Centre for Ecology & Hydrology, using data collected at a depth of 15 cm during national surveys conducted in 1978, 1998, and 2007.

97 The proposed extraction site of the NW Field, Field 14 and the new access road cover an area of approximately 169.7 ha and all had a carbon density of 51.63 (t/ha^{-1}), according to the most recent Countryside Survey. This results in the total area containing approximately 8760 tonnes of carbon, or 32,120 tCO2e.

98 To minimise carbon release from soils and reduce emissions to the atmosphere, best practice should be followed as set out in the 'Good Practice Guide for Handling Soils in Mineral Works'[45]. During soil stripping, the construction of storage mounds and soil replacement, several key considerations must be addressed. Operations should avoid periods when soils are wet or in a plastic state. Compaction caused by machinery trafficking and soil wetness should be minimised. Where compaction or other adverse effects occur, appropriate remedial treatments should be implemented to restore soil structure. Furthermore, measures should be taken to minimise soil loss and prevent the mixing of different soil layers or types. Provided these measures are applied, which it is understood they are intended to be, then there is no significant increase in GHG emissions estimated from the soil handling. Since arable agriculture is responsible for the systematic loss of soil carbon year on year[46], taking the land out of arable production could be considered to halt this process.

99 The quantum of embodied carbon for the materials for constructing the road is well below the IEMA materiality threshold of 1% when compared with the Works emissions, and the

[43] Rutland County Council, Planning Application Documents – Soil Resources and Agricultural Quality Report. Accessible at: https://publicaccess.rutland.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=RPPPW9NN00900
[44] British Geological Survey, UK Soil Observatory map. Accessible at: https://mapapps2.bgs.ac.uk/ukso/home.html
[45] Institute of Quarrying, 'Good Practice Guide for Handling Soils in Mineral Workings' (2021). Accessible at: https://www.quarrying.org/soils-guidance
[46] The State of the Environment: Soil; Environment Agency, 2019.

estimates are not developed further. Carbon mitigation methods for constructions of this type are well-developed and can usefully be applied to constructing the road.

100 The emissions associated with the future mineral extraction are tabulated in Table 5.4.

5.2.2 Future Cement Production on site

101 For the purposes of this assessment, the amount of cement clinker-related emission from the proposed development is estimated to be the same as that declared in the HM EPD for CEM I cement, of 705 $kgCO_2e$/tonne.

Table 5.4: Projected total GHG emissions for Proposed Development from 2026 onwards

Scenario	IEMA Life Cycle Module	Activity	GHG Tonnes
Do Something – With Scheme – emissions constant 2026 to 2060	A - Before Use	Enabling Works	702
	B - Use	Quarry	82,779
	B - Use	Works	24,675,000
	Total		24,758,481

102 The GHG emissions for the Proposed Development (Do Something) have been assessed for their absolute emissions for cement production. The future projected emissions for the proposed scheme are 24.7 million tonnes. This includes 4.9 million tonnes emitted from exploiting the currently consented reserves up to 2032.

103 The quarry emissions are likely to be lower in reality than estimated here, due to the introduction of zero-emission Non-Road Mobile Machinery in the project lifetime.

104 Consideration has been given to emissions associated with the downstream transport of the cement product. In the near future these would be under 2% of the annual project emission, due to fall away further into the future with the projected decarbonisation of road and rail transport. Transport emissions are not quantified in detail here because their consideration will not alter the outcome of the assessment. Transport decarbonisation[47] will be driven by government policy and legislation which has not yet been set out in detail.

5.2.3 Future Cement Supply without on-site Production

105 Consideration as to what will happen in the future without the scheme in place. This is defined as Do Nothing (no development, production ceases in 2032, emissions held constant at baseline average, renewable electricity, production is substituted at the estimated CBAM rate until 2060). This relies on an assumption that demand for cement

[47] https://assets.publishing.service.gov.uk/media/610d63ffe90e0706d92fa282/decarbonising-transport-a-better-greener-britain.pdf

from the Works is replaced by imports at an estimate for the EU CBAM rate[48], if development consent is not granted. This should be regarded as an upper-end estimate of potential emissions, since over the course of the lifetime of the scheme, lower emission cements are likely to become available and this figure would then be lower. It has not been possible to generate a range estimates of the effect of substitution of the Ketton production on emissions from UK cement use with any confidence, for different reasons including the lack of published data on import sources and the lack of detailed modelling of emissions reductions into the future. Comparable cement from any other source in operation is likely to generate a similar, and significant, quantity of $CO2_e$.

Table 5.5: Projected total GHG emissions for comparable scenarios from 2026 onwards

Scenario	IEMA Life Cycle Module	Activity	GHG Tonnes
Do Nothing – no development - same as baseline to 2032, then substituted production at CBAM rate to 2060	B - Use	Quarry	16,556
	B - Use	Works	4,935,000
	D - External	Substituted Production	24,360,000
	Total		29,311,556

5.3 Mitigation – Cement Production on Path to Net Zero

106 Mitigation for the cement works emissions may be provided in the future by the installation of Carbon Capture and Storage for the Works, subject to government business models to support it, HM business strategy, and consented planning permission. Currently HM states in its PPN06 that CCS is targeted for 2037.

107 For the purposes of this assessment the likelihood of this is considered to have a low level of certainty, because it relies on further planning consent(s) and government interventions including the government confirming the business models for the engineered carbon removals[49].

108 CCS has the potential to significantly reduce to a minimum the Works emissions but this is not assessed with respect to the trajectory to net zero because CCS is outside the scope of the quarry project.

[48] Taken from 'Default values for the transitional period of the CBAM between 1 October 2023 and 31 December 2025' European Commission, 22 Decembet 2023. Table 2.3 Cement, CN Code 2523900 Other Portland Cement, 0.87 tonne CO2e/tonne goods.
[49] https://www.theccc.org.uk/publication/progress-in-reducing-emissions-2025-report-to-parliament/

5.4 Project Emissions Summary and Assessment

109 The total emissions estimated for the project are presented in the table below and should be considered upper-bound estimates. These include emissions from mobile plant on Site to extract the mineral and the emissions from the Works, and relevant emissions external to the project. No estimate is made of the mitigation likely with government Net Zero policy, which would need to account for reductions through the replacement of diesel-powered road and Non-Road Mobile Machinery by alternatively powered machinery through the project lifetime.

110 These emissions estimates arise from and are based on using current diesel-powered road and non-road machinery, not reduced over time. New fuels and technologies are either available now, or are expected to become available to avoid these emissions in the medium term.

Table 5.6: Project Emissions compared with Cement Production Emissions to Supply UK Demand on the same basis, 2033 to 2060 – 28 years (tCO_2e)

Source	Estimated Emissions
Quarry and Works Emissions	Up to 19,800,000
Total Emissions Associated with UK Cement Demand	Up to 258,000,000[50]

111 The IEMA Guidance says that '*the crux of significance therefore is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050.'*

112 With reference to the statement on significance, the project emits GHG emissions and the magnitude of emissions is large. It is difficult to assess against the trajectory to net zero by 2050 without speculation, because the 'trajectory' involves various circumstances falling into place in the next 25 years, and the industry emissions reduction roadmaps are not legally binding. The project considered on its own does not 'contribute to reducing GHG emissions… consistent with a trajectory towards net zero by 2050', unless other development mitigation takes place in accordance with these plans and initiatives:

a. The UK Industrial Strategy Invest 2035;

b. The effective take-up of the government's carbon capture, usage and storage (CCUS) business models[51];

c. The UK Concrete and Cement Industry MPA Roadmap to Beyond Net Zero;

d. The Heidelberg Roadmap to Net Zero;

e. HMUK PPN06, dated 2025.

[50] This is UK cement demand emissions at 10 million tonnes/year, less the emissions from Padeswood CCS
[51] https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models

113 Considered on their own, only within the UK, with the scheme in place, the quarry and works will emit approximately up to an additional 19.8 million tonnes of CO_2e over those from the currently consented works, over the life of the project. This is the 'reasonable worst case' advised to be assessed in the IEMA guidance. On this basis, the impact of future operations on GHG emissions at the site are assessed to be major adverse impact and to have a significant impact, with reference to the criteria set out in Table 4.1.. The outline plans described in the previous paragraph should in due course mitigate this effect.

114 It would be misleading to conclude that if the project does not proceed, that some or all of these emissions will be avoided, because it is very likely that some or all of these emissions will occur from production elsewhere, since government policy supports economic growth and with it the demand for cement. Considered in the context of the UK cement market and emissions globally, assuming substituted production at the CBAM rate to replace the loss of this site's production, the continuation of the quarry and Works could result in a net reduction of emissions of up to 4 million tonnes. Compared to the generic CBAM rate, allowing the quarry to continue to 2060 would result in lower emissions. As set out above, it has not been possible to develop any other estimate of substituting supply from the project with any confidence.

115 Beyond the planning system, the cement industry is already impacted by climate change legislation and financial burdens intended to promote the use of low carbon construction products. It is therefore likely that market forces will encourage decarbonisation to reach net zero by 2050. On that basis the worst-case scenario for the project emissions is likely to overstate the actual effects of it.

5.5 Climate Baseline and Future Projections

116 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.

117 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.

118 For the climate baseline conditions at Grange Top Quarry historical data[52] provided by the Met Office was utilised. The data from the period 1991 – 2020 has been taken from the closest meteorological station at Wittering (Peterborough) which lies approximately 7.2 km to the southeast of Grange Top Quarry, as seen in Figure 5.1.

[52] https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcrem99cb

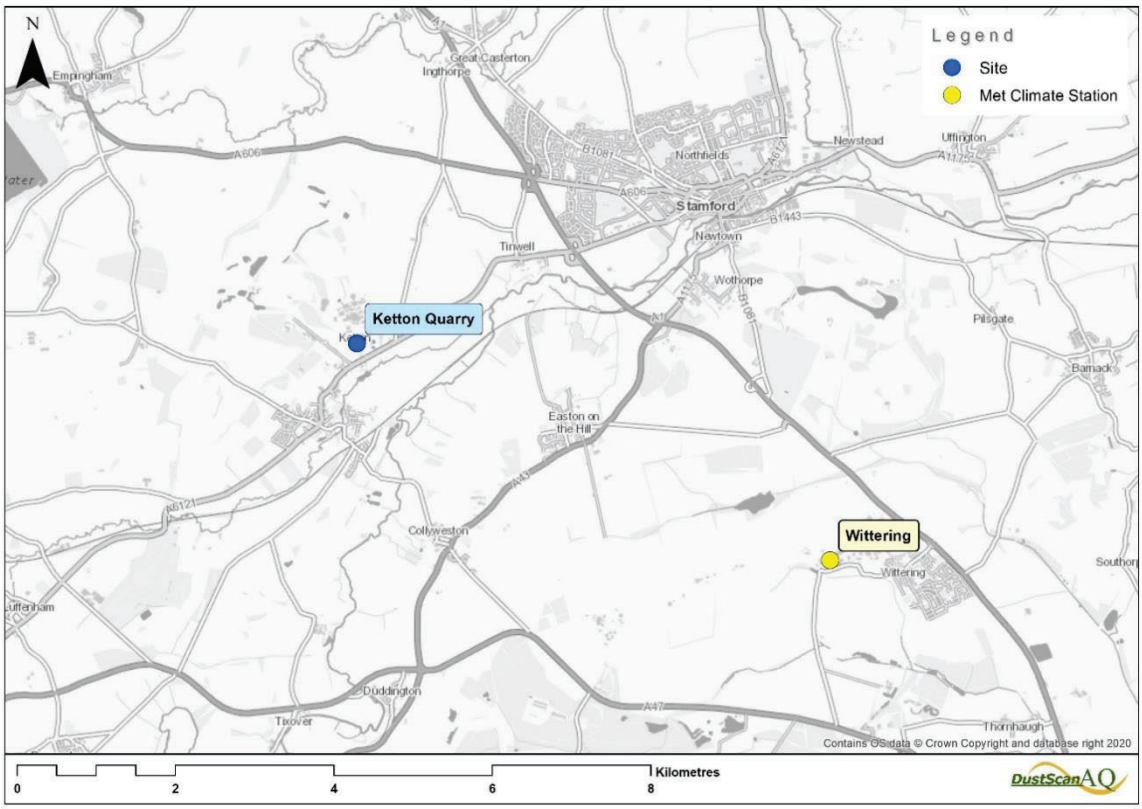


Figure 5.1: Wittering Met Office weather station in relation to Grange Top Quarry and proposed extension

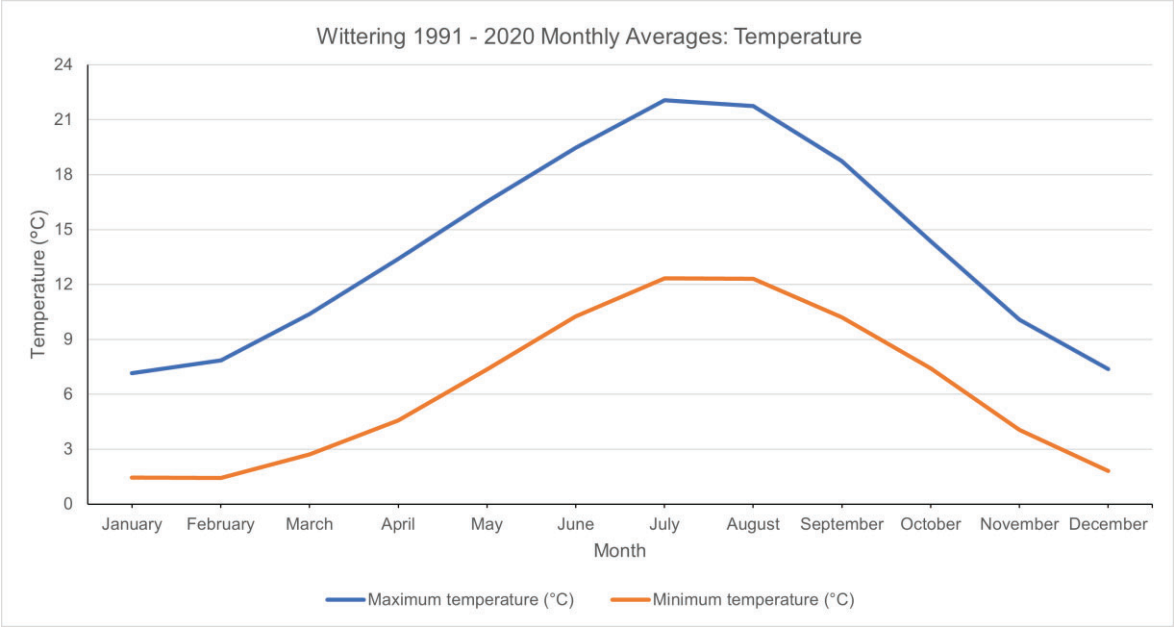


Figure 5.2: Maximum and minimum monthly averages, Wittering

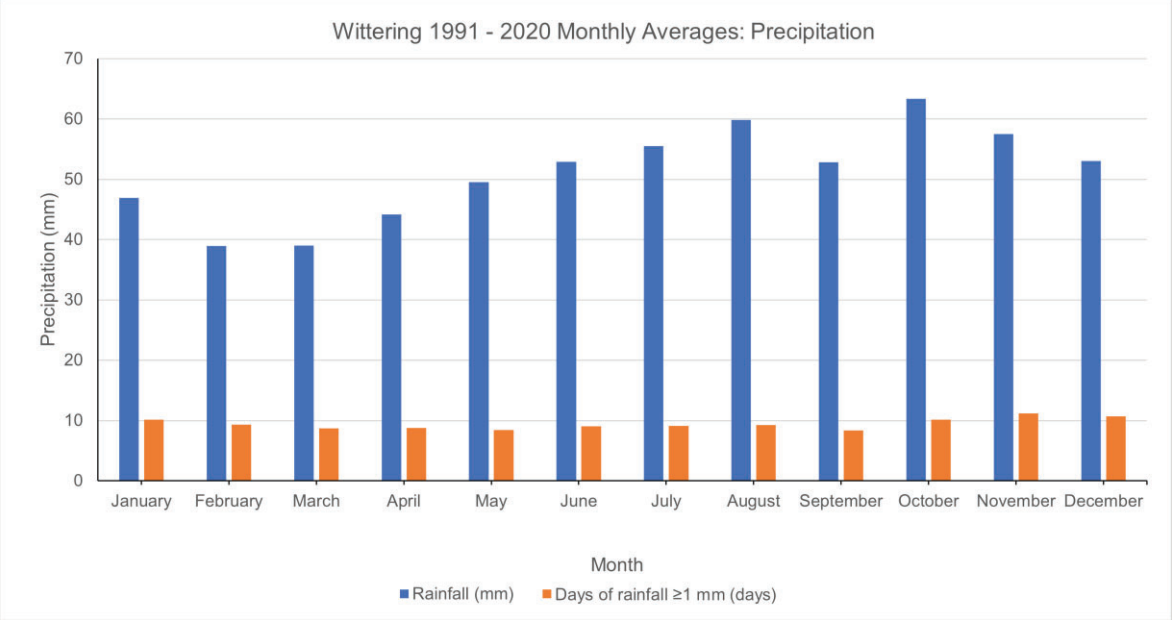


Figure 5.3: Monthly average rainfall, Wittering

Table 5.7: Temperature and precipitation averages 1991 – 2020, Wittering

Month	Max temp °C	Min temp °C	Rainfall (mm)	Days >1mm rainfall
January	7.14	1.45	46.96	10.13
February	7.86	1.42	38.92	9.33
March	10.38	2.72	38.99	8.73
April	13.39	4.57	44.15	8.77
May	16.51	7.35	49.55	8.43
June	19.46	10.25	52.91	9.03
July	22.07	12.33	55.51	9.13
August	21.74	12.3	59.86	9.23
September	18.73	10.21	52.85	8.33
October	14.36	7.43	63.34	10.17
November	10.08	4.04	57.5	11.17
December	7.37	1.8	53.01	10.67
Annual	**14.12**	**6.35**	**613.55**	**113.12**

119 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 periods being into the spring months, from February to April. The top three wettest recorded months in descending order are October, August and November.

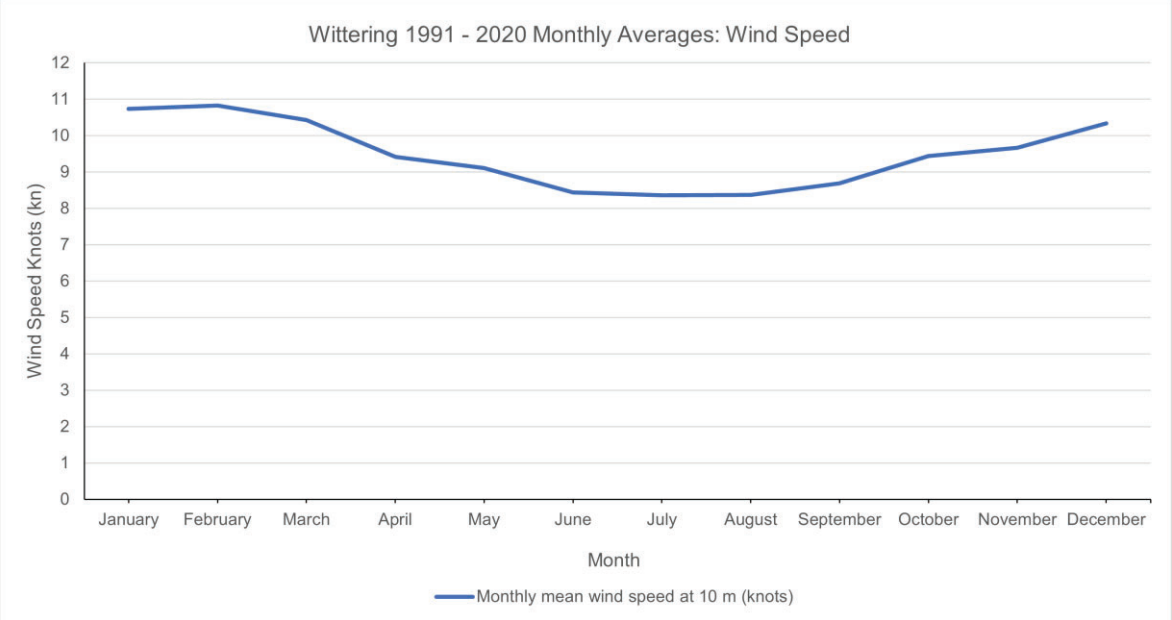


Figure 5.4: Monthly mean wind speeds, 1991 – 2020, Wittering

Table 5.8: Monthly mean wind speeds, 1991 – 2020, Wittering

Month	Monthly mean wind speed at 10m (knots)
January	10.73
February	10.83
March	10.43
April	9.42
May	9.11
June	8.44
July	8.36
August	8.37
September	8.69
October	9.44
November	9.67
December	10.34
Annual	**9.48**

120 The climatic baseline (1992 – 2020) data for Wittering via the Met Office shows that annual average wind speeds at 10 m are 9.48 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.

121 The latest future climate projections for the UK[53] (UKCP18) are based on global climate models. Predictions are based upon different emissions scenarios determined by the

[53] https://ukclimateprojections-ui.metoffice.gov.uk

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/m^2) 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.

122 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.

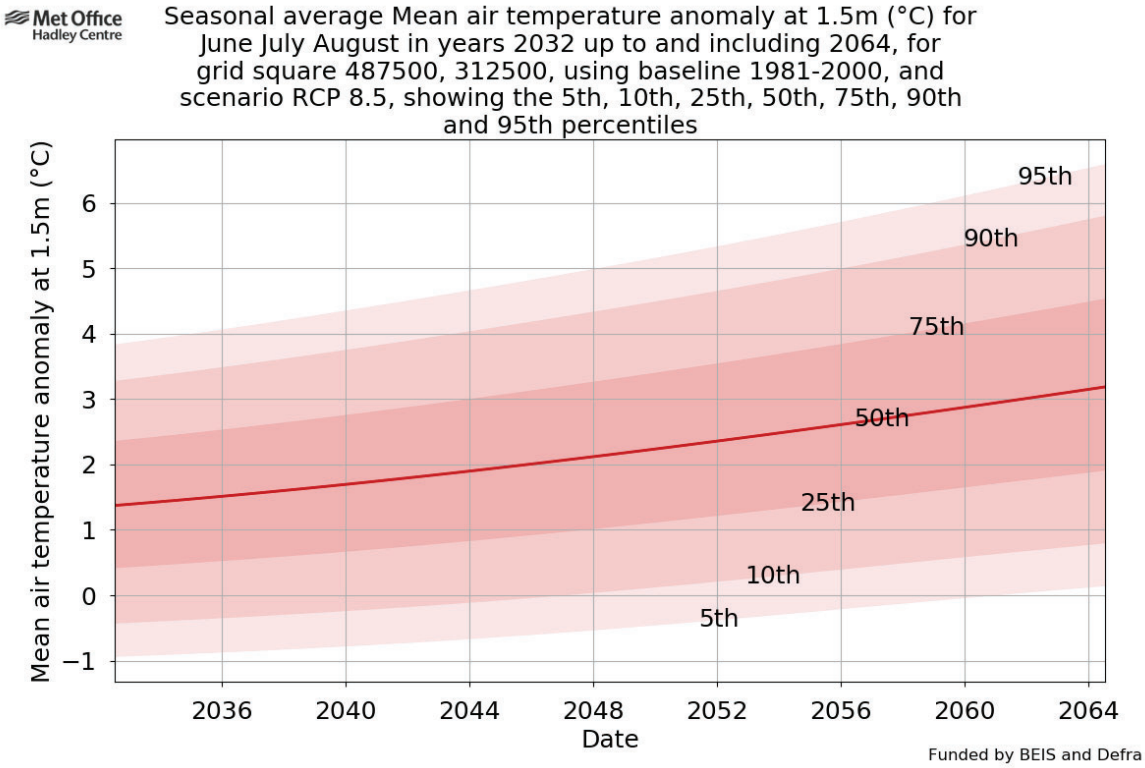


Figure 5.5: Summer months mean temperature anomaly

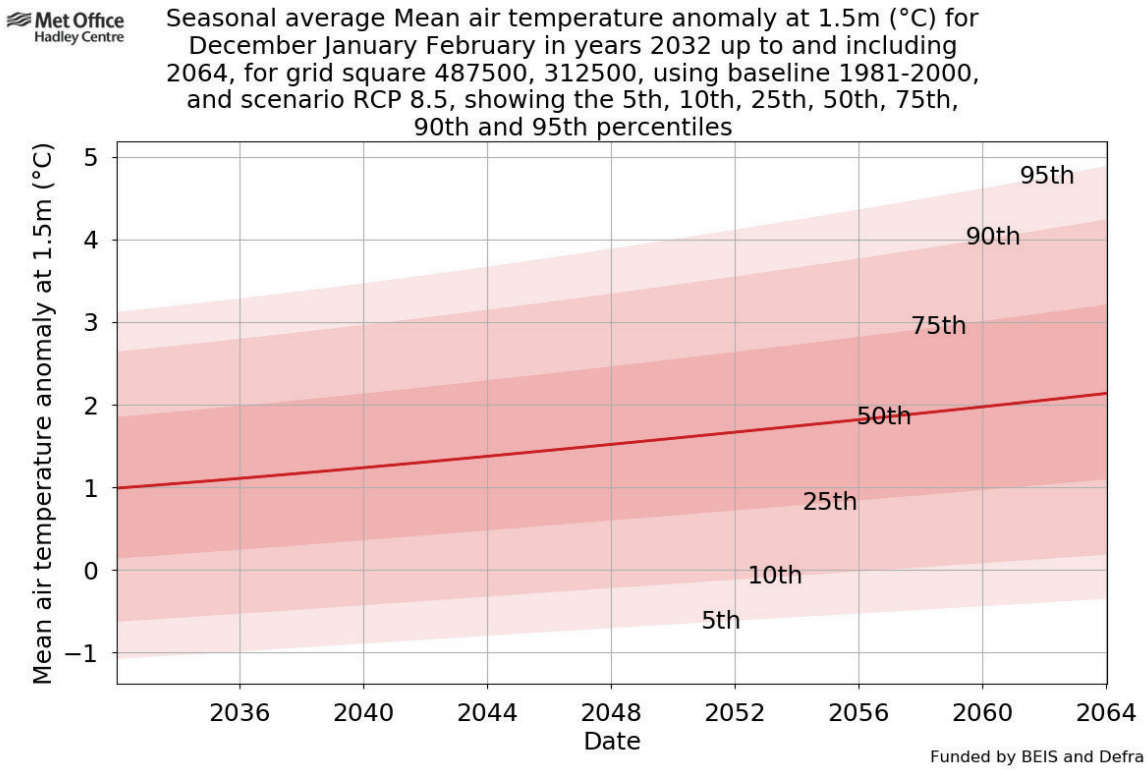


Figure 5.6: Winter months mean temperature anomaly

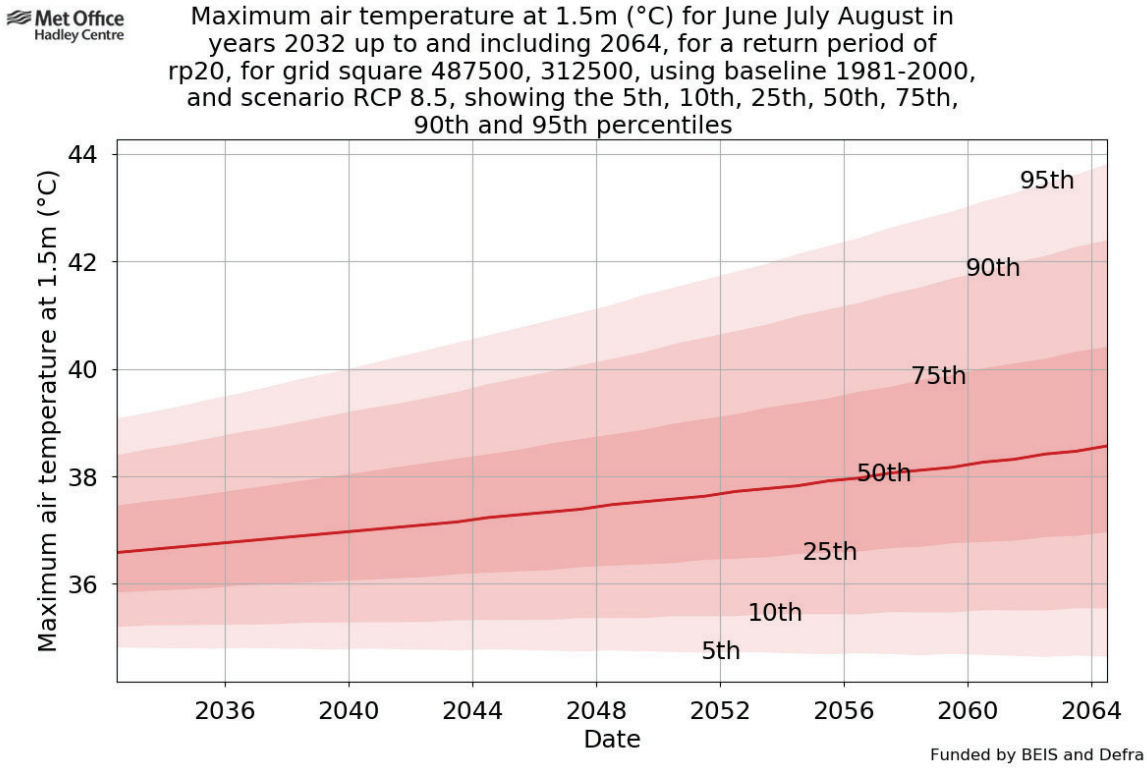


Figure 5.7: Maximum air temperature summer months

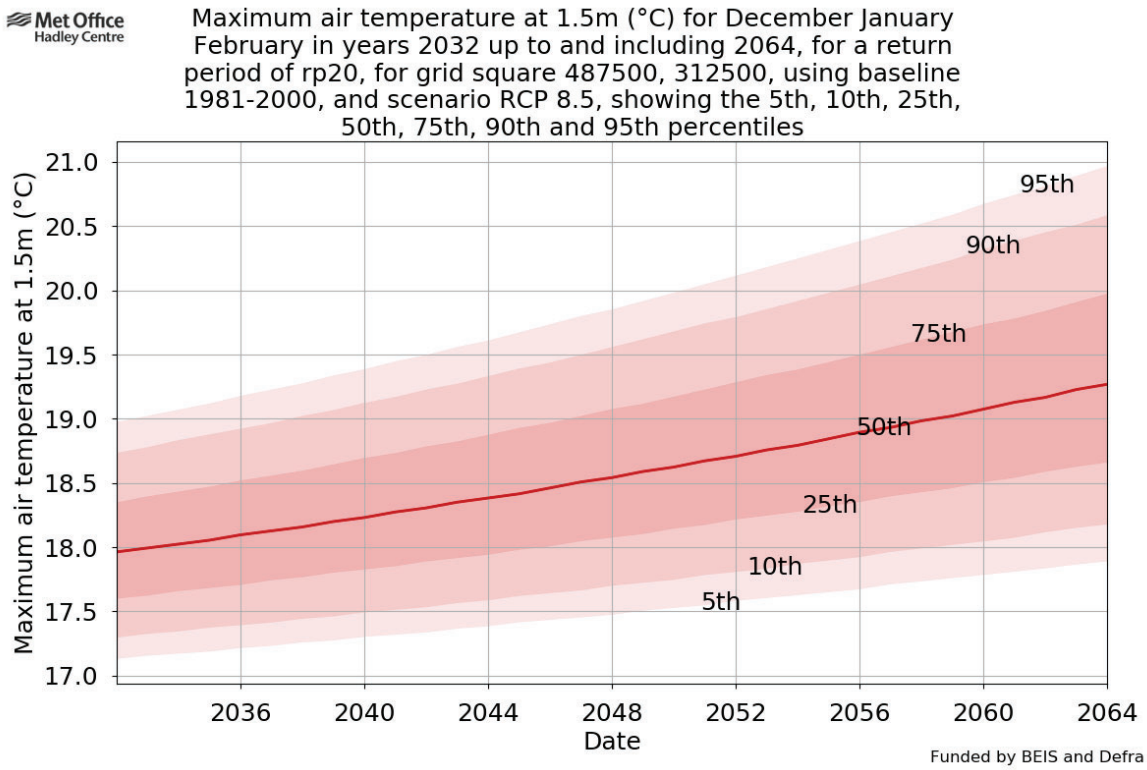


Figure 5.8: Maximum air temperature winter months

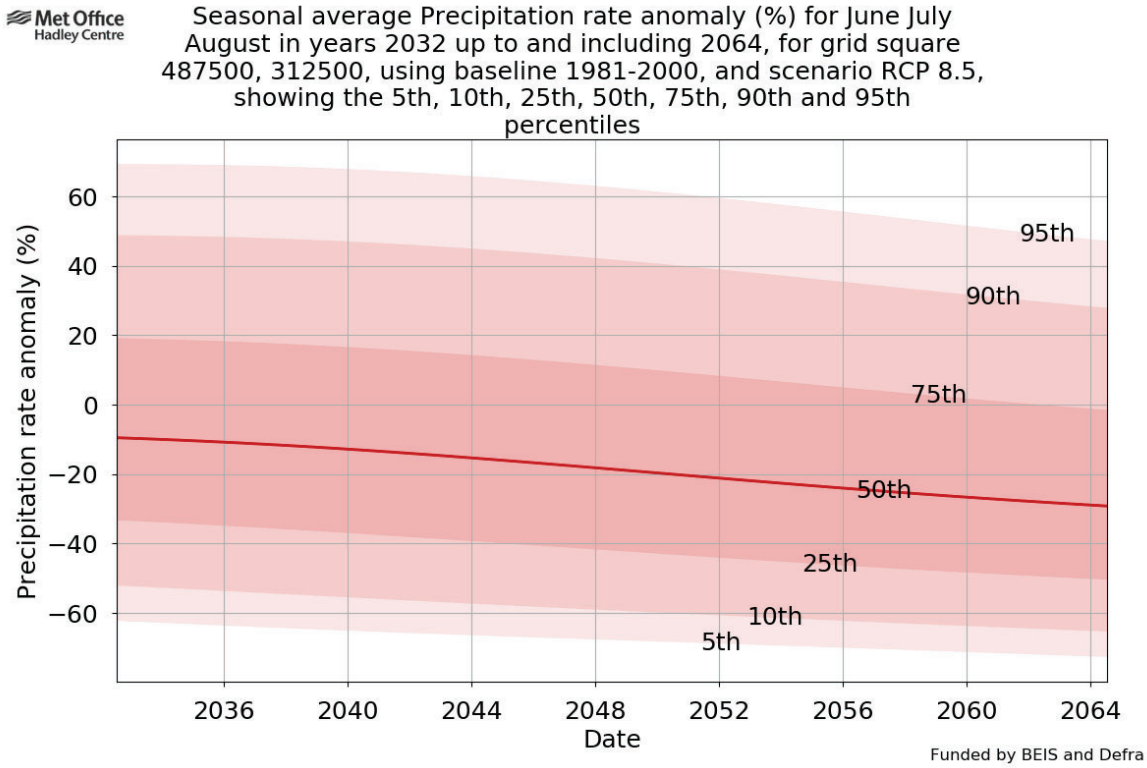


Figure 5.9: Summer months average precipitation anomaly

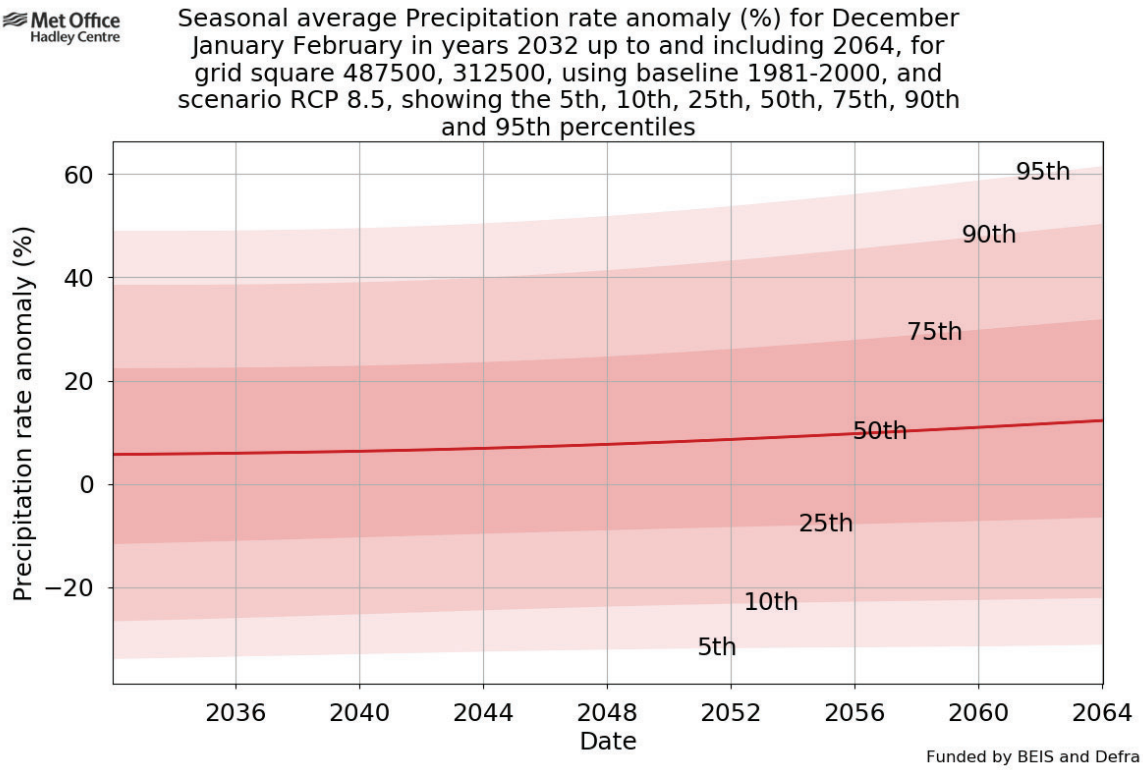


Figure 5.10: Winter months average precipitation anomaly

123 Based upon Figure 5.5 – Figure 5.10 using IEMAs recommended scenario (RCP 8.5), it shows that temperatures will increase in both the winter and summer months, however the predicted increases in temperature are more dramatic in the summer months. The figures also show that precipitation will increase in winter months but decrease in summer months.

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

5.6 Site Resilience to Climate Change

125 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.

126 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)
- Environmental receptors (e.g. habitats and species).

127 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.
- The significance of the effect, which takes into account both the identified sensitivity of the receptor and the magnitude of the impact.

128 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." The susceptibility and vulnerability of the receptor is classified using the criteria in Table 5.9 and Table 5.10. Receptor sensitivity results is classified using the criteria in Table 5.11.

Table 5.9: 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 5.10: 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 5.11: Receptor sensitivity results

Receptor	Sensitivity
Building and infrastructure	Moderate
Human health	Moderate
Environmental	Moderate

129 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.

130 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 specific approach to the assessment of likelihood and magnitude of climatic events.

131 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 5.12: IEMA likelihood criteria

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 is used as the example lifetime in IEMA guidance. The project duration is anticipated to be 39 years.	

Table 5.13: IEMA consequence of impact criteria

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.

132 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 5.13 and Table 5.14.

Table 5.14: 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 5.15: 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	Minor adverse	Minor
Precipitation	Medium	Minor adverse	Minor
Extreme Weather	Medium	Minor adverse	Minor

133 The most notable risk associated with maximum temperature increases are the risk of heat exhaustion or heat stroke. 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. 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.

134 Increased temperatures may also create unstable environments for local flora and fauna currently present within the vicinity of the site. This could lead to migration and loss of species but also increases the risks of new pathogens impacting certain plants.

135 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. Flooding can occur which could inhibit vehicular movement around the site premises depending on the severity, reducing extraction capabilities 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.

136 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 wetting down for dust suppression or washing may be impeded temporarily. Droughts will also lead to increased dust generation and propagation thus potentially negatively affecting air quality. The drying of soil and sand on site from drought could lead to the ground instability and slope failures.

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

138 Climate change effects may adversely impact the plans for site restoration and replanting. Drought conditions may hinder the re-establishment of natural plant and the proposed wetlands.

Table 5.16: Significant assessment for climate resilience

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

139 The results from the significance assessment in Table 5.16 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 not likely, and 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.

5.7 Cumulative Effects

140 In terms of cumulative effects on carbon emissions, the projected emissions from the proposed development can be considered in the context of the cement production industry's contribution to the UK's projected emissions overall. The proposed development will contribute to the group of industrial processes requiring the benefit of engineered removals to reach Net Zero at 2050.

141 As regards the cumulative effect of the proposed development on resilience to climate change in the local area, the site restoration to landscaped areas with vegetation are anticipated to have a neutral effect on average temperature increases and rainfall intensity.

6 Conclusion and Summary

142 This Climate Change Assessment is of proposed extensions at an existing quarry, known as Grange Top Quarry, at Ketton Cement Works in Rutland.

143 The limestone and clay from the quarry are used to supply raw material to the cement Works. Planning permission is being sought to consolidate and extend mineral extraction into two new areas known as the NW Land and Field 14 to extend the life of the quarry and therefore the adjoining Works to about 2060. A proposed new access road linking the Works to the A606 road forms part of the proposed development.

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

145 The results of the carbon assessment, defining the baseline and calculating future GHG emissions, assessing the 'reasonable worst case' found that the impact of future operations on GHG emissions at the quarry and works would have a major adverse impact and significant effect, due to emissions from the Works.

146 Mitigation measures are being considered in order to manage the future emissions and reduce the overall Greenhouse Gas emissions of the site including the works, to be in line with the UK's and Heidelberg Materials trajectory towards Net Zero by 2050. However, many of those solutions sit outside the planning system whilst others e.g. installation of CCS are not in a sufficiently advanced state to be presented as part of this planning application, despite being a significant part of Heidelberg Materials longer term plans.

147 Heidelberg Materials are leading the way in mitigating climate change emissions from cement manufacture in the UK, having begun installation of Carbon Capture and Storage at their Padeswood plant.

148 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 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.

149 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 development is Not Significant.

Appendix A: GHG Protocol and Scopes of Emissions

The GHG Protocol is published by the Greenhouse Gas Protocol Initiative, a multi-stakeholder partnership of businesses, non-governmental organizations governments, and others convened by the World Resources Institute and the World Business Council for Sustainable Development. Launched in 1998, the Initiative's mission is to develop internationally accepted greenhouse gas accounting and reporting standards for business and to promote their broad adoption. The GHG Protocol classifies GHG emissions using three categories, labelled "Scope 1", "Scope 2" and "Scope 3" and these are explained further below. The scope descriptions of the emissions are potentially confusing. From a planning perspective, the emissions which are not inside the redline boundary could be defined as 'not Scope 1' direct emissions nor Scope 2 indirect electricity emissions and therefore Scope 3 emissions, because they are neither Scope 1 or 2, but are contingent on the planning permission, and will be a downstream consequence of it being granted, in the way that is analogous to the Finch and West Cumbria cases. The Works however is under the same control as the Site meaning that it does not fall within Scope 3.

Scope 1 Emissions

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 HM. The values presented are in litres of fuel (gas oil, also known as diesel).

Scope 2 Emissions

Indirect Greenhouse Gas Emissions (Scope 2 emissions) are those associated with electricity used and consumed onsite, not owned or controlled by HM. 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.

Scope 3 Emissions

Scope 3 emissions are those related to the consequence of the activities of the proposed development but are not directly owned or controlled by HM. This includes upstream and downstream emissions, such as production of purchased goods and services, transportation and distribution and energy-related activities not owned or controlled by the company. Following the Supreme Court's ruling R (Finch) v Surrey County Council, DS have advised that Scope 3 emissions should be assessed, as best as possible.

The GHG Protocol Scope 3 Standard for *corporate* as opposed to *project* reporting categorises Scope 3 emissions into 15 categories, distinguishing between upstream and downstream categories. Nevertheless, the categories can usefully be considered for context and are as set out below. Companies are not obliged to report on all categories, and HM report six categories.

Upstream Categories

These categories are:

Category 1 (Purchased goods and services)

Category 2 (Capital Goods)

Category 3 (Fuel- and energy-related activities)

Category 4 (Upstream Transportation and Distribution) – reported by HM

Category 5 (Waste Generated in Operations) – reported by HM

Category 6 (Employee Commuting) – reported by HM

Category 7 (Business Travel) – reported by HM

Category 8 (Upstream Leased Assets)

Downstream Categories

The downstream categories are as follows:

Category 9 (Downstream Transportation and Distribution) – reported by HM

Category 10 (Processing of Sold Products)

Category 11 (Use of Sold Products)

Category 12 (End-of-life Treatment of Sold Products)

Category 13 (Downstream Leased Assets)

Category 14 (Franchises)

Category 15 (Investments)

Given the above, consideration was given to Scope 3 emissions for the proposed development, and none have been carried forward into the quantitative assessment, either because they do not meet the legal causation or capability tests, or because they do not meet the 1% materiality threshold.

Appendix B: Legislation and Context

B1. International Legislation

United Nations Framework Convention on Climate Change (UNFCCC)

The United Nations Framework Convention on Climate Change (UNFCCC)54, 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 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.

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.

The Paris Agreement (COP21)

The Paris Agreement[55] 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[56], 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.

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.

EU and UK Emissions Trading Schemes

The UK started an emissions trading scheme before the EU. The EU and UK Emissions Trading Schemes are 'cap and trade' schemes designed to reduce Greenhouse Gas emissions across industrial sectors, including the cement industry. The basis of the scheme is that each operator of a significantly emitting process is allocated a right to emit an allowance of CO_2 each year for free. At the end of each year, it must surrender the appropriate allowance to the regulator, buying in more allowances, or selling excess as necessary in a regulated financial market. An operation can generate surplus allowances by investing in decarbonisation and theoretically generate revenue from selling the surplus allowances. The main flaws of the scheme are that allowances have been over-allocated and are therefore of too low a value to drive decarbonisation investment, and that it adds cost to domestic products which are not added to products from non-participating countries, undermining the pricing effect of the scheme.

[54] United Nations Framework Convention on Climate Change, 9th May 1992
[55] United Nations Framework Convention on Climate Change, Decision1/CP.21 'The Paris Agreement' 26th January 2016
[56] United Nations Framework Convention on Climate Change Kyoto Protocol, 11th December 1997

The EU ETS has been related to UNFCCC/Kyoto Protocol mechanisms for emissions reductions.

Ketton Works was regulated for its emissions under the EU ETS until Brexit, after which time it came under the current iteration of UK ETS. Its current permit is UK-E-IN-11396.

European Climate Law

Launched in 2019, the European Green Deal sets out a plan to transform Europe's economy, energy, transport and industries for a more sustainable future. The Deal aims to cut emissions by at least 50% by 2030, rising towards 55% to be climate-neutral by 2050.

The European Climate Law, entered into force July 2021, made the 2050 climate neutrality commitment set out in the European Green Deal legally binding and set the intermediate target of reducing net GHG emissions by at least 55% by 2030, compared to 1990 levels. The Law also includes a process for setting a 2040 climate target. As of November 2025, Member States agreed on a general approach to a legally binding 2040 target of 90% reduction in net GHG emissions, with a domestic target of 85% and up to 5% of international carbon credits. The Climate Law also includes a commitment to negative emissions after 2050 and a system for Member States to monitor progress and take further action if needed. Member States have developed national long-term strategies on how they plan to achieve the GHG emission reductions needed to meet the commitments of the Paris Agreement and the EU climate neutrality objectives.

Cement Europe's Net Zero Roadmap

Cement Europe (formally CEMBUREAU) is the representative organisation of the cement industry in Europe. Cement Europe's Net Zero Roadmap sets the path to carbon-neutral cement and concrete sector by 2050. The roadmap aims for a 37% reduction in CO_2 emissions from cement production and 50% across the full value chain by 2030. By 2040, these reach 78% and 93% respectively.

B2. National Legislation (UK and England)

The Climate Change Act (2008)

It is through the Climate Change Act 2008 that the UK seeks to comply with its obligations under the Paris Agreement. The Climate Change Act 2008[57] sets out the UK governments 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, parliament pledged to improve this by setting a more ambitious target of becoming carbon neutral ('net zero') by 2050, under the Climate Change Act 2008 (2050 Target Amendment) Order 2019. The amendment in this Order has the effect that the minimum percentage by which the net UK carbon account for the year 2050 must be lower than the 1990 baseline is increased from 80% to 100%.

[57] Parliament of the United Kingdom. (2008), 'Climate Change Act 2008', c.27. King's Printer of Acts of Parliament

Legal commentary[58] on the Climate Change Act queries the ability of the courts to force action on the government, where the action necessitates the allocation of public resources, and at what time it would be appropriate to sue the government, and what the remedy might be.

Strategies implemented since the Climate Change Act 2008, cover a wide range of sectors including the cement and lime sector.

The Climate Change Committee was established under the Climate Change Act 2008 and advises the UK on reducing emissions and adapting to the impacts of climate change. Figure B 1 shows how the UK's emissions have halved from c.850 to c.400 $MtCO_2e$ in the 35 years since 1990. A steeper fall will be required to achieve Net Zero in the next 25 years.

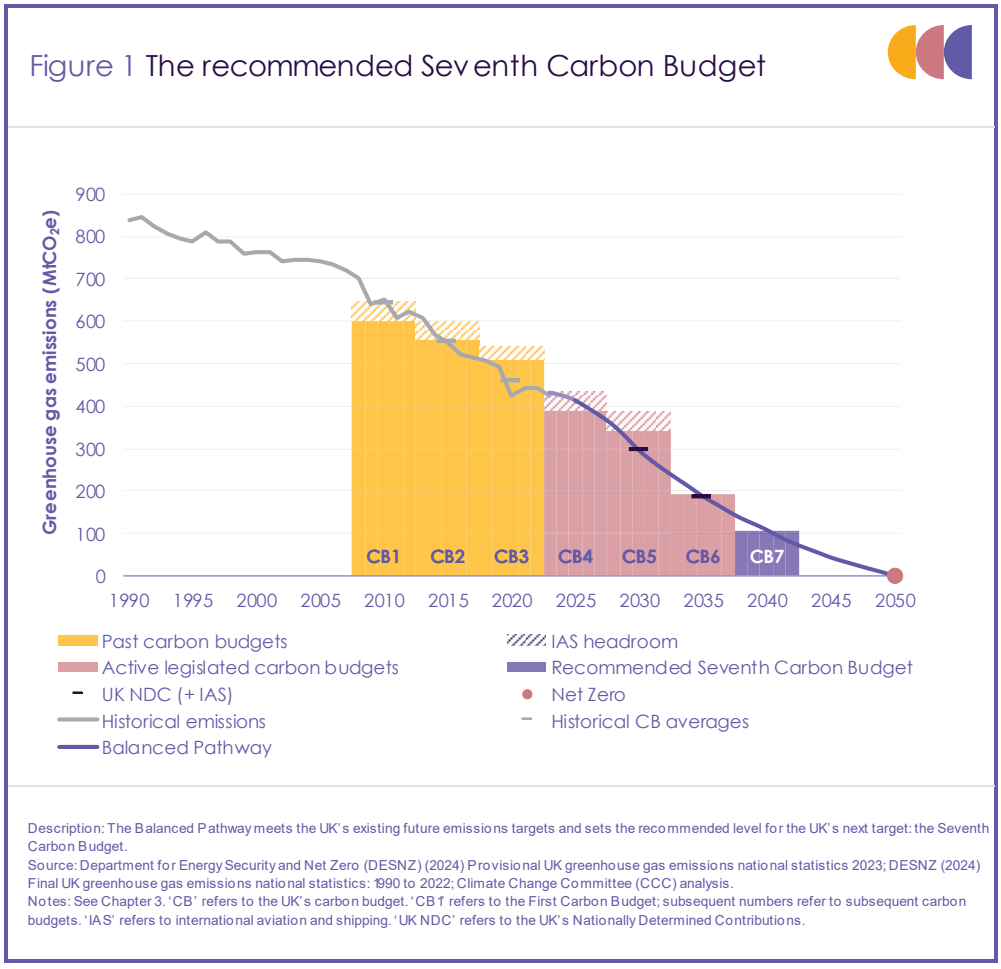


Figure B 1: Figure 1 reproduced from the 7th Carbon Budget report of the UK Climate Change Committee

Planning and Compulsory Purchase Act (2004)

[58] Colin T Reid, 'A New Sort of Duty? The Significance of "Outcome" Duties in the Climate Change and Child Poverty Acts (2012) 4 Public Law 749, 751-2, 757

Section 19(1A) of the Planning and Compulsory Purchase Act 2004[59] places a legal duty on local planning authorities to include:

> "… *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*."

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)

The amended 2014 EU 'EIA' directive 2014/52/EU[60] was transposed into UK law by The Town and Country Planning (Environmental Impact Assessment) Regulations 2017[61] and came into force in May 2017 ('EIA Regulations').

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.

Mineral Planning Case Law - R (oao Finch & Others) v Surrey County Council & Others

There is a summary of the effect of the Finch case in the later case of R (Caffyn) v Shropshire Council [2025] EWHC 1497 (Admin).

> "***Finch***
> *17. **Finch** was decided on 20 June 2024, a month after the target decision in this case. In **Finch**, the Supreme Court decided that the grant of planning permission for an onshore oil-extraction project was unlawful (§174). That was because the "likely indirect effects" of the project had not been assessed within the EIA. Those effects were the climate effects of the greenhouse gas releases from the combustion of the processed oil as fuel. The EIA "process" duty (§15), with its public and participatory purposes (§§3, 18, 63), required the climate impacts of the greenhouse gas releases to be included within the planning authority's decision-making. The planning authority had unlawfully confined its consideration to releases directly from within the site boundary (§101). **Finch** endorsed **Squire**, as a working illustration of downstream likely indirect effects (§161). Features of the **Finch** case included these. First, that it was inevitable that the extracted oil would be processed and burned as fuel (§§7, 45, 123), meaning no indeterminacy regarding future use (§§121-122). Secondly, that the greenhouse gases, to be released from the inevitable combustion of the processed oil, could reliably be quantified (§§7, 81, 123). Thirdly, that the environmental harm was not locationally contingent, and would be the same wherever in the world the inevitable combustion took place (§§103, 114).*
> ***Causation***

[59] Parliament of the United Kingdom. (2004), 'Planning and Compulsory Purchase Act 2004', c.5. King's Printer of Acts of Parliament
[60] European Union. (2014), 'Amending Directive 2011/92/EU on the assessment of the effects of certain public and private projections on the environment', Directive 2014/52/EU
[61] UK Statutory Instruments. (2017), 'The Town and Country Planning (Environmental Impact Assessment) Regulations 2017', No.571. King's Printer of Acts of Parliament

*18. The Supreme Court emphasised the importance of identifying applicable "criteria" as a matter of "law" (**Finch** §§54-56). One criterion was causation. It was held that the "effects of a project" raised "a question of causation" (§65); that "indirect effects" has a "wide causal reach" (§83); that the "indirect effects" have to be "likely" (§§72-78) as "effects which evidence shows are likely to occur" (§167). The test is causation. There is no test of "sufficient causal connection" (§§59-60, 132); no test of being "part of the proposed development" (§§36(a), 129); and no test of whether effects are too "remote" (§129). Processing did not break the chain of causation (**Finch** §§126, 129). The strongest test of causation is met where the project is "both a necessary and sufficient condition" for the occurrence of the effects (§69). That test was met in **Finch** (§79). It was left open (§§73, 79) whether it would suffice to meet a less stringent test of proximate cause in the ordinary course of events (§§70-71). There was room for evaluative judgment in asking whether "indirect effects" are "likely" (§78).*

Capability of Meaningful Assessment

*19. A second criterion was that effects must be "capable of meaningful assessment" (**Finch** §167). There must be a sufficiency of evidence, on which to base a determination that a "potential effect" is "likely" (§§74-75); on which a reasoned conclusion could properly be based (§§76-77); to identify the likely significant effects and the measures that can be taken to mitigate them (§§108-109). The "potential effect" must not be a matter of "speculation or conjecture" (§74). It must not remain "elusive, contingent and speculative" (§§167-168), for "conjecture and speculation have no place in the EIA process" (§77). So, it might be "impossible to assess … the likely quantity of … emissions" (§135). There might be "insufficient information available on which to make a reasonable assessment of the relevant impacts" (§138). There may be an indeterminacy regarding future use (§§121-122). A future use might be "so conjectural that no realistic estimate could be made of … emissions arising from such use" (§122). Or it may be necessary "to know where the emissions will occur to assess their environmental impact" (§114). There was room for an evaluative judgment in asking whether "indirect effects" are "capable of assessment" (§78).*
Lpa's Evaluative Judgment
*20. In relation both to causation (whether an effect is likely) and capability of meaningful assessment, **Finch** emphasised the evaluative judgment belonging to the LPA as primary decision-maker. Lord Leggatt said this (**Finch** §78):*
There is here an area of evaluative judgment involved in determining the scope of an EIA. Judging whether a possible effect of a project is likely and capable of assessment may, depending on the circumstances, be a matter on which different decision-makers, each acting rationally, may take different views."

In R (Friends of the Earth) v Secretary of State for Levelling Up, Housing and Communities [2025] Env. L.R. 14 Finch was applied to coal mining.

The dispute in *Finch* was whether or not the effects to be assessed for fossil fuel extraction included the 'downstream' of subsequent effects when the fuel was used. The case decides that those effects should be assessed as part of the environmental assessment. This is what the Report does. This Report does not consider how the assessed effects either should be or are integrated into the development management decision. Rather, this Report provides an assessment to consultees, the public and the decision maker. It is for others to address

the policy context and the planning judgements which are to be made on the totality of the factual and policy material.

However, the legal judgments have been taken into consideration in this assessment.

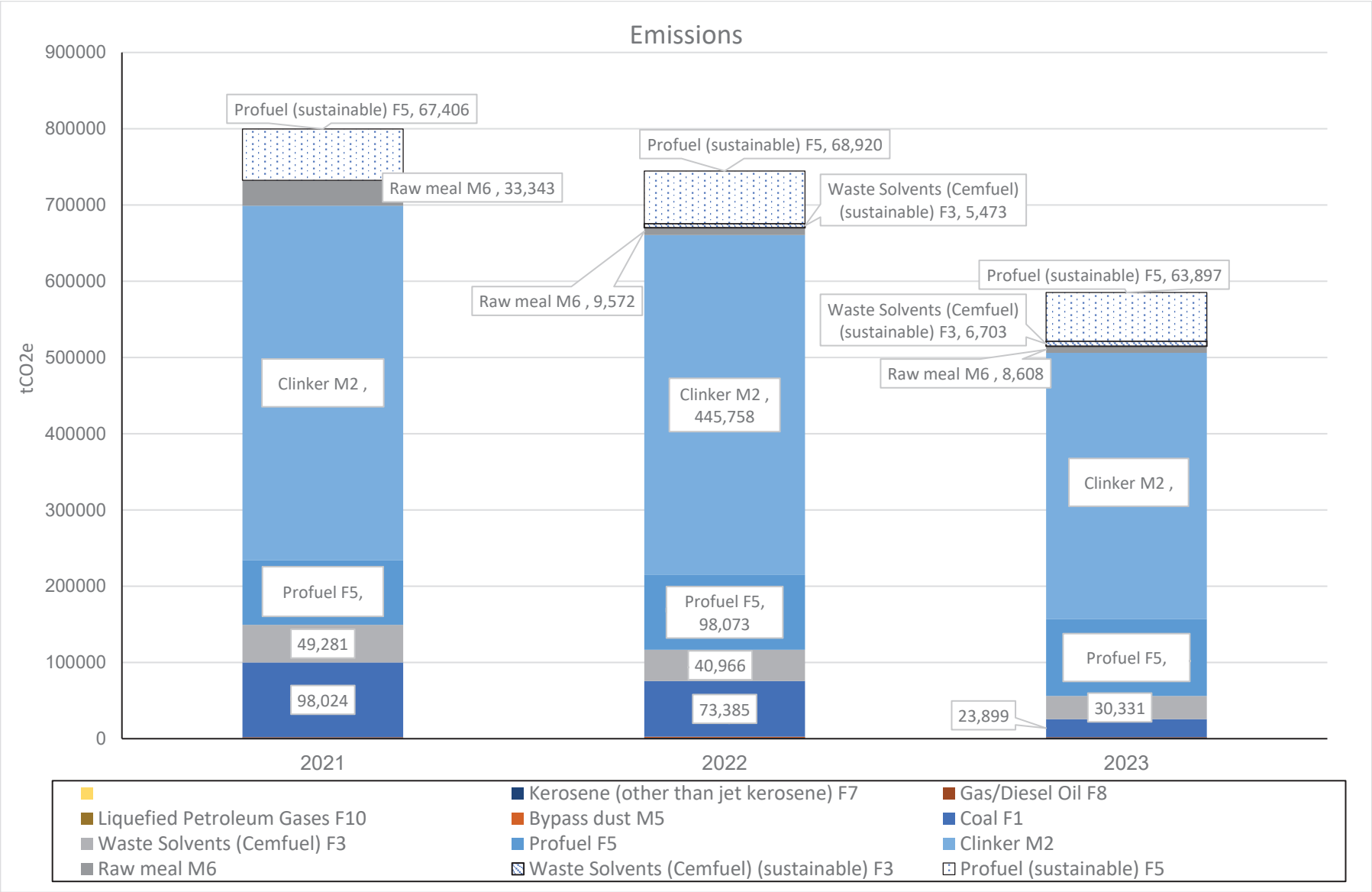
Appendix C: GHG Emissions Data Tables

C1. Works emissions from UKETS Reports

Source Stream		Emission Sources	2021 Reportable emissions	2021 Sustainable biomass	2022 Reportable emissions	2022 Sustainable biomass	2023 Reportable emissions	2023 Sustainable biomass
Coal	F1	S2	98,024	0	73,385	0	23,899	0
Petroleum Coke	F2	S2	0	0	0	0	0	0
Waste Solvents (Cemfuel)	F3	S2	49,281	0	40,966	5,473	30,331	6,703
Waste Solvents (Cemfuel) (sustainable)	F3				5,473		6,703	
Scrap Tyres	F4	S2	0	0	0	0	0	0
Profuel	F5	S2	85,164	67,406	98,073	68,920	100,712	63,897
Profuel (sustainable)	F5	S2	67,406		68,920		63,897	
MBM (Meat and bone meal)	F6	S2	0	0	0	0	0	0
Kerosene (other than jet kerosene)	F7	S3,S2	1,007	0	1,305	0	1,183	0
Gas/Diesel Oil	F8	S4,S2	223	0	61	0	114	0
Processed Fuel Oil	F9	S2	0	0	0	0	0	0
Liquefied Petroleum Gases	F10	S5,S2	41	0	41	0	41	0
solid waste fuel	F11	S2	0	0	0	0	0	0
Waste Oils	F12	S2	0	0	0	0	0	0
Bioliquid	F13	S6,S2	0	0	0	0	0	0
Biofuel	F14	S7,S2	0	0	0	0	0	0
Kerosene Blended Fuel	F15	S8					0	0
Cement	M1							
Clinker	M2	S2	464,547	0	445,758	0	349,168	0

			2021		2022		2023	
Source Stream		**Emission Sources**	**Reportable emissions**	**Sustainable biomass**	**Reportable emissions**	**Sustainable biomass**	**Reportable emissions**	**Sustainable biomass**
Gypsum (natural and alternative)	M3							
Limestone	M4							
Bypass dust	M5	S2	663	0	984	0	537	0
Raw meal	M6	S2	33,343	0	9,572	0	8,608	0
PFA or GGBS additions to Cement	M7							
Ferrous Sulfate	M8							
Alternative raw materials	M9							
Lime for HCl reduction	M10							
Total			732294	67,406	670,145	74,393	514,594	70,600

	2021	2022	2023
Total Emissions – fossil & non-fossil (tCO2)	799,700	744,538	585,195
% Material Emissions	62	61	61
% Fuel Emissions	38	39	39


Emissions
tCO2e
900000
800000
700000
600000
500000
400000
300000
200000
100000
0
2021
2022
2023
Profuel (sustainable) F5, 67,406
Raw meal M6 , 33,343
Clinker M2 ,
Profuel F5,
49,281
98,024
Profuel (sustainable) F5, 68,920
Waste Solvents (Cemfuel) (sustainable) F3, 5,473
Raw meal M6 , 9,572
Clinker M2 , 445,758
Profuel F5, 98,073
40,966
73,385
Profuel (sustainable) F5, 63,897
Waste Solvents (Cemfuel) (sustainable) F3, 6,703
Raw meal M6 , 8,608
Clinker M2 ,
Profuel F5,
30,331
23,899
Kerosene (other than jet kerosene) F7
Gas/Diesel Oil F8
Liquefied Petroleum Gases F10
Bypass dust M5
Coal F1
Waste Solvents (Cemfuel) F3
Profuel F5
Clinker M2
Raw meal M6
Waste Solvents (Cemfuel) (sustainable) F3
Profuel (sustainable) F5

C2. MPA ANNUAL CEMENTITIOUS STATISTICS - GREAT BRITAIN TO 2014, UK FROM 2015

Abridged Data from MPA								*Calculations by DS*			
(Figures in Thousand tonnes)	**MPA Cement Production**	**MPA Cement Sales from GB production**	**MPA Cement Imports**	**Domestic Cement Sales**	**Estimated Imports by others**	**All Imports**	**Cement Sales (Includes all imports)**	***tCO2/year from MPA Cement Production***	***tCO2/ year from All Imports at 870kg/tonne***	***Total tCO2/y from Cement Sales***	***Import CO2 as a % of total***
2001	11,090	10,656	1,182	11,838	360	1,542	12,198				
2002	11,089	10,762	966	11,728	452	1,418	12,180				
2003	11,215	11,072	576	11,648	646	1,222	12,294				
2004	11,405	11,074	609	11,683	825	1,434	12,508				
2005	11,216	11,004	306	11,310	971	1,277	12,281				
2006	11,469	11,222	122	11,344	1,088	1,210	12,433				
2007	11,887	11,650	255	11,905	1,121	1,376	13,026				
2008	10,073	9,861	283	10,144	1,084	1,367	11,228				
2009	7,623	7,474	99	7,573	1,085	1,184	8,658				
2010	7,883	7,767	61	7,828	1,153	1,214	8,980				
2011	8,529	8,318	86	8,403	1,173	1,259	9,576				
2012	7,952	7,728	61	7,789	1,122	1,183	8,910				
2013	8,203	8,204	117	8,321	1,322	1,439	9,643				
2014	8,958	8,751	227	8,979	1,590	1,817	10,568				
2015	9,235	9,526	635	10,161	1,425	2,060	11,585				

Abridged Data from MPA								*Calculations by DS*			
(Figures in Thousand tonnes)	**MPA Cement Production**	**MPA Cement Sales from GB production**	**MPA Cement Imports**	**Domestic Cement Sales**	**Estimated Imports by others**	**All Imports**	**Cement Sales (Includes all imports)**	***tCO2/year from MPA Cement Production***	***tCO2/ year from All Imports at 870kg/tonne***	***Total tCO2/y from Cement Sales***	***Import CO2 as a % of total***
2016	9,370	EXCLUDED	EXCLUDED	10,499	1,503	1,503	12,001				
2017	9,359	9,063	1,114	10,177	1,619	2,733	11,796				
2018	9,197	9,141	935	10,076	1,663	2,598	11,739				
2019	9,079	9,078	801	9,878	1,727	2,527	11,605				
2020	8,046	8,030	560	8,590	1,791	2,351	10,381	6,755,422	2,045,370	8,800,792	23%
2021	9,008	9,077	1,083	10,160	2,207	3,290	12,367	7,563,117	2,862,300	10,425,417	27%
2022	8,393	8,364	1,302	9,666	2,344	3,646	12,010	7,046,763	3,172,020	10,218,783	31%
2023	7,689	7,486	1,266	8,752	2,330	3,596	11,082	6,455,684	3,128,520	9,584,204	33%
2024	7,283	7,091	931	8,022	EXCLUDED	EXCLUDED	EXCLUDED				
						Averages 2021-2023		7,021,855	3,054,280	10,076,135	30%

Notes to table.

1. Where data is ‘EXCLUDED’ it is due to the CMA direction.
2. DS calculations for tCO2/year emissions from MPA Cement Production are estimated using the tonnage factored by the CEM I emission factor of 839.6 kgCO2e/tonne (taken MPA CEM I EPD, 2022-2027).
3. DS calculations for tCO2/year emissions from All Imports are estimated using the tonnage factored by the JRC emission factor of 870 kgCO2e/tonne.

APPENDIX 6 – HIGHWAYS

Non-Technical Summary

Heidelberg Materials UK has appointed Tetra Tech to prepare a Technical Note to review and respond to various consultation responses received for the extension of Grange Top Quarry in Ketton, Rutland. In summary, the proposals include an extension to the worked area and the proposed construction of a new roundabout on the A606 Stamford Road to access the site.

The following bullet points summarise the response and should be read in conjunction with the Transport Assessment prepared in support of the planning application:

- References to the Appendices (Transport Assessment) have been considered and reviewed. The tracking drawing referred to in Appendix E is attached to this Note.
- The proposals will not generate any additional traffic arising from the Works though they will extend the life of the current traffic flows and will shift the traffic form the A6121 to the A606, as requested by RCC, to remove works traffic from Tinwell.
- The distribution of HGV traffic is based on existing dispatch data provided by Heidelberg Materials. The data shows that 5% of HGV would travel west on the A606 Stamford Road with the remaining travelling onto the strategic road network (i.e. the A1).
- The existing (and future) distribution of HGV's suggests that 5% of HGV's travel west through Empingham, this equates to approximately four two-HGV movements per hour. Given the overall number of movements to the west, the impact on the A606 through the village of Empingham is minimal. Given the lack of any sizable cement market between the site and Leicester, this split is unlikely to change, as there is no benefit to most hauliers from travelling through Empingham.
- The majority of HGV's travel to the east on the A606 to the A1. There is a modest increase in HGV vehicle movements to the east on the A606 Stamford Road; however, the impact is not considered to be severe. There is no increase in HGV movements using the A1 and consequently, National Highways have raised no objections.
- Rutland County Council's Highways Development Control team requested a Stage 1 Road Safety Audit of the proposed site access roundabout onto the A606. The appropriate road safety reports were undertaken in accordance with GG119 of the Design Manual for Roads and Bridges (DMRB). The Council's highways team subsequently confirmed that there are no further objections in terms of highway safety or amenity associated with the proposed site access.

1.0 Introduction

1.1 Tetra Tech is providing transport planning support in relation to the planning application on behalf of Heidelberg Materials UK (HMUK) who manage and operate the works at the Grange Top Quarry site in Ketton, Rutland.

1.2 A Transport Assessment (TA) dated November 2023 was prepared in support of the planning application.

1.3 This Technical Note has been prepared in relation to individual responses received to planning application 2024/0066/MIN. The planning application is for:

> *"Proposed extensions to Grange Top Quarry, for construction and use of a new access and site access road from the A606, a security gatehouse, bridleway bridge and associated works to*

facilitate the continued supply of minerals to Ketton Cement Works, the consolidation of existing mineral extraction permissions and a restoration scheme to recreate agricultural land and biodiversity enhancement works."

2.0 Purpose of this Technical Note

2.1 This note has been prepared in response to wider consultation feedback received as part of the planning application process. It should be noted that all outstanding concerns raised by Rutland County Council (RCC) in their capacity as the Local Highway Authority (LHA) have been resolved. The steps taken to satisfy the LHA have been detailed later in this Technical Note. Similarly, Highways England has also responded to the application consultation with a 'no objection' response.

2.2 Consequently, this note aims to address any remaining responses that have been received through the formal planning application consultation process. The responses are generally from individual residents from the surrounding area. Empingham Parish Council have also submitted a response.

2.3 The key points raised are summarised as follows:

- Inconsistencies in the numbering of Appendices included in the TA.
- Drawing showing the swept path analysis is missing.
- Clarification regarding the usage of the existing and proposed site accesses and the level of traffic forecast to travel through Empingham.
- Traffic impact arising from traffic travelling east.
- Volume of traffic generated during various phases of the proposed development.

3.0 Appendices

3.1 Comments were raised regarding numbering/lettering of some of the appendices included in the TA. To clarify the information that was included in the TA, the relevant information has been appended to this Technical Note. **Appendix A** of this Technical Note includes the proposed site access junction details. This includes the preliminary geometric design of the proposed roundabout on the A606 Stamford Road and the swept path analysis.

3.2 It is acknowledged that the TA text referred to traffic flow diagrams and trip generation in Appendix E in the TA. The TA text should have referenced the data as being in Appendix F instead.

4.0 Existing/proposed HGV movements

4.1 To clarify, the proposed extension and the new junction on the A606 Stamford Road will not generate any new HGV movements on the wider network; however, it is accepted that there will be a slight increase in HGV movements through Empingham. Similarly, the wider HGV origins/destinations will not change as these are derived from historical commercial dispatch data. The data obtained from HMUK confirms that approximately 5% of HGV's travel to/from the west via the A606 Stamford Road.

4.2 The new access will move Works traffic from the A6121 to the A606.

4.3 The TA has assessed a worst-case scenario by assuming all HGV movements would use the proposed junction on the A606 Stamford Road.

5.0 Traffic Impact – Empingham Village

5.1 As mentioned previously, the traffic generation and volume of HGV traffic proposed to be travelling to various destinations has been based on historical commercial data and will not change. However, the location of the proposed new access will result in an altered route choice and consequently

there is predicted to be a slight increase traffic through Empingham. The predicted increase in HGVs through Empingham is four HGV's per hour. Whilst this is an increase, the change is considered to be negligible. The HGV traffic patterns have been derived using commercial data and confirms that the majority of HGV would travel to/from locations via the strategic road network.

5.2 Given the proposed number of HGV vehicle movements through the village of Empingham, there is no requirement to restrict HGV traffic movements. The proposed number of HGV's travelling west through Empingham is nominal (four two-way HGV trips per hour). Given that there will be no change in the number of HGVs through Empingham, there will not be an adverse impact.

6.0 Traffic Impact – A606 East

6.1 Most of the HGV traffic is proposed to use the A606 Stamford Road to the east. Junction capacity assessments using Junctions 9 have been undertaken for the morning and evening peak hours at the proposed A606 Stamford Road/site access roundabout. The junction has been assessed in the '2030 Background', '2055 Background' and '2055 Background plus Proposed Development' traffic flow scenarios.

6.2 The assessment has considered an absolute worst-case scenario by assuming that all Works traffic would use the new access on the A606 Stamford Road. Furthermore, the assessment has considered a 2055 future year which is significantly in excess of what would normally be considered appropriate for a forecast year (usually five or ten years post submission of a planning application). The results show that the proposed junction operates with spare capacity in 2030 and 2055, inclusive of background traffic growth and with the addition of the proposed development traffic.

6.3 To reiterate once again, the proposals do not generate any new traffic movements on the wider network; however, it is noted that there is an increase in traffic on the A606 and through Empingham. The HGV's generated by the Works are already using the A1. Consequently, National Highways who are responsible for the strategic road network have raised no objections.

7.0 Traffic movements/phasing

7.1 For the avoidance of doubt HGVs would continue to use the existing accesses to the south of the works until the proposed roundabout and haul road is constructed.

8.0 Consultation with Rutland County Council (Highways)

8.1 As part of the consultation process, the LHA requested a Road Safety Audit to be undertaken of the proposed site access roundabout on the A606. Consequently, a Stage 1 Road Safety Audit was undertaken. In accordance with GG119 of DMRB, the Design Organisation prepared an Audit Response report including a Decisions Log. The reports were submitted to the LHA, and they were formally approved on the 12th of September 2025.

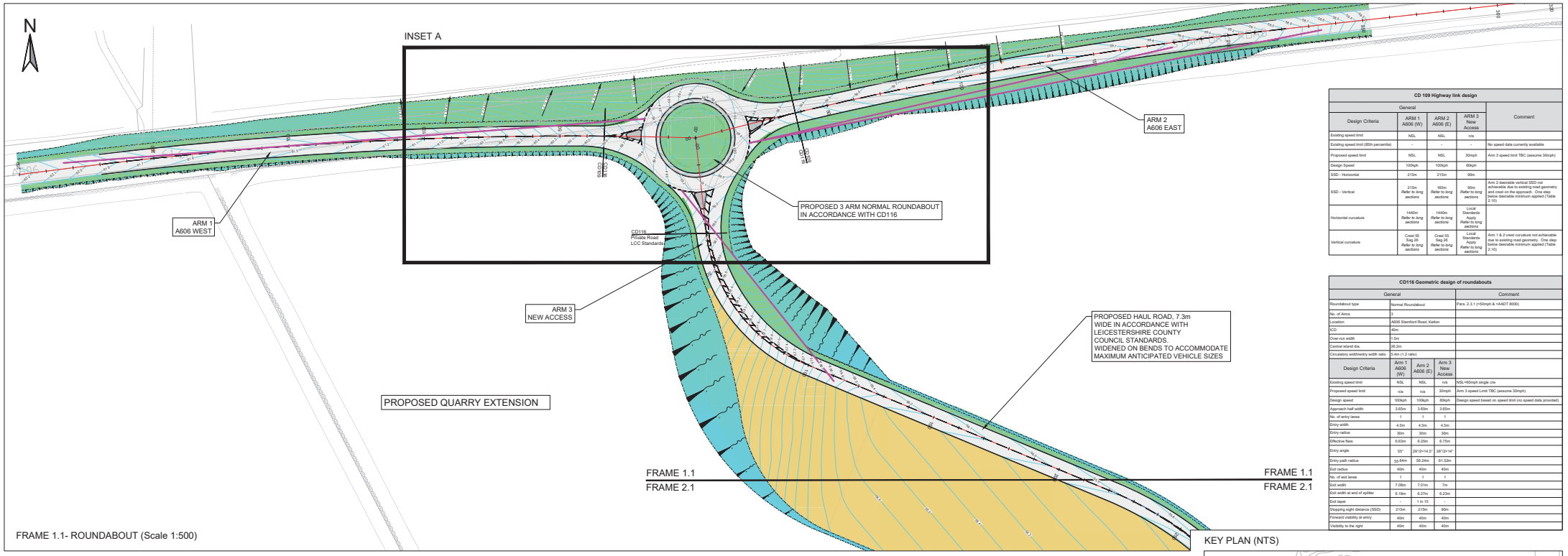
8.2 RCC highways development control has subsequently confirmed that they have no objections.

8.3 The Stage 1 Road Safety Audit and Audit Response has been included in **Appendix B.**

9.0 Conclusions

9.1 This Technical Note addresses the outstanding highways related queries raised by various individuals/organisations responding to planning application planning 2024/0066/MIN. Based on the findings of this Note it is considered that the proposed extension to Grange Top Quarry is in accordance with relevant policy and design guidance. It is therefore acceptable in transport terms and that it is respectfully recommended for approval by the appropriate planning authority.

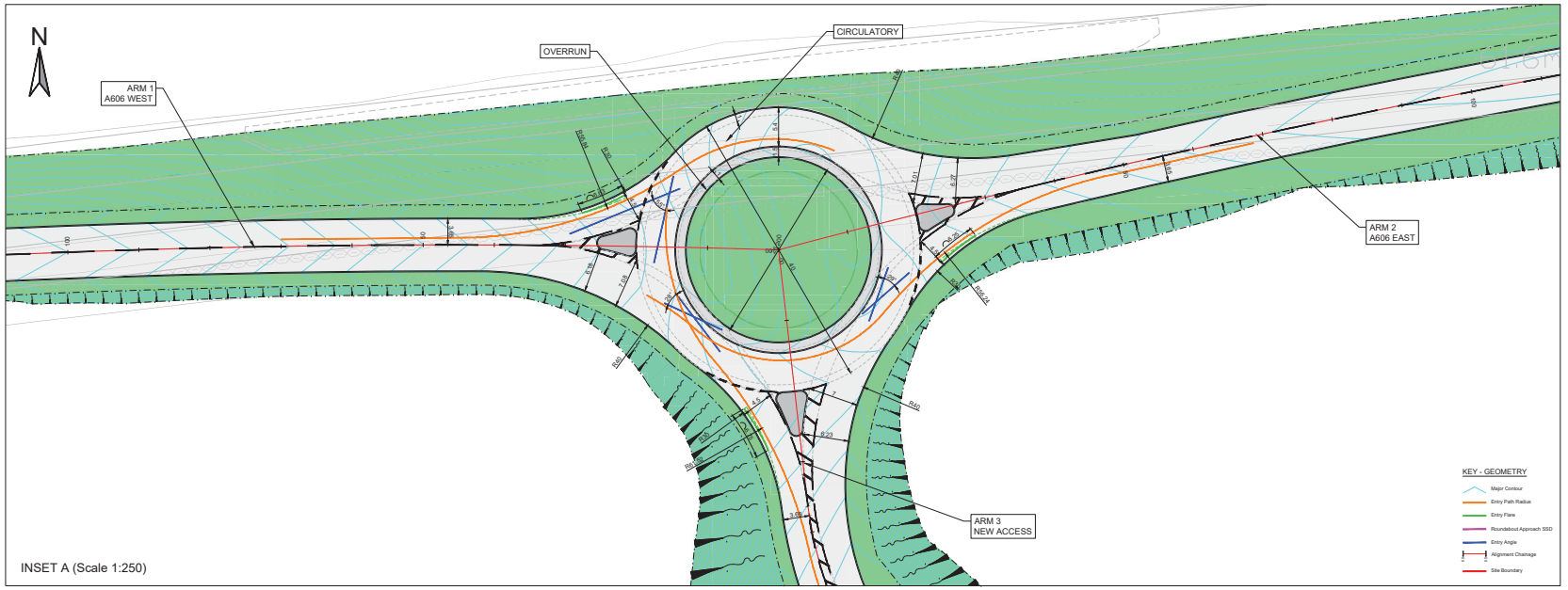
Appendix A – Proposed Roundabout Geometry and Swept Path Assessment



FRAME 1.1- ROUNDABOUT (Scale 1:500)

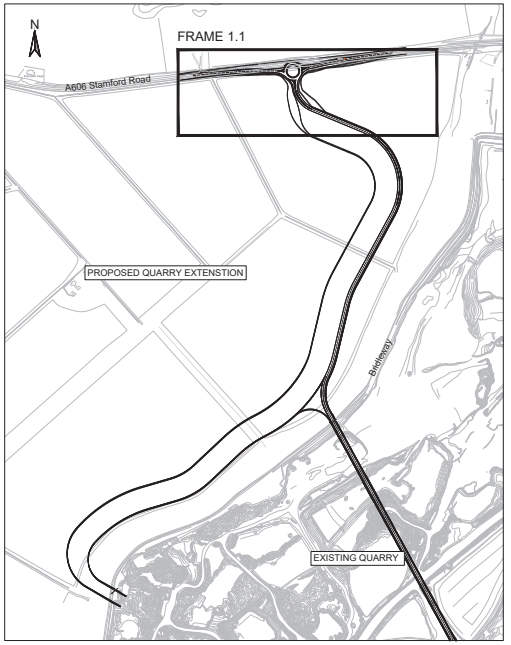
CD 109 Highway link design				
General				
Design Criteria	ARM 1 A606 (W)	ARM 2 A606 (E)	ARM 3 New Access	Comment
Existing speed limit	NSL	NSL	n/a	
Existing speed limit (85th percentile)	-	-	-	No speed data currently available
Proposed speed limit	NSL	NSL	30mph	Arm 3 speed limit TBC (assume 30mph)
Design Speed	100kph	100kph	60kph	
SSD - Horizontal	215m	215m	90m	
SSD - Vertical	215m *Refer to long sections*	160m *Refer to long sections*	90m *Refer to long sections*	Arm 2 desirable vertical SSD not achievable due to existing road geometry and crest on the approach. One step below desirable minimum applied (Table 2.10)
Horizontal curvature	1440m *Refer to long sections*	1440m *Refer to long sections*	Local Standards Apply *Refer to long sections*	
Vertical curvature	Crest SS Sag 26 *Refer to long sections*	Crest SS Sag 26 *Refer to long sections*	Local Standards Apply *Refer to long sections*	Arm 1 & 2 crest curvature not achievable due to existing road geometry. One step below desirable minimum applied (Table 2.10)

CD116 Geometric design of roundabouts				
General				Comment
Roundabout type	Normal Roundabout			Para. 2.3.1 (<50mph & >AADT 8000)
No. of Arms	3			
Location	A606 Stamford Road, Ketton			
ICD	40m			
Over-run width	1.0m			
Central island dia.	26.2m			
Circulatory width/entry width ratio	5.4m (1.2 ratio)			
Design Criteria	Arm 1 A606 (W)	Arm 2 A606 (E)	Arm 3 New Access	
Existing speed limit	NSL	NSL	n/a	NSL=60mph single c/w
Proposed speed limit	n/a	n/a	30mph	Arm 3 speed Limit TBC (assume 30mph)
Design speed	100kph	100kph	60kph	Design speed based on speed limit (no speed data provided)
Approach half width	3.65m	3.65m	3.65m	
No. of entry lanes	1	1	1	
Entry width	4.5m	4.5m	4.5m	
Entry radius	30m	30m	30m	
Effective flare	6.63m	6.25m	6.75m	
Entry angle	55°	29°/2=14.5°	28°/2=14°	
Entry path radius	55.84m	56.24m	61.52m	
Exit radius	40m	40m	40m	
No. of exit lanes	1	1	1	
Exit width	7.08m	7.01m	7m	
Exit width at end of splitter	6.18m	6.27m	6.23m	
Exit taper	-	1 in 15	-	
Stopping sight distance (SSD)	215m	215m	90m	
Forward visibility at entry	40m	40m	40m	
Visibility to the right	40m	40m	40m	



INSET A (Scale 1:250)

KEY PLAN (NTS)



0 5 10 15 20 25m
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PRELIMINARY ISSUE

Client: HANSON

Project Name: KETTON QUARRY EXTENSION

Rev	Description	Date	Drn	Chk
P02	MINOR ADJUSTMENTS TO HAUL ROAD	06.06.2022	DM	IF
P01	PRELIMINARY FIRST ISSUE	30.05.2022	DM	IF

Document Control

Sheet Title: PRELIMINARY DESIGN - ROUNDABOUT GEOMETRY SHEET 1

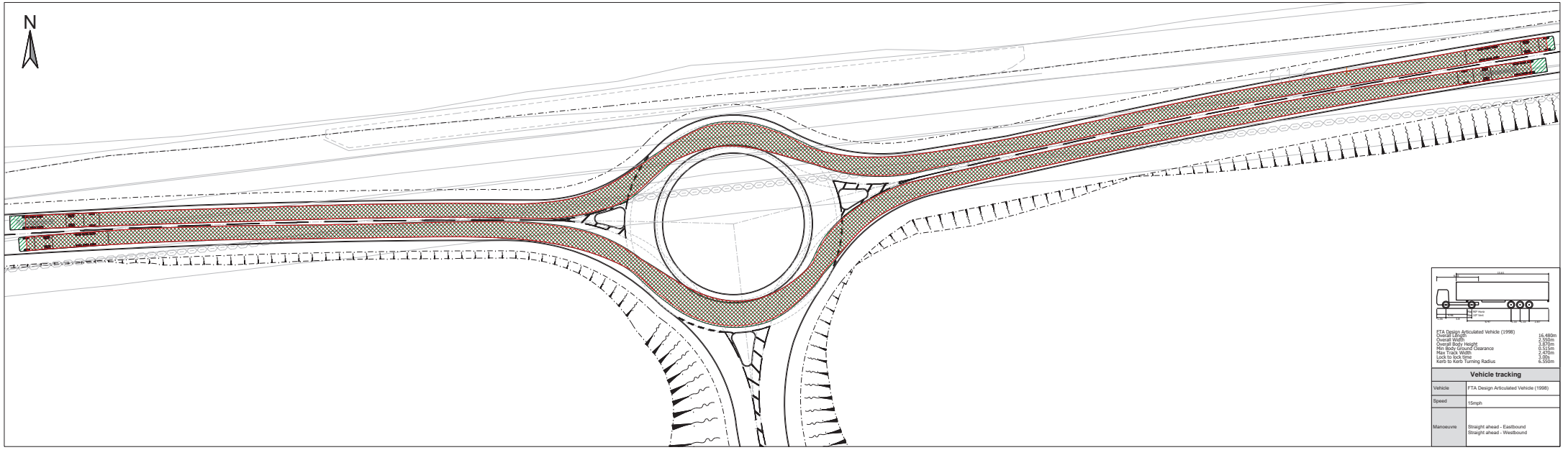
Drawing Office: Tetra Tech Leicester
Executive Park, Avalon Way, Anstey, Leicester, United Kingdom, LE7 7GR
Tel: +44 (0)11 6234 8000
www.tetratecheurope.com

TETRA TECH

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A2	Suitability
784-B033313	DM	24.05.22	IF	30.05.22	IF	30.05.22	As Shown	S2

Client Project Number	Originator	Volume Number	Level/Location	Type Code	Role	Number	Revision
KQE	- TTE	- 00	- XX	- DR	- D	- 0111	P02

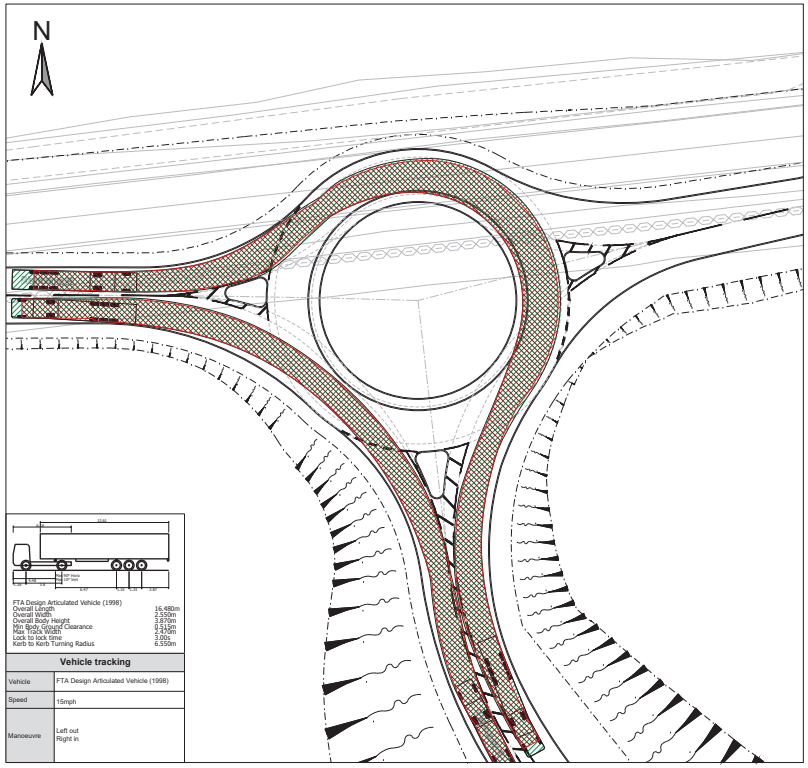
TTR_MT_v1



FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Max Track Width	2.470m
Lock to lock time	3.00s
Kerb to Kerb Turning Radius	6.550m

Vehicle tracking	
Vehicle	FTA Design Articulated Vehicle (1998)
Speed	15mph
Manoeuvre	Straight ahead - Eastbound Straight ahead - Westbound



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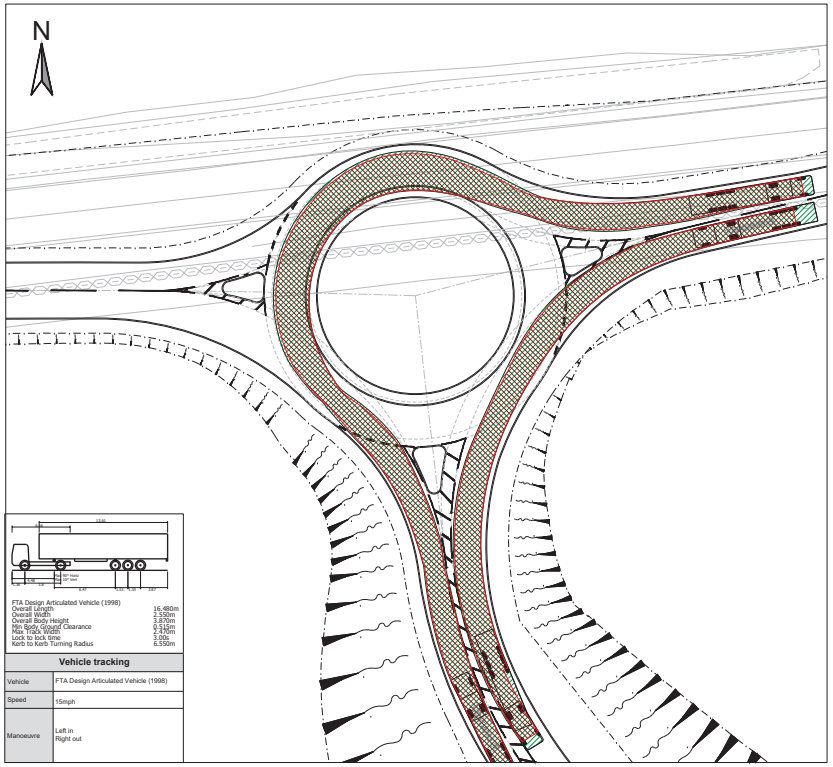
Lock to lock time	3.00s
Kerb to Kerb Turning Radius	6.550m

Vehicle tracking	
Vehicle	FTA Design Articulated Vehicle (1998)
Speed	15mph
Manoeuvre	Left out Right in



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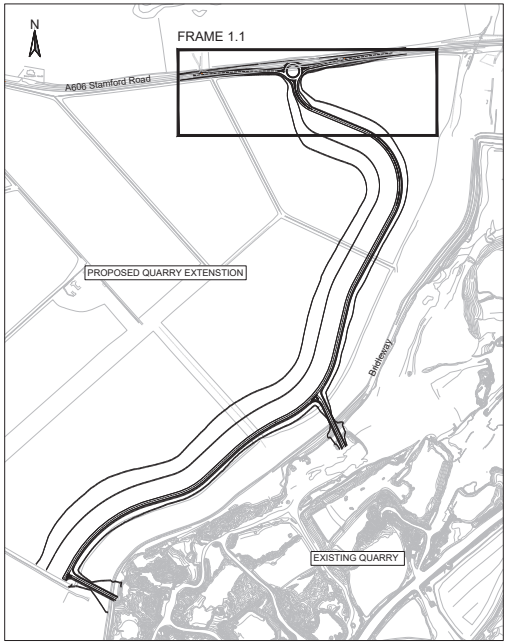
Vehicle	FTA Design Articulated Vehicle (1998)
Speed	15mph
Manoeuvre	Left in Right out

KEY PLAN (NTS)



PRELIMINARY ISSUE

0 5 10 15 20 25m
SCALE 1:500

Client: HANSON

Project Name: KETTON QUARRY EXTENSION

Drawing Title: PRELIMINARY DESIGN - ROUNDABOUT VEHICULAR TRACKING

Rev	Description	Date	Drn	Chkd / Appd
P01	PRELIMINARY FIRST ISSUE	30.05.2022	DM	IF / IF

Document Control

Drawing Office: **Tetra Tech Leicester**
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TETRA TECH

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A3	Suitability
784-B033313	DM	24.05.22	IF	30.05.22	IF	30.05.22	1:250	S2

Client Project Number	Originator	Volume/Zone	Level/Location	Type/Code	Role	Number	Revision
KQE	- TTE	- 00	- XX	- DR	- D	- 0131	P01

TTE_MT_v1

Appendix B – Stage 1 Road Safety Audit

ROAD SAFETY CONSULTING LTD

Stage 1 Road Safety Audit

Grange Top Quarry Extension

Proposed Roundabout

Date: 19/09/2024

Report produced for: Hanson

Report requested by: Tetra Tech

On behalf of: Rutland County Council

Report prepared by: Elaine Bingham, Road Safety Consulting Ltd

Reference: RSC/EB/DL/23240

Document Control Sheet

Project Title	Grange Top Quarry Extension Proposed Roundabout
Report Title	Stage 1 Road Safety Audit Reference: RSC/EB/DL/23240
Revision	
Status	Final
Control Date	19/09/2024

Record of Issue

Issue	Author	Date	Check	Date	Authorised	Date
Final	EB	19/09/24	DL	19/09/24	EB	19/09/24

Distribution

Organisation	Contact	Copies
Tetra Tech	**Pravin Godhania**	Ecopy
Rutland County Council	**Rikki Parsons**	Ecopy

Road Safety Consulting Ltd
4 Paramore Close
Whetstone
Leicestershire
LE8 6EY
Registered in England and Wales
Company Number 5225549

1. Introduction

1.1. This report results from a Stage 1 Road Safety Audit carried out on the proposed roundabout to serve access off the A606 Stamford Road to the Grange Top Quarry in Ketton. The Audit was carried out during September 2024.

1.2. This Road Safety Audit was produced for (client): Hanson, requested by (design organisation): Tetra Tech, on behalf of (overseeing organisation): Rutland County Council.

1.3. The Audit Team membership was as follows:

Audit Team Leader
Elaine Bingham
B Eng (Hons), MCIHT, MSoRSA
National Highways Certificate of Competence (Road Safety Audit)
Road Safety Consulting Ltd.

Audit Team Member
Duncan Lord
IEng, FIHE
National Highways Certificate of Competence (Road Safety Audit)
Consultant working on behalf of Road Safety Consulting Ltd

1.4. The audit took place at the offices of Road Safety Consulting Ltd between the 18th and 19th September 2024. The audit was undertaken in accordance with the Audit Brief. The Audit Brief and Audit Team were approved by Rutland County Council. The report has been prepared with reference to the Design Manual for Roads and Bridges (DMRB) GG 119 Rev 2.

1.5. The Audit Team visited the site together on the 18th September 2024 between 3.00 pm and 4.45 pm. Weather conditions at the time of the audit was sunny. The road surface was dry. Traffic flows were moderate. No pedestrians and no cyclists were observed.

1.6. Rikki Parsons, Highways Engineer (Development Control) representing Rutland County Council also attended the site visit with the RSA Team.

1.7. The audit comprised an examination of the information provided by the Design Organisation and listed in Appendix A.

1.8. The Audit Team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the designs to any other criteria.

1.9. The Road Safety Audit is not a technical check that the design conforms to Standards and/or best practice guidance. Design Organisations are responsible for ensuring that their designs have been subjected to the appropriate design reviews (including, where applicable, Non-Motorised User (NMU) Audits) prior to Road Safety Audit.

1.10. All comments and recommendations are referenced to the design drawing and the locations have been indicated on plans in Appendix B .

2. Items Considered

2.1. Scheme Proposals

2.1.1. The scheme consists of a 3-armed normal roundabout to provide access off the A606 Stamford Road to the Grange Top Quarry in Ketton, as part of their extension plans for the quarry.

2.1.2. The general highway works consists of

- A three-arm roundabout into the site from the A429.
- Alterations to the kerbline in proximity to the three-arm roundabout.
- Splitter islands at the individual arms of the three-arm roundabout

2.1.3. The scheme proposal is shown on drawing KQE-TTE-00-XX-DR-D-0111 Rev P01.

2.1.4. The proposed haul road is not part of this Road Safet Audit.

2.2. Information Provided to the Audit Team

2.2.1. Information that has been provided to the Audit Team, for the purpose of this audit, is as outlined within Appendix A of this report.

2.3. Departures from Standards (Road Safety Audit)

2.3.1. This Road Safety Audit has been produced, with reference to DMRB – GG 119 – Road Safety Audit with the following exceptions.

- Section 4 of this report provides additional Observations, that are outside of the scope of GG119 (which specifically excludes the provision of additional comments within Road Safety Audit report). These comments, whilst considered outside the scope of the audit, have been produced to assist the designer in providing a safe design where any safety comment may be conditional on receiving more detailed information.

2.4. Departures from Standards (Design)

2.4.1. The Audit Team has not been advised of any design departures from standards.

2.5. Items Raised at Previous Road Safety Audits

2.5.1. The Road Safety Audit Team is not aware of any previous road safety audits being carried out on this scheme.

3. Items Raised by this Stage 1 Road Safety Audit

3.1. Problem

Location: A606 westbound approach

Summary: Reduced forward visibility (SSD) may lead to vehicle to vehicle collisions

The forward visibility to a vehicle waiting at the give way line and to the back of the potential vehicle queue for drivers travelling westbound may be restricted by the existing vertical alignment in advance of the roundabout. There is a dip in the carriageway within the proposed forward visibility splay where the roundabout may be hidden momentarily for approaching drivers. (The provided long section for this approach shows SSD for 160m back from the centre of the ICD). Poor perception of the presence of a stationary vehicle on the A606 and the roundabout ahead may lead to late braking shunt type collisions or late braking loss of control type collisions. (Also see Problem 3.4 below)

Recommendation:

It is recommended that appropriate forward visibility splays in both horizontal and vertical planes to the give way and to the back of the potential vehicle queue are provided consistent with measured free flow 85th percentile vehicle speeds and should be secured within highway authority control. If required visibility is not achievable, additional measures should be provided to reduce vehicle approach speeds consistent with available forward visibility (SSD).

3.2. Problem

Location: A606 approaches

Summary: High approach speed may lead to loss of control type collisions

The A606 approaches to the roundabout are relatively straight followed by a sharp curve to the left to provide a tight entry path curvature (55.84m eastbound and 56.24m westbound). This may lead to sudden braking and loss of control type collisions.

Recommendation:

It is recommended that the horizontal alignment for the A606 approaches to the roundabout are altered so that there is not a sudden sharp curve to provide the entry path deflection.

3.3. Problem

Location: A606 westbound approach

Summary: Off- line roundabout may create a 'see through' effect leading to an increased risk of collisions.

Drivers/riders approaching the new roundabout, may see along the line of the old road alignment and hedgerows, and in conjunction with the fairly straight approach may lead to drivers/riders being misled to the approaching re-alignment and roundabout ahead. This could lead to sudden manoeuvres, late braking and in turn lead to loss of control and shunt type collisions.

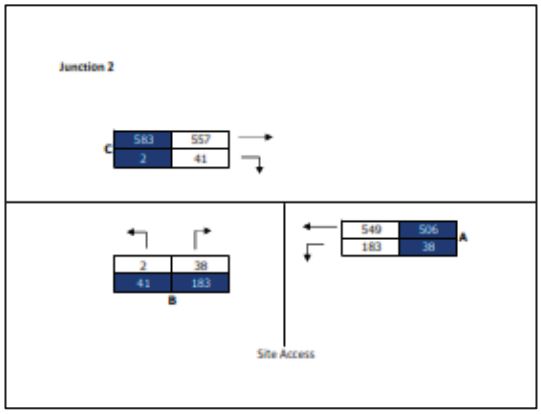
Recommendation:

It is recommended that measures are included on the approach and on the central island to assist driver interpret the new layout of the off-line roundabout. Measure could include but not limited to the provision of landscaping in the redundant carriageway and chevrons signs on the roundabout.

3.4. Problem

Location: East/West approaches to the roundabout

Summary: Risk of failure to give way and rear end shunt collisions



When viewing the forecast flows when the quarry is likely to be in full operation (2055 onwards) suggests that in the morning and evening peak periods few vehicles will be making a right turn into the site and few vehicles will be making a right turn out in the morning peak. The Audit Team are concerned that the imbalance in turning proportions could manifest in westbound and eastbound drivers assuming they have priority and proceed, failing to acknowledge the occasional vehicle making a right turn to and from the site, resulting in failure to give way or late braking rear end shunt type collisions.

Recommendation:

It is recommended that the additional measures are included to slow entry speeds and warn of the turning quarry traffic.

End of Safety Comments

4. Issues identified during the Stage 1 Road Safety Audit that are outside the Terms of Reference

4.1. ISSUE

Location: General

Reason considered to be outside the Terms of Reference: Detail Design

This section of the A606 is subject to a 60mph (National Speed Limit). It is recommended that the designers ensure that sufficient areas have been set aside to provide adequate signing of the junction and onward destinations, along with any required protection measures or requirement for passively safe equipment is considered at this stage of the design.

5. Audit Team Statement

We certify that this Stage 1 Road Safety Audit has been carried with reference to GG 119 Rev 2.

Audit Team Leader

Elaine Bingham
B Eng (Hons), MCIHT, MSoRSA
National Highways Certificate of Competence (Road Safety Audit)
Road Safety Consulting Ltd.

Signed: E. Bingham Dated 19th September 2024

Director of Road Safety Consulting Ltd

Audit Team Member

Duncan Lord
IEng, FIHE
National Highways Certificate of Competence (Road Safety Audit)

Signed: D Lord Dated 19th September 2024

Consultant working on behalf of Road Safety Consulting Ltd

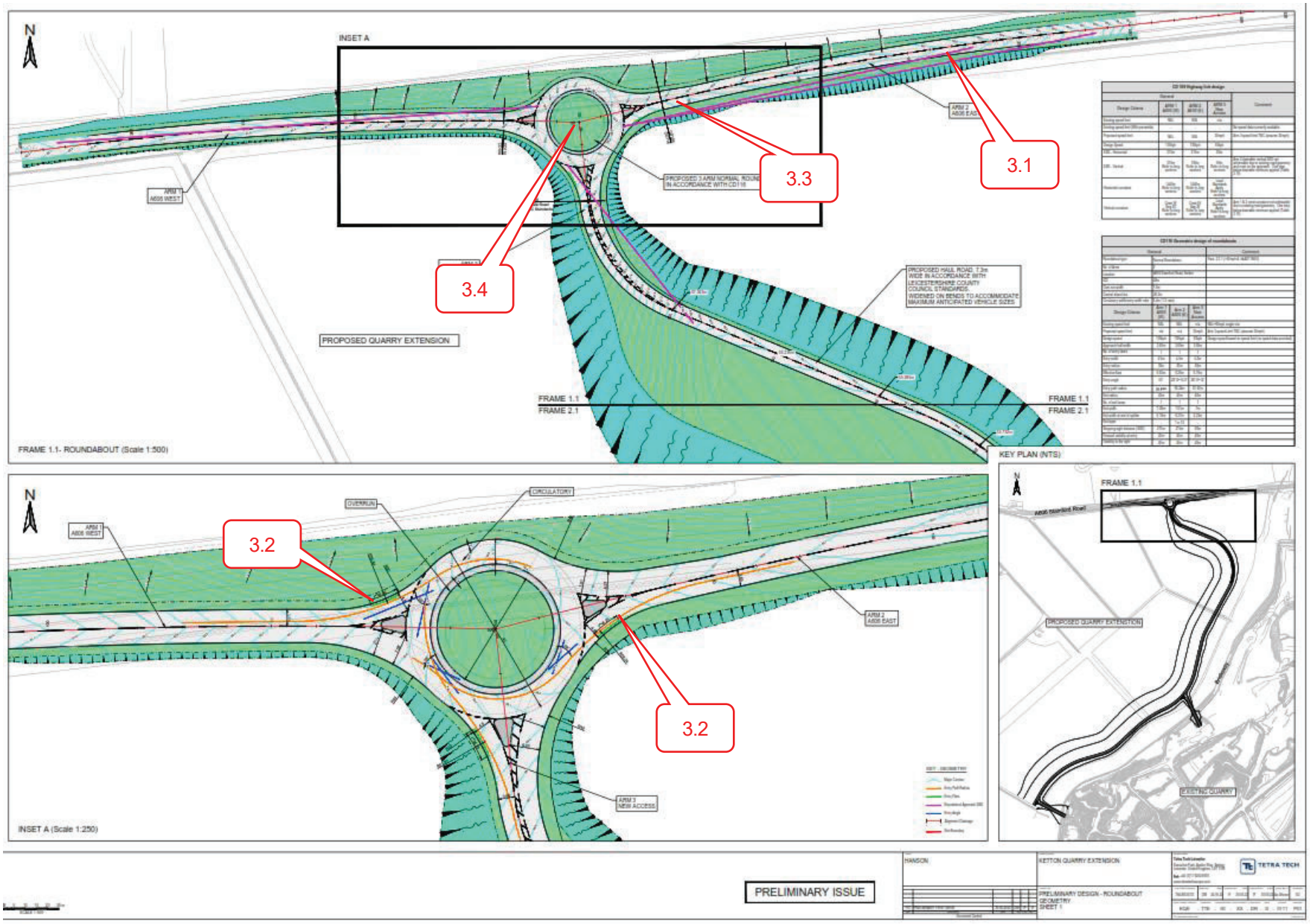
Road Safety Consulting Ltd
4 Paramore Close
Whetstone
Leicestershire
LE8 6EY

APPENDIX A: Information Provided

List of Information Provided

Drawing Reference Number	Revision	Title
KQE-TTE-00-XX-DR-D-0110	P02	Key Plan
KQE-TTE-00-XX-DR-D-0111	P01	Geometry Sheet 1
KQE-TTE-00-XX-DR-D-0112	P01	Geometry Sheet 2
KQE-TTE-00-XX-DR-D-0121	P01	Long Sections Sheet 1
KQE-TTE-00-XX-DR-D-0122	P01	Long Sections Sheet 2
KQE-TTE-00-XX-DR-D-0123	P01	Long Sections Sheet 3
KQE-TTE-00-XX-DR-D-0131	P01	Roundabout Vehicular Tracking
Document Reference Number	Revision	Title
	1	Stage 1 Audit Brief
	4	Transport Assessment

APPENDIX B: Drawing Showing Problem Locations


N
INSET A
3.1
3.3
3.4
PROPOSED QUARRY EXTENSION
FRAME 1.1
FRAME 2.1
FRAME 1.1- ROUNDABOUT (Scale 1:500)
KEY PLAN (NTS)
3.2
3.2
INSET A (Scale 1:250)
PRELIMINARY ISSUE

Ketton Quarry, Rutland

Stage 1 Road Safety Audit – Designer's Response Report

B033313-TTE-XX-XX-RP-0003-P02

For Approval

Heidelberg Materials UK

Date: 9th Oct 2024

Prepared on Behalf of Tetra Tech Limited. Registered in England number: 01959704

Tetra Tech Leicester, 4th Floor, Great Central Square, Vaughan Way, Leicester, LE1 4JS
Tetra Tech Limited. Registered in England number: 01959704
Registered Office: 3 Sovereign Square, Sovereign Street, Leeds, United Kingdom, LS1 4ER

tetratecheurope.com

Document control

Document:	Stage 1 Road Safety Audit – Designer's Response Report
Project:	Ketton Quarry, Rutland
Client:	Heidelberg Materials UK
Job Number:	B033313

Revision:	**P01**	**Status:**	**S0**
Date:	09/10/2024		
Prepared by: Nabeel Muhamed Nadukkavil	**Checked by:** Ian Frost	**Approved By:** Ian Frost	
Description of revision: First Issue			

Revision:	**P02**	**Status:**	**S4**
Date:	12/09/2025		
Prepared by: Nabeel Muhamed Nadukkavil	**Checked by:** Ian Frost	**Approved By:** Ian Frost	
Description of revision: Decision Log updated with OO Response and Agreed RSA action			

TETRA TECH

CONTENTS

1.0 INTRODUCTION

1.0 This report presents the Designer's Responses to the problems raised within the Stage 1 Road Safety Audit (RSA) [Report Ref: RSC/EB/DL/23240].

1.1 The scheme consists of a 3-armed normal roundabout to provide access off the A606 Stamford Road to the Grange Top Quarry in Ketton, as part of their extension plans for the quarry.

1.2 The general highway works consists of

- A three-arm roundabout into the site from the A429.
- Alterations to the kerbline in proximity to the three-arm roundabout.
- Splitter islands at the individual arms of the three-arm roundabout

2.0 KEY PERSONNEL

2.1 Key personnel are detailed within the table below:

Organisation	Details
Overseeing Organisation	Rutland County Council
RSA Team	Elaine Bingham B Eng (Hons), MCIHT, MSoRSA National Highways Certificate of Competence (Road Safety Audit) Road Safety Consulting Ltd. Duncan Lord IEng, FIHE National Highways Certificate of Competence (Road Safety Audit) Consultant working on behalf of Road Safety Consulting Ltd
Design Organisation	Nabeel Muhamed Nadukkavil – Assistant Engineer, Report Author, Tetra Tech Ltd Ian Frost – Associate, Report Checker & Approver, Tetra Tech Ltd

3.0 ROAD SAFETY AUDIT DECISION LOG

3.0 Refer to Appendix A for the Stage 1 RSA Decision Log.

4.0 DESIGN ORGANISATION AND OVERSEEING ORGANISATION STATEMENTS

4.0 The following statements are to be signed by the design organisation and the Overseeing Organisation.

Design Organisation statement.

On behalf of the Design Organisation, I certify that: 1) The RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the Overseeing Organisation	
Name:	Ian Frost
Signed:	
Position:	Associate
Organisation:	Tetra Tech
Date:	12/09/25

Overseeing Organisation statement

On behalf of the Overseeing Organisation, I certify that: 1) The RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the Design Organisation. 2) The agreed actions will be progressed.	
Name:	Rikki Parsons
Signed:	
Position:	Highways Engineer, Development Control
Organisation:	Rutland County Council
Date:	12/09/2025

5.0 APPENDICES

5.1 APPENDIX A

Stage 1 RSA Decision Log

GG 119 - ROAD SAFETY AUDIT DECISION LOG

Revision : P03

RSA Stage:	1
Project:	Katton Quarry, Rutland
Client:	Heidelberg Materials UK
Overseeing Organisation (OO):	Rutland County Council
Design Organisation (DO)	Tetra Tech
Audit Ref.:	RSC/EB/DL/23240

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RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Further Design Organisation responses	Further Overseeing Organisation Response	Agreed RSA Action
RSA1 - Problem 3.1 **Location:** A606 westbound approach **Summary:** Reduced forward visibility (SSD) may lead to vehicle to vehicle collisions. The forward visibility to a vehicle waiting at the give way line and to the back of the potential vehicle queue for drivers travelling westbound may be restricted by the existing vertical alignment in advance of the roundabout. There is a dip in the carriageway within the proposed forward visibility splay where the roundabout may be hidden momentarily for approaching drivers. (The provided long section for this approach shows SSD for 160m back from the centre of the ICD). Poor perception of the presence of a stationary vehicle on the A606 and the roundabout ahead may lead to late braking shunt type collisions or late braking loss of control type collisions. (Also see Problem 3.4 below)	It is recommended that appropriate forward visibility splays in both horizontal and vertical planes to the give way and to the back of the potential vehicle queue are provided consistent with measured free flow 85th percentile vehicle speeds and should be secured within highway authority control. If required visibility is not achievable, additional measures should be provided to reduce vehicle approach speeds consistent with available forward visibility (SSD).	Accept the RSA problem. The forward visibility has been assessed using future year forecast queuing on the A606 Stamford Road. This demonstrates that the appropriate forward visibility can be achieved to the back of the predicted queues.	Design organisation comments not accepted. It's noted that the the design organisation has considered forward visibility for the back of the queue for future forcast. However they haven't considered what happenns when there is no queue or until the future forcast arrives. The design organisation should carry out 85%ile speed surveys in accordance with CA 185 as requested by the Audit team. The applicant will then need to reduce the speed limit on the approach to the roundabout to 40mph. This will need to be carried out in accordace with Rutland County Councils TRO process, a grampian condition can be proposed to ensure that the 40mph TRO is secured. The 40mph limit will ensure that the 160m SSD is achievebale to the back of the queue and the roundabout.	The forward visibility has been shown for both the scenarios i.e., to the give-way line and to the back of the predicted queue as previously requested. Previously submitted drawings have been attached again. Further speed surveys in accordance with CA185 will be undertaken as part of the detailed design process and technical approval. A Grampian condition would not be acceptable in terms of planning as it is unlikely that it would satisfy the requirements for a deliverable condition. Details of any contributions can be discussed with client. Any speed limit change will not alter the geometry and the 160m visibility is still achievable.	Comments accepted by the Design organisation. 85th%ile speed surveys should be completed in accordance with CA 185 and provided as part of the detailed design. Any shortfall in the forward visibility to the back of the queue or give way line (SSD) then additional meansures will be required to mitigate for 85%ile speeds. Point closed for now, further review will be required at technical vetting stage through the S278 process and RSA 2.	Undertake further speed surveys at detailed design to inform the detailed design.
RSA1 - Problem 3.2 **Location:** A606 approaches **Summary:**High approach speed may lead to loss of control type collisions. The A606 approaches to the roundabout are relatively straight followed by a sharp curve to the left to provide a tight entry path curvature (55.84m eastbound and 56.24m westbound). This may lead to sudden braking and loss of control type collisions.	It is recommended that the horizontal alignment for the A606 approaches to the roundabout are altered so that there is not a sudden sharp curve to provide the entry path deflection.	Disagree with the RSA problem and recommendation raised. The proposed roundabout has no abnormal sharp curves or where drivers would be required to abruptly change direction. All elements of the roundabout design complying with the relevant design guidance (DMRB CD 116 & CD 109).	The overseeing organisation disagrees with the design organisation. The entry paths to the roundabout are not correct and not in line with CD 116. To accord with the details of clauses 3.24 and 3.25 the applicant will need to reduce the speed limit of the road to 40mph. If this is the case then a grampian condition can be imposed as per problem 3.1 above.	Not correct. Clauses 3.24 & 3.25 relate to compact roundabouts. Proposed design is for a normal roundabout. In any case, both clauses 3.24 & 3.25 state that entry path radius shall not exceed 70m or 100m respectively. Our proposal has entry path radii of 55.84m, 56.24m and 61.52m respectively which complies with clause 3.26 which applies to our design and stipulates entry path radius shall not exceed 100m.	Comments from Design organisation accepted. Design is in accordance with national standards however it can still have points raise on the RSA. It's highly unlikely that vehicles will be travelling at the posted limit in this location, especially on the approach to the roundabout. Entry paths radius isn't likely to be a issue. 85%ile speed survey as per point 3.1 will aid in the assessment of this problem and I would suggest that this is further reviewed at detailed design stage. It should be noted that the applicant has provided a significant amount of detail, and this is normally a point that would be discussed as part of a Stage 2 audit. With the above in mind, I am content to close this point out and further review as part of the RSA 2 and technical review process as part of the S278 process.	Review at detailed design stage
RSA1 - Problem 3.3 **Location:** A606 westbound approach **Summary:** Off- line roundabout may create a 'see through' effect leading to an increased risk of collisions. Drivers/riders approaching the new roundabout, may see along the line of the old road alignment and hedgerows, and in conjunction with the fairly straight approach may lead to drivers/riders being misled to the approaching re-alignment and roundabout ahead. This could lead to sudden manoeuvres, late braking and in turn lead to loss of control and shunt type collisions.	It is recommended that measures are included on the approach and on the central island to assist driver interpret the new layout of the off-line roundabout. Measure could include but not limited to the provision of landscaping in the redundant carriageway and chevrons signs on the roundabout.	Accept the RSA problem and recommendations made by the RSA team. Planting and bund already proposed as part of Site Preparation Plan Ref: KE-ANN-SITEPREP.	Not accepted at this time. Plan number KE-ANN-SITEPREP needs to be provided for review. It doesnt appear to be provided on the planning portal on within the information pack to the overseeing organisation.	See attached.	Noted, landscaping and chevron signage on the roundabout to be discussed and reviewed as part of the S278 technical review. Point closed – further review at detailed design stage.	Review at detailed design stage
RSA1 - Problem 3.4 **Location:** East/West approaches to the roundabout **Summary:** Risk of failure to give way and rear end shunt collisions. When viewing the forecast flows when the quarry is likely to be in full operation (2055 onwards) suggests that in the morning and evening peak periods few vehicles will be making a right turn into the site and few vehicles will be making a right turn out in the morning peak. The Audit Team are concerned that the imbalance in turning proportions could manifest in westbound and eastbound drivers assuming they have priority and proceed, failing to acknowledge the occasional vehicle making a right turn to and from the site, resulting in failure to give way or late braking rear end shunt type collisions.	It is recommended that the additional measures are included to slow entry speeds and warn of the turning quarry traffic.	Accept the RSA problem but suggest an alternative solution to potentially include enhanced lining and signing. This would be discussed with Highway Authority and assessed during detailed design.	Comments noted from the design organisation however signs and lines won't be enough to reduce the entry speed on the aproach to the roundabout. Noting the points above, the applicant should reduce the speed on the approach to the roundbaout to 40mph. A grampian condition can be recommended to secure the TRO change for the speed limit as per problems 3.1 and 3.3 above.	RSA problem is related to unbalanced traffic flows rather than approach speeds. The geometry of the roundabout will result in vehicles slowing down through the circulatory carriageway. However, further signing and lining will be proposed at detailed design to highlight the entrance to the quarry. Again, any changes to the speed limit can be discussed further as mentioned above.	Comments noted from Design organisation, signage and lining to be reviewed as part of the detailed design stage during the S278 technical review. Point closed – Further review as part of the detailed design and the Stage 2 audit.	Review at detailed design stage

APPENDIX 7 – GEOARCHAEOLOGY: OUTLINE WSI

KETTON GEOARCHAEOLOGY: OUTLINE WSI

Nature of the Site bedrock and superficial geology

1. Bedrock geology consists of a sequence of shallow water limestones and estuarine sediments that consists of the Upper Lincolnshire Limestone Member, the Rutland Formation and Blisworth Limestone Member. These bedrock geologies are likely to have an impact on the nature of the palaeoenvironmental material that is preserved at the Site. Where sediments are sat on the limestone formations, they may encourage the preservation of shell and bone for example. Furthermore, limestones will have been subject to dissolution and the formation of sinkholes and gullies that may contain sediments of Pleistocene age.

2. Elsewhere on site British Geological Survey mapping indicates the presence of superficial sediments including till (glacial deposits) from a middle Pleistocene glaciation. The age of this glaciation is unknown at present. No outcrops of till were observed in the Site visit.

Previous work

3. A series of potential sinkhole features had been previously noted and examined by MoLAS at the Site. These were found to be shallow in nature. Further sinkhole like features were seen in a site walkover in the quarry face in the south eastern part of the quarry (Plates 1 and 2). These were seen to be filled with sediments that probably date (at least in part) to the Pleistocene. The features were filled with fine grained sediments, and a number of discrete units were seen to be present in the features. Sediments infilled the features to at least a depth of 3m and the larger feature was up to 20m wide. At this point the nature of the sediments, and indeed whether they are of Pleistocene age is conjectural but appears a strong possibility.

4. Finally, magnetometry survey of the norther area has suggested the presence of gullies, natural geological features, cut into the top of the limestone. In places these gullies appear to be 5m wide. At present their fill and nature of the sequences is unknown.

Mitigation of sedimentary sequences

5. The investigation of the Site from a geoarchaeological perspective is designed to understand the nature of the sediments at the Site, their distribution, age and palaeoenvironmental setting in order to understand their Palaeolithic archaeological potential and derive a methodology for looking for Palaeolithic artefacts in any sequences present. This will entail the following:

6. Investigation of the large sinkhole like features. Any such feature in an area of quarrying will be investigated through test pitting and/or stepped trenching to allow access to the feature. Sediments should be investigated through a

dating program as well as being sampled for both archaeological and biological content.

7. Investigation of the gullies. Such features are known elsewhere in the UK (for example on the Lower Greensand in SE England) to contain Neanderthal archaeology. Consequently, a representative selection of these features should be test pitted in advance of quarrying to establish their age, biological potential and archaeological significance.

8. Investigation of till. Should any till be identified at the Site it should be test pitted and sampled for dating.

9. Because the features present at the Site are of unknown age, and in order to avoid assessment and sampling of deposits unlikely to contain Palaeolithic archaeology (for example because the sediments are too old) the implementation of the test pitting strategy for both the sinkholes and gullies is likely to be a two phase project involving initial test pitting and dating followed by subsequent work to mitigate any features found to be of have Palaeolithic archaeological potential.

Outline strategy

10. Preliminary investigation (Phase 1) of gullies and sinkholes identified on the geophysical survey. Geophysical survey has outlined a number of features across the Site thought to be of geological rather than human origins. A sample of these features will be test pitted by machine excavation for the recovery of samples suitable for dating and palaeoenvironmental assessment. Ten test pits will be dug through a minimum of 5 gully like features. These features are likely to be relatively shallow, and it is not anticipated at this time the test pits will need to be stepped. Two large, stepped trenches will be dug into larger sinkhole like features. These features are known to be deep and will require at least two or three steps to access the basal parts of the sequence. This phase of works are not primarily designed to address the Palaeolithic archaeological potential but will be excavated in a manner suitable for recovering artefacts if present. Because of the lead time in obtaining dates from Pleistocene sequences Phase 1 works need to happen at least 8 months prior to Phase 2 works. Assessment of samples and dates from Phase 1 works will inform the necessity or otherwise of the Phase 2 works.

11. Mitigation (Phase 2) works are dependent on the results of Phase 1 works and will only be undertaken if either Phase 1 works produced archaeological material or the Works demonstrated that the sediments date to time periods in which Palaeolithic occupation of Britain is known to occur (i.e. sediments older than about 1 mya are unlikely to produce Palaeolithic archaeological material according to our current understanding of the human occupation of the British Isles).

12. In tandem with this phased investigation of the quarry it will be necessary to undertake regular monitoring of the quarry in order to record unexpected features that may contain Palaeolithic archaeological material. The phasing of these works will be dependant on quarry schedules etc.

Phase 1

13. Test pits through the gullies will be dug by a mechanical excavator with a 1-2m wide toothless ditching bucket. Each test pit will be one bucket-width wide, 3–4m long and up to 1.5m deep. Excavation will cease at a shallower depth if the base of the Pleistocene deposits has been reached. Excavation will cease if primary context Palaeolithic evidence is encountered, and the County Archaeological Service informed.

14. Each test pit will be taken down in horizontal spits of 25cm, respecting the interface between sedimentary units when unit changes are encountered. The work will be directed by a recognised specialist in Palaeolithic archaeological/Pleistocene geological excavation with experience of recording and interpreting Pleistocene sediments, who will record and number the sequence of sedimentary units as excavation progresses following standard descriptive practices. Test pits will be entered if safe to record the stratigraphy. If needed the trench will be widened and stepped to allow access for sampling.

15. Spit-samples of at least 100 litres will be numbered, their position in the stratigraphic sequence recorded, and set aside at regular 25cm intervals as excavation progresses. 100 litres from each spit-sample will be dry-sieved on site through a 1cm mesh for recovery of lithic artefacts and faunal remains. If the sediment encountered is not suitable for dry sieving (i.e., too clayey), excavation will proceed in shallower spits of 5cm, looking carefully for the presence of any archaeological evidence, and the spit samples will also be carefully investigated by hand (using archaeological trowels) for any archaeological evidence. The remainder of the spit-sample may be sampled for palaeo-environmental biological remains, if appropriate.

16. The presence/potential for palaeo-environmental micro-biological evidence such as pollen, insects, molluscs and small vertebrates will be assessed for each sediment unit by field inspection. Such evidence, if present, is of critical importance to the potential of a site, and it is necessary to establish presence/quality as part of the evaluation process. Different forms of evidence are present in different types of sediment, and an important aspect of the work of the Palaeolithic/geo-archaeological specialists is to consider the potential of the sediments encountered, and to guide the sampling as appropriate. Provision has been built into the archaeological programme for processing any samples taken and reporting on the results at the evaluation stage.

17. Consideration of the sediments for their suitability for optically stimulated luminescence dating (OSL) or other forms of dating will be given. This phase of

the Works is primarily focused on dating and it is anticipated that a dating specialist will be on site to recover samples and data for dating the sequences. This is the most suitable approach in order for the OSL specialist to take in situ dosimetry readings.

18. A representative section from each test pit will be photographed once excavation has reached its full depth, and at appropriate stages in the course of excavation if features of interest are revealed.

19. Each test pit will be dug in turn, and backfilled level with the pre-existing ground surface as soon as possible following excavation and the completion of recording. No test-pits will be left open untended or overnight.

20. Two stepped trenches are to be excavated in the area of the solution hollows. These will be machined in a similar fashion to the test pits. The purpose of the stepping is to allow access to the base of the trench. Stepping of the trenches will enable safe access to the sediments to their full depth. A maximum depth per step will be 1.2m or less depending on the stability of the profile. Step width will mirror step depth. A maximum depth of 4.5m will be excavated by this method.

21. A drawn profile will be made of the long profile of each trench.

22. Detailed recording and palaeoenvironmental sampling will be undertaken in each trench (as outline above for the test pits). All sedimentary units will be sampled and recorded. Samples will also be taken where appropriate for OSL dating and other dating methods.

23. In the event of significant archaeological deposits being encountered the County Archaeologist is to be informed immediately. Further limited excavation may be required to clarify the nature, character and date of the archaeological deposits.

24. The above methodology can be varied if considered necessary by the Palaeolithic specialist and/or the geoarchaeological specialist. Any variations will be agreed with the County Archaeologist.

Phase 2

25. Depending on the results of the Phase 1 works additional fieldwork might be required to further evaluate any Quaternary deposits at the Site. Test pits will be dug through the gullies will be dug by a mechanical excavator with a 1-2m wide toothless ditching bucket in a similar fashion to the Phase 1 test pits. Each test pit will be one bucket-width wide, 3–4m long and up to 1.5m deep. Excavation will cease at a shallower depth if the base of the Pleistocene deposits has been reached. Excavation will cease if primary context Palaeolithic evidence is encountered, and the County Archaeological Service informed. An additional WSI will be required in in situ Palaeolithic artefacts are encountered.

26. Each test pit will be taken down in horizontal spits of 25cm, respecting the interface between sedimentary units when unit changes are encountered. The work will be directed by a recognised specialist in Palaeolithic archaeological/Pleistocene geological excavation with experience of recording and interpreting Pleistocene sediments, who will record and number the sequence of sedimentary units as excavation progresses following standard descriptive practices. Test pits will be entered if safe to record the stratigraphy. If needed the trench will be widened and stepped to allow access for sampling.

27. Spit-samples of at least 100 litres will be numbered, their position in the stratigraphic sequence recorded, and set aside at regular 25cm intervals as excavation progresses. 100 litres from each spit-sample will be dry-sieved on site through a 1cm mesh for recovery of lithic artefacts and faunal remains. If the sediment encountered is not suitable for dry sieving (i.e., too clayey), excavation will proceed in shallower spits of 5cm, looking carefully for the presence of any archaeological evidence, and the spit samples will also be carefully investigated by hand (using archaeological trowels) for any archaeological evidence. The remainder of the spit-sample may be sampled for palaeo-environmental biological remains, if appropriate.

28. The presence/potential for palaeo-environmental micro-biological evidence such as pollen, insects, molluscs and small vertebrates will be assessed for each sediment unit by field inspection. Such evidence, if present, is of critical importance to the potential of a site, and it is necessary to establish presence/quality as part of the evaluation process. Different forms of evidence are present in different types of sediment, and an important aspect of the work of the Palaeolithic/geo-archaeological specialists is to consider the potential of the sediments encountered, and to guide the sampling as appropriate. Provision has been built into the archaeological programme for processing any samples taken and reporting on the results at the evaluation stage.

29. Although dating will have been carried out as a prime aim of the Phase 1 works consideration of the sediments for further dating will be made at this point if Palaeolithic artefacts are encountered.

30. A representative section from each test pit will be photographed once excavation has reached its full depth, and at appropriate stages in the course of excavation if features of interest are revealed.

31. Each test pit will be dug in turn, and backfilled level with the pre-existing ground surface as soon as possible following excavation and the completion of recording. No test-pits will be left open untended or overnight.

Intermittent watching brief

32. Recording of Quaternary sediments exposed in the quarry faces within the extension will be undertaken at intervals through the lifespan of the quarry. This will be undertaken at pre-determined intervals depending on the timing and nature of quarrying in this part of the Site. These will be undertaken by a specialist Quaternary geoarchaeologist and/or Palaeolithic archaeologist. A framework of monthly visits to the Site will be undertaken to monitor and record sequences.

33. Site visits will be timed in order to examine, record and sample (as appropriate) representative sections through any exposed sediments in order to obtain a definitive record of the deposits present before extraction. This will be achieved through:

- Recording of strip logs of representative sections along quarry faces, including photographic record.
- Mapping of the position of faces during site visits.
- Photography of key faces for potential photogrammetric modelling
- Taking of samples for palaeoenvironmental investigation
- Taking of samples for dating

34. Close examination of faces and spoil for evidence of either human activity (stone tools) or large mammal remains will be undertaken. Should either material be observed the area will be cordoned off by fencing and the County Archaeologist will be informed. Recording and sampling of deposits in the quarry face will be arranged with the quarry and an appropriate safety strategy put in place to work at the quarry face.

Assessment of archaeological material

35. Should any archaeological finds be made during the monitoring they will be recorded, described and interpreted by a suitable Palaeolithic archaeologist (Dr Matt Pope, Archaeology South East). If significant archaeological material is recovered and excavation of said material is needed a separate WSI will be prepared covering the archaeological material.

Post-fieldwork assessment methodology

36. Within two weeks of the completion of each phase of fieldwork, a short site summary shall be prepared. This report will summarise the findings of the

fieldwork and highlight any implications of the findings for subsequent phases of fieldwork/monitoring.

37. Following completion of the Phase 1 site works, all archaeological records, environmental samples and finds will be collated by the Quaternary Geoarchaeologist and an assessment report prepared. Samples for assessment will be identified and objectives of any assessment will be considered prior to processing, dispatch and/or analysis as appropriate. Stable finds (e.g. flints, bone) will be washed, marked and packaged prior to dispatch. Unstable finds will be dispatched for remedial conservation as a prelude to assessment, and bulk samples will be dispatched for processing. Samples for dating will be identified and given high priority given the time taken to produce dates.

38. Formal assessment of contained biological materials will take place concurrently with the dating. The assessment will detail the research potential of any recovered artefact assemblage and environmental samples. This work will provide the detailed palaeoenvironmental and chronostratigraphic context for the Site, into which any archaeological finds can be placed. The main methods that will be used are described below (but others may be required once fieldwork has been undertaken).

Pollen: provides information on palaeoenvironment and palaeoclimate, through identification of floral taxa.

Insects: provides information on palaeoenvironment and palaeoclimate, through identification of insect remains.

Ostracods: provides information on palaeoenvironment, palaeoclimate and biostratigraphy, through identification of changes in ecological niches.

Diatoms: provides information on palaeoenvironment and palaeoclimate, through identification of changes in specific ecological niches.

Waterlogged plant remains: provides information on the palaeoenvironment through identification of plant remains.

Vertebrate remains: provides information on the palaeoenvironment and biostratigraphy through time.

Molluscs: provides information on the palaeoenvironment through identification of terrestrial/freshwater mollusc remains.

Optically Stimulated Luminescence dating: provides a chronological context for the palaeoenvironmental materials and alluvial chronostratigraphy.

Amino Acid Geochronology: provides a chronological framework for the deposits based on AAR on Bithynia opercula.

Further reporting will follow the Phase 2 works (if required) and will follow the procedure outlined above.

Reporting

39. An assessment report for each phase of the quarry works will include the following minimum information:

- A non-technical summary.
- HER number, site code and project number.
- Planning reference number.
- Grid reference, site location, topography and geology.
- Archaeological and historical background.
- A statement of aims and objectives of the project.
- A description and analysis of the fieldwork undertaken.
- A geo-referenced location plan at a minimum scale of 1:10,000.
- Scaled section and plan drawings of features encountered within the excavated area.
- Discussion and conclusions, including the importance of the findings in local, regional and national basis and a critical review of the effectiveness of methodology.
- Tables summarising features and artefacts with full descriptions and brief interpretation.
- Specialist artefact and environmental reports, as necessary, with reference made to appropriate published type-series.
- Colour photographs, including general views and appropriate detail.
- Acknowledgements.
- Bibliography of sources used.
- Archive deposition location and agreed deposition date.
- A summary of the report's presence and location on the OASIS online database.

40. Copies of the approved report shall be sent to the HER officer and the. If required a second report, documenting the analysis of the assessed materials, will subsequently be prepared.

41. The data from the project, along with a digital copy of the report/s, will be uploaded to the Archaeology Data Service OASIS (Online Access to the Index of archaeological investigations) database for public consultation.

42. Deposition of the report/s with the HER, where it will be incorporated into their database for public consultation and uploading the project data to OASIS will be considered as placing the results of the project in the public domain. However, wider publication of the results will be considered, although the content and place of publication will be dependent on what is found and be subject to discussion with the archaeological advisor to the planning authority. For example, where a significant discovery is made, consideration will be given to the preparation of a short note for inclusion in a local journal. Consideration at this stage of the Works as to the integration of this phase of works with the other on-going works from other areas of the Site should be made.

43. Working under the terms of the Copyright, Design and Patents Act 1988, the authors shall retain full copyright with regard to written, digital and graphic material.

44. Following acceptance of the report/s, an inventoried project archive (documentary and material) will be prepared in accordance with the guidelines contained in Guidelines for the Preparation of Excavation Archives for Long Term Storage (UKIC 1990) and Standards in the Museum Care of Archaeological Collections (Museums and Galleries Commission 1992), and the guidelines in the Deposition of archaeological archives in *[**to be agreed**]*.

45. The entire archive will be prepared by the author until digital deposition with the receiving museum of County Stores can be arranged. The *[**to be agreed**]* curatorial team has been made aware of the upcoming works and will be contacted again at the post-excavation assessment stage to discuss the archiving requirements, as per the deposition guidelines.

APPENDIX 8 – DRAFT CONSTRUCTION ECOLOGICAL MANAGEMENT PLAN (CEMP)

FELSTONE CONSULTING
CHARTERED LANDSCAPE ARCHITECTS

DRAFT CONSTRUCTION AND ECOLOGICAL MANAGEMENT PLAN ('CEMP') FOR THE PROPOSED EXTENSIONS TO GRANGE TOP QUARRY

Heidelberg Materials

October 2025

Felstone Consulting Limited

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TABLES

1 INTRODUCTION AND SCOPE OF REPORT

1.1 Introduction

1.1.1 Felstone Consulting Limited (Felstone) has been instructed by Heidelberg Materials to prepare an initial draft Construction and Ecological Management Plan ('CEMP') for the proposed extensions to Grange Top Quarry, for construction and use of a new access and site access road from the A606, a security gatehouse, bridleway bridge and associated works to facilitate the continued supply of minerals to Ketton Cement Works, the consolidation of existing mineral extraction permissions and a restoration scheme to recreate agricultural land and carry out biodiversity enhancement works.

1.1.2 This initial draft CEMP has been prepared in response to post-submission discussions with the Local Planning Authority, Rutland County Council, relating to planning application 2024/0066/MIN which was validated January 2024.

1.1.3 The development proposals were described within the submitted Planning Statement prepared by Landesign (January 2024) and accompanied by a set of phased working and restoration drawings (prepared by Felstone). The revised set of drawings in Table 1, overleaf, is to be submitted to the planning authority, following receipt of the consultation responses.

1.1.4 An Ecological Impact Assessment prepared by Heatons (August 2023) was submitted as part of the Environmental Statement, with supporting Preliminary Ecological Appraisal (with Phase 1 Habitat Survey), Bat, Reptile, Badger, Wintering Bird and Breeding Bird surveys and reports in the Technical Appendices.

1.1.5 Due to time lapsed an updated walkover survey was completed by Heatons in August/September 2025. This has been compiled into a separate report and using UK Hab descriptions (hereafter referred to 'Heatons Ecology Update 2025 report') and has been used to inform this draft CEMP, where relevant.

Table 1.1: Revised Proposed Development Drawing List

Drawing Reference	Rev	Drawing Title	Date
F14-REST	A	Field 14 - Indicative Final Restoration	April 2025
F14-SECTIONS	A	Field 14 - Illustrative Cross Sections	April 2025
F14-SECTIONS-KL	A	F14 - Illustrative Cross Section KL	April 2025
F14-SITEPREP- REVA	A	Field 14 - Indicative Site Preparation Plan	April 2025
F14-WORKINGPLAN	A	Field 14 - Working Plan	April 2025
F14-YR1	A	Field 14 - Indicative Year 1	April 2025
F14-YR5	A	Field 14 - Indicative Year 5	April 2025
F14-YR10	A	Field 14 - Indicative Year 10	April 2025
F14-YR15	A	Field 14 - Indicative Year 15	April 2025
F14-YR20	A	Field 14 - Indicative Year 20	April 2025
F14-YR25	A	Field 14 - Indicative Year 25	April 2025
MASTERPLAN - REST	A	Indicative Masterplan - Final Restoration Plan	April 2025
MASTERPLAN - SITE PREP	A	Indicative Masterplan - Site Preparation	April 2025
MASTERPLAN - YEAR 1	A	Indicative Masterplan - Year 1	April 2025
MASTERPLAN - YEAR 5	A	Indicative Masterplan - Year 5	April 2025
MASTERPLAN - YEAR 10	A	Indicative Masterplan - Year 10	April 2025
MASTERPLAN - YEAR 15	A	Indicative Masterplan - Year 15	April 2025
KE-MASTERPLAN - YEAR 20	A	Indicative Masterplan - Year 20	April 2025
MASTERPLAN - YEAR 25	A	Indicative Masterplan - Year 25	April 2025
NW-REST	A	Northwest Land - Final Restoration	April 2025
NW-SECTIONS	A	Northwest Land - Illustrative Cross Sections	April 2025
NW-SECTIONS-B	A	Northwest Land - Illustrative Cross Section IJ	April 2025

KE-NW-SITEPREP	A	Northwest Land - Indicative Site Preparation Plan	April 2025
NW-WORKING PLAN	A	Northwest Land - Indicative Working Plan	April 2025
NW-YR1	A	Northwest Land - Year 1	April 2025
NW-YR5	A	Northwest Land - Year 5	April 2025
NW-YR10	A	Northwest Land - Year 10	April 2025
NW-YR15	A	Northwest Land - Year 15	April 2025
NW-YR20	A	Northwest Land - Year 20	April 2025
NW-YR25	A	Northwest Land - Year 25	April 2025
KE-ROW	B	Proposed Public Access Summary	April 2025
F14-PARADISE FIELD		Field 4 - Paradise Field Inset	April 2025

1.2 Aims and Structure of CEMP

1.2.1 The aim of this initial draft CEMP is to ensure that potential impacts on habitats and of nature conservation importance are avoided and/or mitigated for throughout the works.

1.2.2 This CEMP sets out the specific measures proposed at the site and is structured as follows:

- Summary of Ecological Constraints;
- Proposed Construction Works; and
- Protection of Designated Sites, Habitats and Species.

1.3 Project Team

1.3.1 This CEMP has been prepared by Chartered Landscape Architects at Felstone Consulting Limited, a Registered Practice with the Landscape Institute, with input from Heidelberg Materials' in-house Natural Resources and Operations Departments, retained consultants at Landesign and Ecologists at Heatons.

1.3.2 The Phase 1 Habitat Surveys of the proposed extension areas were originally undertaken by Heatons in May 2021, with updates in July and August 2022. Bat surveys were also carried out in April and October 2022, a badger survey in February 2022, and breeding and wintering bird surveys over several visits in 2022. These formed technical appendices to the Ecological Impact Assessment submitted with the planning application.

1.3.3 Update walkover habitat surveys have subsequently been undertaken in accordance with UK Hab descriptions by Heatons in August and September 2025 (refer to Heatons Ecology Update 2025 report).

1.3.4 Annual reporting, licensing and mitigation work on the existing Grange Top Quarry site are being managed on Heidelberg Materials' behalf by Ecology Services UK Ltd (ESUK).

2 SUMMARY OF ECOLOGICAL CONSTRAINTS

2.1 Overview of Development

2.1.1 The proposals comprise three main elements, the two quarry extensions and a new Works access road connecting to the A606 at Shacklewell, via a new roundabout.

2.1.2 The proposed quarry extension at Field 14 sits to the south of Empingham Road, between Ketton village and Wytchley Warren cottages. It occupies c. 39 ha and contains approximately 4.5 million tonnes of viable clay overlying 6 million tonnes of limestone.

2.1.3 The proposed quarry extension at NW Land sits between the Works and the A606 at Shacklewell. It comprises c. 109 hectares with nearly 28 million tonnes of high-carbonate limestone. There is no clay in NW Land.

2.1.4 Extensive landscape works are proposed on the site boundaries. This will be achieved through a combination of allowing existing hedges to grow tall and additional tree planting behind important hedges to create a denser visual screen, and the use of landscaped and tree-planted soil mounds around the edge of the workings to add both visual and acoustic screening.

2.1.5 The restoration of both the existing quarry and extensions will be undertaken using overburden and soils from the quarry. There is no need to import any restoration materials to deliver the restoration scheme.

2.1.6 Final restoration will return most of the site to agriculture with some areas becoming calcareous grassland/pasture and other areas returning to arable farming. Quarry faces will be restored using overburden although some faces will be retained for their habitat value.

2.1.7 Restoration will be progressive with stripped soils being directly placed into worked-out phases wherever possible. In this way, by 2060, most of the site will already be well restored with only the final phases remaining.

2.2 Designated Sites

Internationally Designated Statutory Sites – Rutland Water RAMSAR and SPA

2.2.1 Rutland Water RAMSAR and Special Protection Area (SPA) is located approximately 1.4km to the west of the NW boundary and approximately 3.5km to the north-west of

the Field 14 boundary. The main reasons for designation includes a large artificial reservoir fringed by mosaic wetland habitat which supports important populations of breeding, wintering and passage birds.

Statutory Sites – Shacklewell Hollow SSSI and Ketton Quarries SSSI

2.2.2 As shown on each of the NW Land development drawings, the edge of Shacklewell Hollow Site of Special Scientific Interest (SSSI) is located approximately 60m to the east of the NW Land extraction area boundary. The main designated habitats are broadleaved, mixed and yew woodland, calcareous grassland, fen, marsh and swamp, and neutral grassland.

2.2.3 As shown on each of the Field 14 development drawings, the edge of Ketton Quarries SSSI, is opposite Field 14 on the northern side of Empingham Road (approximately 40m to the north), extending over the existing quarry. The main designated habitats are broadleaved, mixed and yew woodland, calcareous grassland and earth heritage. The closest unit of ecological value is located approximately 580m to the north of the 'Field 14' boundary. The quarry haul route from Field 14 will follow the existing quarry haul route which crosses this designation.

2.3 Site Habitats

NW Land

2.3.1 The following habitats are present within the NW Land (based on the Heatons Ecology Update 2025 report):

- Cereal crops;
- Modified grassland;
- Developed land; sealed surface;
- Other woodland; broadleaved;
- Native hedgerow; and
- Native hedgerow with trees.

Field 14

2.3.2 The following habitats are present within the Field 14 (based on the Heatons Ecology Update 2025 report):

- Cereal crops;
- Modified grassland;
- Arable field margins – game bird mix;
- Developed land; sealed surface;
- Other woodland; broadleaved;
- Other woodland; mixed;
- Native hedgerow with trees- associated with bank or ditch;
- Native hedgerow with trees; and
- Native hedgerow.

2.4 Protected Species

Amphibians

2.4.1 Refer to Heatons' Technical Appendix 1.1 and Heatons Ecology Update 2025 report for further details about the suitability of habitats on site for amphibians. No waterbodies were noted within the NW Land boundary; however, 11 waterbodies were identified within 500 m.

2.4.2 No waterbodies were noted within the Field 14 boundary; however, seven waterbodies were identified within 500 m. Two of the ponds have been surveyed as part of the permitted Field 16 workings and were confirmed as great crested newt (GCN) breeding ponds.

2.4.3 The hedgerow bases, grassland and woodland blocks in both areas provide suitable refuge for GCN. However, it should be noted that the cereal crop land is regularly managed, and the modified grassland area (within Field 14) was regularly grazed with livestock.

Reptiles

Refer to Heatons' Technical Appendix 1.3 for further details about reptile surveys carried out on site. The hedgerows, grassland edges and woodland were considered to provide suitable refuge, foraging and commuting grounds for reptile species. Additionally, no reptiles were noted during the survey effort.

Bats

2.4.4 Refer to Heatons' Technical Appendix 1.2 for further details about bat surveys carried out on site. In summary, during the updated walkover (Heatons Ecology Update 2025 report from August/September 2025), following the updated Bat Conservation Trust Guidelines (2024) there were two groups of trees within the NW Land and nine assessed trees and five groups of trees in and within close proximity to the Field 14 boundary that provide Potential Roost Features (PRF) for bats or Further Assessment Required (FAR). The woodland edge, hedgerows, grassland and arable field margins in both areas provide suitable commuting and foraging habitat for bats.

2.4.5 A total of six species at NW Land and seven bat species were recorded within the bat surveys at Field 14 (both during the transect surveys and static monitoring). The species recorded on site include common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, Nathusius' pipistrelle *Pipistrellus nathusii*, noctule *Nyctalus noctula*, serotine b *Eptesicus serotinus*, *Myotis species* and Daubenton's *Myotis daubentonii*.

Badgers

2.4.6 Refer to Heatons' Confidential Technical Appendix 1.4 for further details about badger surveys carried out on site.

Other Mammals

2.4.7 A number of other notable mammals were identified during the updated walkover survey (Heatons Ecology Update 2025 report from August/September 2025), including roe deer *Capreolus capreolus*, fallow deer *Dama dama* and brown hare *Lepus europaeus*. The cereal crops, grassland, woodland, arable field margins and hedgerows were considered to provide suitable commuting, foraging and resting opportunities for mammals.

Birds

2.4.8 Refer to Heatons' Technical Appendix 1.5 and 1.6 for further details about bird surveys carried out on site. The hedgerows, woodland, grassland, arable field margin – game bird mix and cereal crops as well as scattered trees provide suitable habitat for a variety of common and opportunistic bird species. In addition, the cereal crops and the arable field margins – game bird mix also provide suitable nesting and foraging habitat for one red list bird of conservation concern, skylark *Alauda arvensis*. However, it should be noted that the cereal crop land is regularly managed, and the modified grassland area (within Field 14) was regularly grazed with livestock.

2.4.9 During the wintering bird survey effort, the total number of species observed was 35 at NW Land and 37 at Field 14. This includes notable species designated on the red/amber list/Schedule 1 or Section 41 status, such as yellowhammers *Emberiza citrinella and* linnets *Linaria cannabina*.

2.4.10 During the breeding bird survey effort, the total number of species observed was 39 at NW Land and 36 at Field 14. This included notable species, designated on the red/amber list/Schedule 1 or Section 41 status.

Invertebrates

2.4.11 Refer to Heatons Ecology Update 2025 report for further details about the suitability of habitats on site for invertebrates.

2.4.12 Notable invertebrate species were returned within close proximity to the NW land boundary, including dingy skipper *Erynnis tages* and grizzled skipper *Pyrgus malvae*. No notable invertebrate species were returned within 2km of the Field 14 boundary.

2.4.13 The hedgerow, grassland, arable field margins – game bird mix and woodland were considered to provide some suitable habitat for various invertebrate species. However, due to the management, they are not considered to support large assemblages of invertebrates.

Relevant Wildlife Legislation

2.4.14 A summary of relevant wildlife legislation is provided in Table 2.1, below.

Table 2.1: Summary of relevant legislation

Receptor/Species of Concern	Legislation
Amphibians	All amphibian species receive a degree of protection under the Wildlife and Countryside Act 1981 (as amended). GCN are also protected as a European Protected Species under the Conservation of Habitats and Species Regulations 2017 (as amended).
Reptiles	All reptiles are protected under Wildlife and Countryside Act 1981 (as amended) and Natural Environment and Rural Communities Act 2006 (as amended).
Bats	All bat species are legally protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended).
Badgers	Badgers are their setts are legally protected under the Protection of Badgers Act 1992.
Other mammals	Brown hare are listed under Priority Species under the UK Post-2010 Biodiversity Framework. They are also protected under Schedule 10A of the WCA 1981 (as amended), Ground Game Act 1880, Game Act 1831 and Hares Preservation Act 1892. Hedgehogs are protected under Section 41 of the NERC Act 2006, Section 11 (1) of Schedule 6 of the WCA 1981 (as amended) and the Wild Mammals Protection Act 1996. Roe and fallow deer are protected on the UK under the Deer Act 1991, Agriculture Act 1947 and Schedule 7 of the WCA 1981 (as amended).
Birds	All breeding birds, their eggs, nests and young are protected under the Wildlife and Countryside Act 1981 (as amended)
Invertebrates	All invertebrate species receive a degree of protection under the Wildlife and Countryside Act 1981 (as amended) and Natural Environmental and Rural Communities Act 2006 (as amended). Some invertebrates are protected as a European Protected Species under the Conservation of Habitats and Species Regulations 2017 (as amended), these include: • Large blue butterflies (eggs, caterpillars, chrysalises and adults); • Fisher's estuarine moths (eggs, caterpillars, chrysalises and adults); and • Little ramshorn whirlpool snails.

3 PROPOSED CONSTRUCTION WORKS

3.1 Quarry Extensions

3.1.1 The proposed extension areas will be worked concurrently to enable effective use of the geological resources (High Carbonate Limestone, High Silica Limestone, Mixed Clays and Silica Clays).

3.1.2 Mineral extraction will comprise the stripping of overburden including soils, clays and Blisworth Limestone, the removal of mixed clay (cement making) and silica clay (mainly for restoration works) and the extraction of the underlying limestone.

3.1.3 As each phase progresses, restoration materials will be directly placed into worked-out areas, so that the restoration can follow quickly behind the active working areas extraction.

3.1.4 NW Land – Overview:

- Hedgerow to be cleared in advance of construction of Proposed Roundabout onto Stamford Road;
- Construction of a new purpose-built roundabout onto A606 Stamford Road;
- Soils from the initial 'box cut' phase and from roundabout construction to be placed into 3m high bunds within a landscape buffer to the north, grass seeded and planted;
- Box cut will be a shallow c. 4m deep base of the new site access road. This will hide the new access road traffic from view and screen Shacklewell Hollow SSSI from the site traffic;
- Creation of landscape buffer along Stamford Road to include tree and shrub planting, grassland and natural regeneration of mixed scrub;
- Creation of landscape buffer along western and southern boundaries to include tree and shrub planting;
- Creation of landscape buffer along the eastern boundary to include tree and shrub planting, grassland and natural regeneration of mixed scrub;

- Standoffs to Shacklewell Hollow SSSI (broadleaved, mixed and yew woodland);
- Sections of hedgerows to be cleared in advance of soil stripping;
- Vegetation to be cleared in advance of construction of proposed bridleway crossing point for HGVs;
- Vegetation to be cleared in advance of construction of the proposed bridleway crossing bridge over the internal haul road (for quarry plant and vehicles);
- Construction access for most works, including soil stripping and landscaping, is expected to be via the existing quarry access. Construction of the roundabout may require short term direct access off the A606 to a temporary compound close to the roundabout location, inside NW Land; and
- Construction of the bridleway bridge will require a temporary diversion bridleway E226. This will be done before NW Land becomes fully operational to ensure that there is little traffic crossing the temporary diversion route.

3.1.5 Field 14 - Overview:

- Landscape buffer around Wytchley House and Wytchley Warren Cottages to the north. To include retained trees (as shown), topsoil from the initial phase placed into a 3m high bund to extend existing, with species rich grass seeding and additional tree and shrub planting;
- Landscape buffer along the northern boundary to Empingham Road to include tree and shrub planting to strengthen existing hedgerow;
- Landscape buffer along the eastern boundary to include existing tree and shrub planting and rough grassland margin;
- Landscape buffer along the western boundary to include tree and shrub planting to strengthen the existing hedgerow;
- Topsoil to be stripped to average 0.3m thickness from the initial phase and placed into bund within landscape buffer to the north. Subsoil and overburden to be stripped to average 4.15m thickness from the initial phase and placed into bunds in the final phase alongside Empingham Road;

- Soils and overburden from the initial phase to be placed into bunds (up to 5m high) within the final phase and alongside Empingham Road, and seeded with a grass/wildflower mix; and,

- Construction access for the development of Field 14 will be from within the existing quarry.

3.2 New Site Access Road and Roundabout

3.2.1 A new site access road will link the works directly to the A606 at Shacklewell. This will comprise a new 7.3m wide, two-way, tarmacked road across the existing quarry and NW Land extension area and will join the A606 at a new roundabout on the A606 west of Shacklewell Hollow. This will be constructed to County Council Highway standards, though will be private and not for public use. The new access will also cross the line of bridleway E226 as a bespoke 'at grade' bridleway crossing.

3.2.2 The design rationale for the road is as follows:

- Ensure the minimum safe width for road vehicles;

- The tarmac surface is hard-wearing and will minimise erosion/rutting and dust, with potential impacts on adjacent habitats;

- Suitable road surface and kerb edging will ensure that the vehicles are contained to the route and do not track over adjacent habitats.

3.2.3 The construction works for the road will include the following operations:

- Ground clearance/excavation of roadbed – using a tracked excavator with arisings to be loaded into dumper and taken to quarry extension areas and used as restoration backfill and/or soil cover;

- Build up sub-base (dependent on ground conditions), delivered by dumper, spread by tracked excavator and compacted in by vibratory roller;

- Install kerb edges, haunched in concrete and drainage items, with delivery and laying of tarmac to engineers specification; and,

- Clear and tidy site, reinstate edges to marry in with kerbs. Apply soil and grass seed, to establish appropriate verges.

3.3 Environmental Protection Measures

3.3.1 This section of the CEMP summarises the proposed environmental protection measures:

- Topographical survey work and checks at all stages of setting out each phase of working and/or construction operation in relation to the location of the Shacklewell Hollow SSSI designation boundary;
- The Ecological Clerk of Works (ECoW) will check for any protected species in advance of construction operation and then as necessary supervise the works where they are adjacent to particularly sensitive areas;
- The construction works will be timed to avoid potential impacts to species as identified by the ECoW;
- The ECoW will provide toolbox talks to Heidelberg Materials' Quarry Manager and all contractor's personnel, as necessary (e.g. daily basis to report on any findings, concerns, priorities, etc);
- A strict working area will be clearly marked and agreed with the contractor prior to the commencement of works. No plant, machines or materials will be allowed to leave the agreed working area;
- Dust management – suppression of dust will be carried out as necessary:
- Fuels will be stored at a location to be agreed with Heidelberg Materials' Quarry Manager. Re-fuelling will only take place at this location;
- Materials will be carefully handled and stored to avoid damage to any areas alongside the agreed working area;
- Landscaping and restoration on land adjacent to work area will be carried out at the end of construction;
- Road maintenance will comprise use of a road sweep where required and the periodic scraping up of any build-up of materials arising from vehicle tyres by means of loading shovel bucket. Any such scraping will be carried out carefully to avoid spillage out onto the adjoining habitats and to the sides of the working area.

Sediment run off will also be reviewed throughout the site operations and appropriate management determined as necessary; and

- Once operational, the new road will be subject to an appropriate speed limit set depending upon the quarry operational safety requirements.

4 PROTECTION OF DESIGNATED SITES, HABITATS AND SPECIES

4.1 Designated Sites

Internationally Important Statutory Sites – Rutland Water RAMSAR and SPA

4.1.1 The works do not necessitate a direct change in habitat and/or features at Rutland Water RAMSAR and SPA. Indirect impacts (including noise, dust and hydrology) towards Rutland Water RAMSAR and SPA during the works is considered negligible.

4.1.2 Any potential indirect impacts to the designated site would be further mitigated through the environmental protection measures described in this document.

Statutory Sites – Shacklewell Hollow SSSI and Ketton Quarries SSSI

4.1.3 The works do not necessitate a direct change in habitat and/or features at Shacklewell Hollow SSSI due to the standoffs from construction works.

4.1.4 The works do not necessitate a direct change in habitat and/or features at Ketton Quarries SSSI, as the haul route from Field 14 already exists as part of the current quarry operations.

4.1.5 Any potential indirect impacts to the designated habitats within the above statutory designated sites would be further mitigated through the environmental protection measures described in this document.

4.2 Site Habitats

4.2.1 The phased loss of other woodland; broadleaved, other woodland; mixed habitat will be mitigated for through advanced woodland planting (to take place prior to removal) and the phased creation of additional woodland within the phased restoration proposals.

4.2.2 The phased loss of modified grassland and arable field margins – game bird mix habitats will be mitigated for through the creation of like-for-like habitat and/or habitats of higher distinctiveness within the perimeter landscape buffers and phased restoration proposals.

4.2.3 The phased loss of native hedgerows, native hedgerow with trees and native hedgerows with trees – associated with bank or ditch will be mitigated for through

advanced species-rich hedgerow planting, the enhancement of retained hedgerows on site and the phased creation of additional hedgerows.

4.3 Protected Species

4.3.1 The ecological risk of each activity is assessed and measures for reducing the impact are detailed below. The timings of sensitive works to avoid harm to the main biodiversity features of concern can be found in Table 4.1 below. The requirements for the presence of a suitably licenced/experienced Ecological Clerk of Works (ECoW) are also identified. This table does not negate the need for European Protected Species Licenses (EPSL) where required.

Table 4.1: Timings of sensitive works

Receptor/species of concern	Timing of works	ECoW presence required
Birds – Clearance of bird nesting habitat (cereal crops, arable field margins – game bird mix, woodland, hedgerows and grassland edges)	Between September and February	No ECoW required (unless breeding birds identified during works)
	Between March and August	ECoW required
Badgers and other mammals – clearance of suitable habitat (woodland, arable field margins – game bird mix, hedgerows and grassland) and operations within 30m	Throughout the works in these areas	ECoW required
Amphibians and reptiles – clearance of suitable habitat (grassland, woodland, hedgerow)	Between March and October	ECoW required
	Between November and February	ECoW required – no disturbance to hibernacula features during these dates.
Bats	Throughout any works within 30m of any potential roosting features. This buffer is increased to 100m for any blasting activities and to 50m during the hibernation season for any works in proximity to a tree with PRF-M or hibernation potential.	ECoW required

4.3.2 Additional precautionary methods to reduce the impact on biodiversity features can be found in Table 4.2, below.

Table 4.2: Recommended precautionary methods

Receptor/species of concern	Timing of works	Recommended precautionary methods
Birds	Between September and February	• Any nests found, contact the ECoW. No attempt should be made to move the nest or birds/eggs and all personnel should move away from the area to avoid stressing the bird(s) further.
	Between March and August	• No removal of suitable habitat (cereal crops, arable field margins – game bird mix, woodland, hedgerows and grassland) to avoid nesting bird season. • If not possible, nesting bird check will be required 24 – 48 hours prior to vegetation removal. Where nesting birds are present, a 'no work' buffer will be implemented, and the nest monitored by a suitably experienced Ecologist until all chicks have fledged. No attempt should be made to move the nest or birds/eggs and all staff should move away from the area to avoid stressing the bird further.
Badgers and other mammals - CONFIDENTIAL	Throughout the works	• If any potential signs of badger are noted, contact ECoW. • Works should be carried out during daylight hours, where possible; • Ramps within open excavations to avoid badger/mammal entrapment (minimum a 45-degree angle and in place at least every 20m); • Reduction in speed limits (5mph); • Appropriate storage methods for chemicals; • Cap any exposed pipes overnight and when contractors are off site for more than two hours; • Any stockpiled material/soil bund must be checked for evidence of badgers each day prior to any movement onto or off the bund; • Removal of hedgerow and shed/stables should be sensitively undertaken, clearing small sections at a time. If badger setts or potential setts are identified, works should cease and Heatons ecology team should be contacted; • Ensure no works to be carried out within 30m of known sett within woodland and hedgerow (or within 30m of any potential setts identified during works); and • If signs of badger are found, contact ECoW.

Reptiles / Amphibians	Between March and October. When temperatures are over 5°C overnight and above 10°C during the day (for a minimum of 5 days prior to and during works)	• An area should be identified ahead of works as a 'receptor' area away from current/future works for the ECoW to move animals, if required, during works. • If any opportunistic reptiles/amphibians are found, works are to cease in that area, and the situation reviewed by the EcoW to determine most appropriate course of action.
	Between November and February. When temperatures are under 5°C overnight and 10°C during the day (for a minimum of 5 days prior to works)	• Cautious removal of suitable habitat (including grassland, woodland and hedgerows) to avoid harming opportunistic reptile and amphibian species; and • Any reptiles/amphibians found, contact ECoW.
Bats	Between May to August	• No removal of suitable roosting habitat without a licence/Ecology advice and survey(s). • No removal of habitat within 30m of any PRF-M trees (100m for blasting). • Any bat(s) found, works must cease, the bat(s) should not be touched and should be observed from a distance to ensure its location is known at all times and advice sought from the ECoW as soon as it is safe to do so.
	Between September to April	• No removal of suitable roosting features/habitats without licence/Ecology advice and surveys and no works within 50m of suitable hibernation or PRF-M features.
Invertebrates	Between April and June	• Cautious cutting / topping operations (which involve removal of nectar-bearing flowers) during this time - no applications of herbicides to large areas of vegetation. • No use of insecticides – at any time.

Vegetation Clearance

Potential Impacts

4.3.3 To facilitate the proposed development (including soil stripping, mineral extraction and re-profiling works), areas of woodland, grassland, cereal crops, arable field margins – game bird mix and hedgerows will be removed. This has the potential to impact amphibians, reptiles, bats, birds, badgers and invertebrates.

Measures to Minimise Impacts

4.3.4 The contractor shall carefully set out/agree the areas of vegetation clearance with the ECoW in advance of commencing the works. An ECoW should be onsite on day one (if suitable bat features are set to be removed, a licenced ecologist is required) to provide a toolbox talk and discuss/approve work activities and/or methods.

4.3.5 To minimise the risk to breeding/wintering birds, sensitive timing of works and/or required ECoW presence will be adhered to during the vegetation clearance and removal of sand banks. Refer to Table 4.1 for the timings of sensitive works.

4.3.6 To minimise the risk to foraging/commuting bats, precautionary measures will be adhered to during the works. To minimise the risk to roosting bats, prior to each phase (or works within 50m of suitable roosting habitat - 100m for blasting), a bat licenced ecologist should perform an aerial inspection of any features deemed to be FAR (or PRF-M). Refer to Table 4.2 for details. Precautionary measures for avoiding damaging hedgerows and trees onsite will be adhered to during the works. Additionally, woodland blocks within close proximity to the NW land and Field 14 are set to be retained with a suitable buffer from the proposed works, according to BS 5837:2012. The exclusion zones may be enforced by the use of physical barriers, in accordance with BS5837. Where any particularly vulnerable trees are present along this boundary, tree protection boxes may be installed to provide further protection. Warning signs should be utilised to ensure all on site are aware of the exclusion zones.

4.3.7 To minimise the risk to badgers, ECoW presence during any works within 50m of a badger sett or potential sett is required. An updated badger survey is also required to prior to the commencement of each phase. The results of the updated survey(s) will be used to inform the Proposed Works in order to protect badgers and their setts, and other mammals on site. Precautionary measures will be adhered to during the works.

Refer to Table 4.2 for details. Additionally, woodland blocks within close proximity to the NW land and Field 14 are set to be retained with a suitable buffer from the proposed works. Warning signs should be utilised to ensure all on site are aware of the presence of badger setts, and any necessary construction exclusion zones put in place around badger setts.

4.3.8 All waste/arisings from the vegetation clearance shall be carefully disposed of. Where possible green waste will be composted/recycled either on or off-site.

General Construction Processes (Earthworks and Landscape)

Potential Impacts

4.3.9 Direct and indirect impacts to both protected/notable species and habitats can arise from general construction processes, such as pollution, dust, noise and lighting.

Measures to Minimise Impacts

4.3.10 Good site management, as described below, will minimise the risk of general construction activities to both protected/notable species and habitats.

4.3.11 This will include careful handling and storage of materials to minimise potential pollution, for example:

- Ensuring that chemicals and fuels are stored in suitable containers, with accompanying COSHH datasheets as required;
- Access routes and temporary lay down areas will be carefully agreed in advance to avoid more sensitive parts of the site (with suitable speed limits in place);
- Refuelling, only on hardstanding or other approved areas, away from watercourses and drains; and
- Ensuring that vehicles and plant are secure from leakage and spillage. If spillage occurs, take appropriate action. Spill kits must be provided during all works.

4.3.12 Plant and machinery will be properly maintained, with quiet settings/silencers, and switched off when not in use. Dust suppression will be carried out as necessary, for

example, use of a water bowser on haul routes during dry periods. Good practice relating to plant and machinery include:

- Giving consideration to noise emissions when selecting or modifying the plant and equipment used on site, with quieter variants given preference;
- Using and maintaining plant in accordance with the manufacturer's instructions and best practice;
- Switching off vehicles and machinery when not in use, and avoiding the revving of engines; and
- Instructing all personnel on best practice measures to reduce noise and vibration as part of their induction training and following up with 'toolbox talks' as needed.

4.3.13 All aspects of works will be conducted in such a manner to minimise the generation and spread of dust and sand into the surrounding area, including the following:

- Stockpiled material will be kept away from the hedgerows, trees and woodland on site;
- Stockpiled materials which are susceptible to wind erosion will be dampened down, seeded or covered to ensure satisfactory protection and dust control;
- Excessive exhaust emissions will be controlled by ensuring that all plant is correctly adjusted and checked as being in good working order prior to use and is adequately maintained; and,
- Airbourne dust will be kept to a minimum, for example by the regular use of a water spray system and wetting down access roads.

4.3.14 If working outside of daylight hours, most notably during the winter months, the light should be as low as H&S permits. A 2m 'dark' buffer from any suitable bat habitats should be maintained throughout the works:

- LED luminaries should be used, where possible;
- A warm white spectrum should be adopted to reduce the blue light component, where possible;

- All lighting must be directional and positioned sympathetically to avoid light spill onto retained trees, hedgerows and woodland habitats;
- All lighting should be installed with PIR/motion sensors to avoid light pollution when not needed;
- The times during which the lighting is on should be limited to provide some dark periods, particularly during the peak in bat activity (20:00 – 23:00hrs between April and September); and
- If lighting is not absolutely necessary, then it shouldn't be used.

4.3.15 All waste will be managed appropriately, and rubbish and debris removed regularly to keep the site and works area clean and tidy. All surplus hazardous materials and their containers regularly removed for disposal off-site in a safe and competent manner and in accordance with relevant regulations.

4.4 Biodiversity Protection Zones

Bats

4.4.1 As detailed previously, the retained areas of trees may be protected with protection zone/fencing in accordance with BS 5837 which will help to reduce disturbance to any roosts. Additionally, there will be no night working, where possible, if required see paragraphs above and ecology advice should be sought ahead of any works required between dusk and dawn. The trees on site with potential roost features, and the main commuting/foraging routes highlighted during the 2023 survey effort, will not be affected by lighting changes. A Dust Management Plan (DMP) will be produced and adhered to, to ensure changes in dust levels do not impact the use of any potential bat roost features within the site boundary or in close proximity

4.4.2 Tables 4.1 and 4.2 must be adhered to and no works to or in proximity to any potential roosting features can take place without suitable survey, advice or mitigation/licencing is in place.

4.4.3 Further protection of any retained woodland within 100m of blasting, or other buffers as per Table 4.2, will be considered.

Badgers - CONFIDENTIAL

4.4.4 Best practice guidance dictates use of heavy machinery should not take place within 30m of any potential sett(s), use of lighter machinery within 20m, and use of hand tools or vegetation clearance within 10m.

Birds

4.4.5 Any nests found (including those of ground nesting birds) should be assessed by a suitably experienced ECoW and shall keep a minimum 5m 'no work' buffer (depending on species, the size of the buffer may change). The nests will be monitored by an ECoW until the chicks have fledged. No attempt should be made to move the nest, birds, or eggs, and all staff should move away from the area to avoid stressing the bird further.

Other Mammals

4.4.6 Although they are not directly protected, it is good practice to ensure works do not risk harming hedgehogs/other mammals. Any open excavations should include ramps to avoid entrapment (minimum a 45-degree angle, in place every 20-30m). Any potentially harmful chemicals should be appropriately stored, and any exposed pipes should be capped overnight, and when personnel are off site. In the unlikely event a mammal becomes trapped, works should be paused and the ECoW should be contacted for advice as soon as possible. No attempt should be made to catch the animal(s), and all staff should move away from the area to avoid stressing the animal(s) further.

Woodland/Trees/Hedgerows

4.4.7 As detailed previously, to ensure that retained trees/hedgerows/woodlands are not impacted during the construction phase of the works (and the operational phase where appropriate), the requirement for construction exclusion zones/fencing in accordance with BS 5837 will be reviewed and adhered to during works and reviewed regularly.

4.5 Key Responsibilities

4.5.1 The key responsibilities and personnel (where known) are set out in Table 4.3 below, including Project Manager / Site Manager and ECoW.

Table 4.3: Key responsibilities

Name	Responsibility	Role/Comments
The Operator	Project Manager / Site Manager	Day to day responsibility for construction and implementation of construction-related ecological measures
Suitably experienced/licenced Ecologists	ECoW	Day to day responsibility for ecological advice and supervision

4.5.2 An initial pre-commencement meeting will be arranged between the Project Manager/Site Manager and Ecologist/ECoW to discuss the detailed proposals and programme. Any setting out of exclusion areas or fencing, parking, access and storage areas will be agreed prior to construction works commencing. In addition, depending on timings, the need for any update surveys will be reviewed.

4.5.3 Ecological supervision will then be undertaken during the construction works in accordance with this document. The ECoW will maintain regular contact with the Site Manager via telephone and email. The ECoW will be on call to attend site where unscheduled / unexpected ecological issues arise, where possible.

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APPENDIX 9 – ECOLOGICAL UPDATE

APPENDIX 10 – REGULATION 25 UPDATED MITIGATION MEASURES TABLE

Regulation 25 Response – Appendix 10 - Updated Mitigation Summary - December 2025.		
Issue	**Effect**	**Mitigation**
Scope of the assessment.	Existing permitted quarry operations	The existing permitted quarry phases are incorporated within this application to make it easier to permit the proposed extensions and incorporate that which is already permitted into a single permission. This assists the planning authority and the operator as it regulates all mineral extraction activity in a single consolidating permission. The existing quarry operations already have planning permission and require no further assessment other than addressing any cumulative effects. The mitigation measures relating to those working areas are already accepted, thereby setting a baseline, default, onto which the proposed extensions can be added. The mitigation measures set out below therefore, consider only those matters that arise out of the two quarry extensions. This summary addresses only those locations where likely significant effects have been identified. Where effects are not considered to be significant, no targeted mitigation is provided. However, in many such cases, those receptors will benefit from mitigation measures designed to protect receptors that are more significantly affected.

Landscape and visual impact.	Landscape character and features	Mitigation would include reinstating locally characteristic landscape elements which would relate well to the overall existing landscape character of the area. The retained hedgerows would also be enhanced to be species-rich with additional planting of native trees. Where appropriate, margins of up to six meters may be fenced around hedgerows to create an unmanaged, uncut, or unfertilised grassland strip. New areas of woodland and hedgerow would be planted in accordance with species lists approved for the existing quarry. These would use locally appropriate native deciduous species from the NVC Woodland W8 list, sourced locally wherever possible. All species are in keeping with the character of the area. The hedgerows would include the planting of native species with a variety of berry and seed-bearing shrubs New areas of grassland (calcareous/neutral) would be established in accordance with the details approved for the existing quarry.

		Areas of cliffs and rock piles, scree, cracks and hollows would be left to natural regeneration. Over time, this is likely to regenerate into sparse calcareous grassland habitat. Enhancement and extension of existing public rights of way.

	Visual Impact	Establishment and management of 30ha of landscape buffers around the perimeters. Landscape buffers at NW Land would include the creation of new screening landform within the northern standoffs along Stamford Road The retention and management of 3.2km of perimeter hedgerows and 9ha of woodland along the eastern boundary, including Shacklewell Hollow SSSI Phased working of Field 14 into a total extraction area of 36.2ha and management of 4.6ha of landscape buffers around the perimeters. NW Land extension to be worked initially from the south side of the site, then working towards the north-west would retain the central ridge line and help to conceal views from the north for as long as possible. Additional screening along the Stamford Road and hedgerow management to form a thick roadside barrier. formation of bunding, opposite to the residential properties along the road (Shacklewell Lodge, Shacklewell Cottage and Home Close) Field 14 to be worked initially from the north side of the site to retain the higher plateau edge and conceal views from the south for as long as possible.

		Temporary storage mounding along the Empingham Road may offer additional beneficial screening. Additional screening along the Empingham Road. Formation of bunding around the rear of the nearby residential properties (Wytchley House), along the road and along the southern boundary A new access road will be installed below ground level in the NW Land to screen it from view.
Landscape Environmental Management Plan	LEMP	The proposal includes a draft LEMP, which sets out the landscape management proposals that set out how the site will be developed and incorporates various sensitive mitigation strategies proposed, particularly for ecology and landscape features.

Soils and agriculture	Potential loss of best and most versatile soils	Best and most versatile land occurs in small, isolated patches across the two sites. In Field 14, the restoration topography is such that restoration of the land to arable use is not practical due to the steep sides. All soils stripped from Field 14 will be retained, stored and used in the final restoration but it is unlikely that best and most versatile restoration will be achieved in Field 14 due to the changed topography. In NW Land, the same approach is taken to stripping and storing soils, but the final restoration is suitable for arable use and soil resources can be replaced and BMV status can be recreated. The sub best and most versatile areas will return to the same grade agricultural land, with other areas of biodiversity being created to achieve the biodiversity net gain targets. All soils will be handled in accordance with best practice and retained for use in restoration.[1]
Ecology		Environmental elements have been considered during the development of the restoration scheme to avoid and reduce potential impacts on biodiversity. This approach has led to a range of mitigation measures capable of reducing the magnitude of impacts being embedded within the restoration design or captured within the proposed construction practices. Measures specifically

[1] The Institute of Quarrying - Good Practice Guide for Handling Soils in Mineral Workings - https://www.quarrying.org/soils-guidance

Ecology - Field 14	**F14 Habitats**	related to the protection of ecological sites, habitats and protected species are detailed below.
	Woodland Habitats	The loss of woodland will be replaced and further enhanced by increasing the woodland available in Field 14. The creation of new woodland will include species such as small-leaved lime (tilia cordata), sessile oak (Quercus petraea) and silver birch (Betula pendula). All species chosen are in keeping with the character assessment of the area.
	Grassland Habitats	The loss of grassland (arable field margins and IG1) will be mitigated through the creation of large expanses of grassland around the peripheries of Field 14. The restoration proposals also include exposed limestone, which over time is likely to regenerate into calcareous grassland habitat. The grassland will be seeded with a local, native, appropriate seed mix.
	Hedgerows	The restoration scheme includes the plantation of species-rich hedgerows with trees within the centre of Field 14. The retained hedgerows will also be enhanced to species-rich with trees. The created hedgerows will include the planting of native species with a variety of berry and seed-bearing shrubs and will be locally sourced, if possible.

	<u>Priority Species</u> Great Crested Newts	Mitigation for the loss of suitable GCN habitat will include the advanced planting of woodland around the site boundaries (both Field 14 and NW Land) and the phased creation of suitable terrestrial habitat, such as woodland, hedgerows and grassland. This will not only enhance the Field 14 area but will also strengthen connections into the wider landscape, including other waterbodies. Best practice working methods in regard to GCN will be detailed within the Construction Environmental Management Plan (CEMP). It is assumed that specific mitigation related to the GCN licence for the Field 16 application will be applicable in some areas across the site.
	Bats	To mitigate the unavoidable loss of habitat value to roosting, foraging and commuting bats across Field 14, woodland, trees, hedgerows and grassland, in keeping with the character assessment of the area, will be planted as part of the restoration proposals. Best practice working methods regarding bats will be detailed within the CEMP.

	Badgers	Due to the presence of active badger setts within Field 14, a Natural England licence to interfere with a sett will be required, once planning permission has been granted. Detailed mitigation measures will be outlined as part of the licence application. Best practice working methods regarding badgers will be detailed within the CEMP.
	Wintering Birds	There is proposed woodland and hedgerow plantation. Species should be planted that hold winter berries which are a valuable food source for dunnocks, linnets, fieldfare, and redwing. There is also a seasonally grazed slope of grassland, this will provide suitable foraging habitat for linnets. Any retained hedgerows should be managed and ensure a thick base and coppicing or laying method should be used. Introduce small plots of wild bird cover to provide a seed-rich habitat.
	Breeding Birds	For further species-specific mitigation, see Table 14 in ES Ecology Technical Appendix 1.5.

	NW Land Habitats	Nest boxes should be provided within retained hedgerows/trees to mitigate for the loss of on site hedgerows. This will also encourage important species onto Field 14 post-development from within the local area. Tree and hedgerow planting will increase the nesting opportunities within the Field 14 area due to the overall net increase in this habitat type. It is recommended that the proposed grassland is seasonally grazed to provide a suitable nesting habitat for farmland birds by managing the grassland sward height. It is recommended that within the woodland habitat, a thick understory is established quickly, and any deadwood should be left in situ to allow ground-dwelling invertebrates to thrive, providing a good food source for song thrush and other woodland species. Any woodland habitat management should be avoided between March and August. For further species-specific mitigation, see Table 14 in ES Ecology Technical Appendix 1.6.

Ecology – NW Land	Woodland (including deciduous woodland and broad-leaved semi-natural woodland)	The loss of woodland will be replaced and further enhanced by increasing the woodland available on site. The creation of new woodland will include species such as small-leaved lime, sessile oak, rowan, gorse, bramble and silver birch. All species chosen are in keeping with the character assessment of the area.
	Grassland Habitats	The loss of grassland (arable field margins and improved grassland) will be mitigated through the creation of grassland around the peripheries of NW Land. The grassland will be seeded with a local, native, appropriate seed mix.
	Hedgerows	The restoration scheme includes the plantation of species-rich hedgerows with trees within the centre of NW Land. The retained hedgerows will also be enhanced to species-rich with trees. The created hedgerows will include the planting of native species with a variety of berry and seed-bearing shrubs and will be locally sourced, if possible.
	NW Land Priority Species	

	Bats	To mitigate the unavoidable loss of habitat value to roosting, foraging and commuting bats across the NW Land, woodland, trees, hedgerows and grassland, in keeping with the character assessment of the area, will be planted as part of the restoration proposals.
	Badgers	Due to the presence of active badger setts within NW Land, a Natural England licence to interfere with a sett will be required, once planning permission has been granted. Detailed mitigation measures will be outlined as part of the licence application. Best practice working methods regarding badgers will be detailed within the CEMP.
	Birds	Additionally, hedgerows, woodland, arable field margins, agricultural land, and neutral grassland are proposed across the NW Land area, increasing the amount of suitable habitat and also strengthening connections to the wider landscape. Mitigation for the loss of suitable bird habitat will also include the enhancement of the existing hedgerows within the NW Land area. Any gaps within the hedgerow will be filled with native berry and seed-bearing species. There is proposed open mosaic of habitats, including some conservation grazed grassland, which will hold foraging opportunities. The mitigation should

	Wintering Birds	be applied with planted areas of species that hold winter berries, which are a valuable food source for farmland bird species. Weedy over-wintered stubbles are the most beneficial winter-feeding habitat for skylarks (and other wintering bird species) on agricultural land. It is recommended that within the woodland habitat, a thick understory is established quickly, and any deadwood should be left in-situ to allow ground-dwelling invertebrates to thrive, providing a good food source for song thrush and other woodland species. Any woodland habitat management should be avoided between March and August. For further species-specific mitigation see ES Ecology - Table Technical Appendix 1.5.15
	Breeding Birds	Any retained hedgerows should be managed to ensure a thick base, and coppicing or laying method should also be used. Introduce small arable fodder crops or small plots of wild bird cover to provide a seed-rich habitat. Additionally, where possible margins of up to six meters can be fenced around hedgerows to create an improved grassland that is unmanaged, uncut, or unfertilised. This can be cut on a bi-annual basis after the 31st of August. This will ensure that there are seeds available for the majority of the year.

		Additionally, spray and cultivate as late as possible as this will provide important winter-feeding habitat on cropland (applies for all bunting species). Short-term mitigation could involve the erection of nest-boxes on maintained trees within the eastern woodland belt. It is proposed that any new grassland areas within the landscape buffer should be managed to have a minimum sward height of 60cm to benefit ground nesting bird species. For further species-specific mitigation see ES Ecology Table 15 in Technical Appendix 1.6.
	Invertebrates	Notable invertebrate species that were recorded within the site boundary included grizzled skipper and dingy skipper. All of which are protected under section 41 under the NERC Act 2006 and UK BAP priority species, respectively. The proposed works may require the temporary disturbance to areas of suitable invertebrate habitat (specific flora species are detailed in Table 15). To mitigate the temporary impacts to invertebrates, most notably the species aforementioned, it is recommended that the following measures are adhered to during construction of the pods:

• Retention of sloping grassland areas, woodland and also targeting the retention of the foodplant species mentioned in the further botanical surveys (Table 15).

• Retention of suitable flora species (Table 15) for grizzled skipper and dingy skipper larvae (caterpillar); and

• ECoW in areas of suitable habitat (Table 15) which will be impacted by construction is recommended.

Table 15: Notable invertebrate species recorded within the site boundary and their favourable flora that were noted within the site.

Species	Preferable Habitats	Preferable Flora Found Within Northwest Land
Grizzled skipper	• Woodland (rides and clearings); • Arable field margins	• Bramble (frequent throughout woodland and hedgerows); • Dog rose (frequent throughout hedgerows); • Common birds foot trefoil (within improved grassland area)
Dingy skipper	• Woodland (rides and clearings).	• Common birds foot trefoil (within improved grassland area).

A LEMP has been produced. This will ensure ecologically sensitive practices are used and that the long-term ecological value and condition of the habitat type is met and maintained.

Additional Mitigation	Habitats	To avoid impacts to retained hedgerows and trees, extraction will be undertaken in line with BS5837:"012, "Trees in relation to design, demolition, and construction – recommendations" to avoid damage to Root Protection Areas (RPA) of retained hedgerows and trees.
	Reptiles	To ensure no opportunistic reptiles are harmed during the clearance works, it is recommended that clearance of suitable habitat is undertaken in temperatures above 5°C. If a reptile is noted during the habitat clearance, all works must cease, and the reptiles should be left and allowed to move to safety. The impact avoidance methods will be detailed within the CEMP. In line with planning policy, which requires developments to enhance Field 14 for reptiles, it is recommended that: • Artificial habitat features should be created, including Log and brashpiles; and • Artificial hibernacula. It is recommended that prior to each phase, Potential Roost Feature (PRF) inspection surveys are undertaken on any tree with moderate to high suitability to support roosting bats, which may be impacted by the proposed

	Bats	works. This will involve the use of tree-climbing or access equipment to gain access to PRF's to assess in more detail their likely suitability and to look for evidence of bats. If these PRF are verified as moderate or high suitability for bats, further nocturnal surveys will be necessary to determine the presence/absence of any roosting bats, and the characterisation of any confirmed roosts. If a bat roost is identified within any of the trees to be impacted, a Natural England mitigation licence will need to be obtained. All works and mitigation measures will be followed as detailed within the licence. If tree removal cannot be avoided and the trees were assessed as having low suitability to support roosting bats, it is recommended that these trees are soft felled to minimise any potential impacts to roosting bats. Soft felling involves removing each limb/section of the tree, placing it on the ground and leaving it grounded overnight to allow any opportunistic bats to fly to safety. To ensure that bats continue to use the commuting and foraging features that are to be retained and created in advance of the works, any new lighting used within the scheme should be kept to a minimum and carefully designed in order to prevent light spilling onto important foraging and commuting features. The following key considerations should be adhered to:

		• A 2m dark buffer from any suitable bat habitats should be maintained throughout the works. • LED luminaries should be used, where possible. • A warm white spectrum should be adopted to reduce the blue light component. • All lighting should be cowled and directional to the areas of works only; and • The times during which the lighting is on should be limited to provide some dark periods, particularly during the peak in bat activity (20:00 – 23:00hrs between April and September). Management prescriptions for the protection of badgers during the construction will be detailed within the CEMP at the detailed design stage and will include the provision of ramps within open excavations to avoid badger entrapment and appropriate storage methods for potentially harmful chemicals. Due to the activity of badgers within either extension area it is recommended that a pre-commencement badger survey is undertaken every year. If it is determined that the badger sett remains active or that additional setts are

		discovered, it will be necessary to apply for a licence from Natural England to allow the closure of both the main sett and outlier sett.
	Badgers	Badger sett closure under a licence is constrained by timings and as such, licences are not normally issued during the badger breeding season (November to June, inclusive). To ensure that sufficient information is gathered to apply for a licence from Natural England, it is recommended that an Extended Badger Survey is undertaken, and territorial evidence of clans be determined, through bait marking. This will provide the baseline information required for a licence application and the type of mitigation that will be required.
	Other Mammals	Management prescriptions for the protection of other mammals during the construction will be detailed within the CEMP at the detailed design stage and will include the provision of ramps within open excavations to avoid mammal entrapment and appropriate storage methods for potentially harmful chemicals. To avoid the damage or destruction of nests and/or eggs of wild birds, any clearance of suitable nesting habitat will be undertaken outside the nesting season (March – August, inclusive) or following confirmation of the absence

		of nesting birds by a suitably qualified ecologist. These impact avoidance methods will be detailed within the CEMP.
	Birds	There was no report of invasive plant species within either extension area however, it is important that the proposed development ensures that the site remains as such.
	Invasive Plant Species	New habitat creation will provide opportunities for species confirmed to be present within both extension areas at baseline. In addition to these enhancements which are embedded into the proposed works, a range of additional ecological enhancement measures will be delivered as part of the proposed development, as identified below. Further details will be set out in a Biodiversity Action Plan at the detailed design stage. However, as an indicative guide:
	Additional Habitat Opportunities	• Inclusion of plant species of known wildlife value within the landscaping scheme, including night-scented varieties to benefit bats, and fruit bearing varieties to benefit birds. • Provision of new bat roosting opportunities (i.e., bat boxes). These will be a purpose built, durable and long-lasting variety such as available from 'Schwegler or 'Habitat' or equivalent.

Enhancements		• Provision of new bird nesting opportunities (i.e., nesting boxes). These will be a purpose built, durable and long-lasting variety such as available from 'Schwegler or 'Habibat' or equivalent. • Skylark Plots. Are considered for inclusion within another part of the approved restoration areas / under client owned agricultural land, where suitable. • Beetle Banks. Within fields greater than 0.2 square kilometres to provide nesting cover and over-wintering habitat for beneficial insects. Beetle banks are two-metre grass strips through the middle of arable fields; and • Creation of log piles and/or brash piles to provide hibernacula for reptiles and amphibians
Construction Ecological Management Plan (CEMP)	CEMP	To reflect the various recommendations in the ecology section of the ES, a **Construction Ecological Management Plan (CEMP)** will be employed as part of a planning condition. A draft CEMP submitted – entitled '*draft Construction Ecological Management Plan for the Proposed Extensions to Grange Top Quarry* – October 2025 – prepared by Felstone Consulting. Appendix 8 of the main Regulation 25 Response includes a draft CEMP.
Archaeology	Effects of working on archaeological features	No scheduled or other designated heritage assets or monuments will be affected by the proposals, but a small number of archaeological sites have been identified as a result of the desk-based assessment, geophysics and an extensive trial trenching exercise carried out across the site in 2023. This has

	(Geo) Palaeo-archaeology	identified a number of Iron Age sites which will require recording to an appropriate level but do not appear to have a level of significance that should prevent the development from proceeding. Identified sites will therefore be excavated and properly recorded in accordance with a scheme to be agreed with the County Archaeologist under an appropriate planning condition. Appendix 7 of the regulation 25 Response sets out a written Scheme of investigation for assessing Paleo-archaeology.
Heritage	Effects of working on heritage assets.	One heritage asset occurs within the application area, that being a Grade II listed windmill adjacent to Field 14. The windmill sits outside the proposed development area, but inside the planning application red line. An assessment of heritage assets has shown there to be no unacceptable effects. No setting associations between any assets and the site are considered to be significantly affected and the visual screening proposals will ensure that visual impacts are reduced to acceptable levels. The blasting and ground vibration report sets an appropriate ground vibration limit for the windmill of 15mm PPV.

Highways	Access to and from the site and the local road network	The proposed site access onto the A606 has been designed as a roundabout junction. The existing site access at Pit Lane and Ketco Avenue are simple T junctions onto an A class road and operate well. A T junction onto the A606 was considered but rejected as the A606 tends to have higher traffic speeds and a larger controlled junction arrangement was considered. The visual and noise aspects of the new access road are already set out above. The A606 Stamford Road is a single carriageway road subject to the National Speed Limit in the vicinity of the site. It has a carriageway width of approximately 7.3m and is not street lit. An analysis of recent collision data does not suggest any particular road safety concerns associated with accessing the site from the A606 Stamford Road. The results of the junction capacity assessment show that the proposed site access roundabout operates with spare capacity in 2030 and 2055, inclusive of background traffic growth and with the addition of the proposed development traffic.

		Based on the findings of the report, it is considered that the proposed development would not have a severe impact on the highway network and that the proposals are acceptable from a transportation perspective. Road Safety Audit Stage 1 has been completed. A stage 2 Road safety audit will be undertaken as part of the detailed design should planning permission be granted. Section S38/278 agreements to be entered in to in due course regarding the transfer of the new sections of road that are to become public highway. i.e. the roundabout.
Public Rights of Way	Changes to and provision of new rights of way.	The site is currently crossed by two public rights of way, these being bridleway E226 that runs between the existing quarry and NW Land and footpath E229 which connects Ketton village to bridleway E226 and crosses the existing quarry. The proposals seek to expand and upgrade the local rights of way network through a combination of new routes and upgrades to existing routes. Most of these will occur at an early stage if planning permission is granted. Footpath E226 was constructed to a bridleway standard but Heidelberg does not own the northern and southern ends of it. The Council has previously asked for the path to be upgraded to bridleway status but because of the land

		ownership, this has not been a practical option. Heidelberg therefore proposes opening two new sections of bridleway, in its land ownership, which will create a bridleway that comes off Empingham Road close to the windmill, joins path E229, which will be upgraded to a bridleway. An existing track north of the existing footpath bridge will then be opened up as another section of permissive bridleway to link onto bridleway E226. This will create a bridleway that runs from Ketton Village, round the quarry and comes out at Steadfold Lane (to the east), resulting in a 6km off road bridleway linked directly to the village. These new sections of bridleway will be formally dedicated once the necessary works to convert the route from foot path to bridleway have been completed. Within restored area C3 a new bridleway will be created around the restored land approximately 1km long. This will link to bridleway E226. This will be formally dedicated once the aftercare works on C3 has been completed. In Field 13 (the windmill field), a new footpath will be created around the planted woodland and connecting to Empingham Road opposite the new permissive bridleway mentioned above. This will be formally dedicated once the path has been created. A new permissive path will be created in the landscaped/planted standoff between the proposed NW Land Bund and the A606 at Shacklewell. This path

		will run around the northern and eastern sides of NW Land, to connect with bridleway E226. The path will run outside the operational area and will be appropriately fenced. This path will be opened once the new NW Land bunds are constructed. Two further permissive paths will be created to the north of the A606, either side of Shacklewell Lodge/Farm, to connect the new permissive path mentioned above (parallel to the A606) to the existing rights of way network that link to Empingham. The intention of these two new paths is to create an off-road route between Empingham and Ketton Ketton Parish Council has asked if Heidelberg Materials could also create a mown or stoned path in the northern verge of Empingham Road between Wootton Close and the proposed permissive path in Field 13. This is in the public highway. Heidelberg Materials is willing to do this if the highway authority is in agreement. This will mean pedestrians would not have to walk in the carriageway of Empingham Road to get to the Field 13 path. A further permissive path is proposed inside Field 14 to connect Wytchley Warren Cottages to Field 13. This will connect to the Empingham Road Verge

		Path and permissive bridleway, creating an off-road route between Wytchley Warren Cottages and Ketton Village. A temporary diversion of bridleway E226 will be required whilst a new bridge and crossing point are created along the line of the existing bridleway. The new bridleway bridge and crossing point will be maintained by the applicant as they are integral to the operation of the quarry.
PROW Delivery	Delivery/Upgrade of New Rights of Way (Refer to Table 4 in the Regulation 25 Response document.)	The timing and delivery of the new/upgraded rights of way is set out in Table 4 for the main Regulation 25 Response.
Hydrology and Hydrogeology	Impact on groundwater	Mineral extraction has been undertaken since 1928 at Grange Top Quarry. To maintain continuity of supply, an application is being submitted to permit extraction within two new areas within the Application Area. These are known as NW Land and Field 14. NW Land is located in the northwest of the Application Area, covering 129.7 ha. The area is bounded to the north by the A606 Road, with the River Gwash located 190 m to the north. The eastern boundary is defined by Shacklewell

		Hollow, which is designated as a SSSI and contains a tributary of the River Gwash. The tributary is fed by springs and seepages. Field 14 is located in the southeast of the Application Area and covers 38.7 ha. The River Chater is located 1 km to the southeast. The Lincolnshire Limestones and Northampton Sand are the water bearing strata at the site and are considered to be in hydraulic continuity. The top of the Whitby Mudstone Formation forms the base of the aquifer. The watertable is located close to the boundary between the Limestone and the Sand. Where watercourses have incised down to the Whitby Mudstone, groundwater discharges from the Lincolnshire Limestone and Northampton Sand via seepage faces and springs, support nearby water features. Groundwater abstractions in the area target the Lincolnshire Limestone and Northampton Sand. The Application Area is located within Source Protection Zone 3 (SPZ3) for a public water supply, located 12 km to the east. The extension areas represent a continuation of current site operations and therefore, there is no change from the existing situation of Grange Top Quarry. Mineral extraction will be undertaken entirely above the watertable; therefore, dewatering will not be required. The absence of dewatering considerably reduces the risk of impacting nearby sensitive water features.

		Flow to Shacklewell Hollow from NW Land will be maintained, as the saturated thickness of aquifer beneath the extraction area will not be reduced. No cumulative impacts are anticipated associated with the former and currently permitted mineral extraction. The significance of the impact on the water environment during mineral extraction and 'following the completion of restoration is considered to be 'Minor'.
	Water flow and level	A Planning Condition for Grange Top Quarry requires that monitoring of groundwater elevations is undertaken regularly. The existing, comprehensive monitoring network covers the Application Area and extension areas. This will allow any changes in the groundwater elevation due to the operation of the quarry to be identified, and appropriate assessment to be undertaken.
	Water quality Hydrocarbons	The risk associated with the accidental release of hydrocarbons or other chemicals from mobile plant operating within the quarry void will be mitigated by the spill prevention and response procedures already operating at the site as set out below. (These are summarised in the hydrological assessment - *Appendix 3189/HIA/A3*.)

		i) Refuelling is undertaken by a trained operator, with routine inspections being undertaken. Operators are trained in the spill response procedure. ii) Spill kits are available for use in the unlikely event that a spillage occurs iii) The spill would be isolated to prevent further contamination. If the spillage enters the water management system, any discharge or pumping would be stopped. iv) An emergency spillage response contractor has been appointed to be contacted in the event of any incidents v) All manufacturer's maintained in accordance with best practice and the manufacturer's specification. Where possible, all maintenance will be carried out off-site or on areas of hardstanding.
Flood Risk	Potential for increased risk of flooding in the locality as a result of the quarrying activity.	Flood risks to the site from all sources are considered to be low and are summarised below: Mineral extraction is 'Less Vulnerable' in terms of flood risk, in accordance with the NPPF. Both Extension Areas are located on relatively high ground, away from watercourses and in areas designated as Flood Zone 1 by the EA. The small area of Flood Zones 2 and 3 that encroach onto the site are outside of

		the proposed extraction area. Therefore, development will not impact floodplain storage or alter fluvial flood flow paths. Pluvial flooding is regarded as a very low risk due to any risk being outside the extraction area of NW Land. Incident rainfall will be retained within the quarry void during operation and will be able to infiltrate through the base. A sump will be used where volumes of run-off require it. The risk of groundwater flooding is very low due to the highly fractured nature and good drainage characteristics of the underlying limestone and the proposal to work above the watertable. Flood risk from reservoir failure is very low for most of the Application Area, with any risk being associated with Shacklewell Hollow, which is not part of the working area. The proposed extension is not considered to pose a risk to receptors external to the site through groundwater, pluvial or fluvial flooding during extraction and post-restoration. This is due to the Extension Areas being located outside of designated Flood Zones and the good drainage characteristics of the limestone. It is considered that the proposed development complies with flood risk policy. The area of Grange Top Quarry identified by the Strategic Flood Risk

		Assessments as being within a Flood Zone is outside of the proposed working area and therefore, the Extension Areas would have no impact on fluvial flood risk.
Noise	Impact on noise sensitive properties	The site has very few residential receptors close to it. Where these do exist, screening bunds/landscaping is proposed, and phasing has been designed to provide a barrier attenuation between receptors and noise sources. The same is true of the proposed access road which has been purposefully recessed into the ground to contain road traffic noise. (The landscape section above discusses these mitigation features in more detail.) The noise report proposes limits at dwellings for site noise, based on the guidance contained within the Planning Practice Guidance and having regard to the measured background noise levels at locations taken to be representative of the dwellings selected for this assessment. The calculated site noise levels for routine and temporary operations in the proposed working areas comply with the suggested site noise limits at all the assessment locations with the proposed bunding is in place. The proposed operations conform to the advice set out in the Planning Practice Guidance and it is considered that the site can be worked while keeping noise emissions to within environmentally acceptable limits.

Location	Receptor Sensitivity	Calculated Site Noise Level dB $L_{eq, 1 hour free field}$	Suggested Site Noise Limit (Routine Operations) dB $L_{eq, 1 hour free field}$	Suggested Site Noise Limit (Routine Operations) dB $L_{eq, 1 hour free field}$
			Routine Operations	Temporary Operations
1. Shacklewell Lodge	High	46	55	70
2. Redland Farm	High	34	48	70
2a. Glebe Farm	High	34	48	70
3. 1-9 Stamford Road	High	34	53	70
4. Ketton Village	High	36	48	70
5. Wytchley Road/Bartles Hollow, Ketton	High	38	44	70
5a. Land off Park Road, Ketton (New housing development)	High	39	44	70
6. Quarry Farm Cottages	High	34	46	70
6a. Edith Weston Road, North Luffenham	High	30	46	70
6b. Keepers Cottage, Ketton Road	High	39	46	70
7. Normanton Lodge Farm	High	34	44	70
7a. Wytchley Warren Farm	High	38	43	70

		<table><tr><td>7b. Wytchley Warren</td><td>High</td><td>43</td><td>43</td><td>70</td></tr><tr><td>8. Hawthorn Cottage/Woodside Farm</td><td>High</td><td>43</td><td>45</td><td>70</td></tr></table> For ecological receptors (notably SSSIs at Ketton quarries, Shacklewell Hollow and North Luffenham quarry), stand offs will maintain an acceptable noise environment. The Ketton Quarries SSSI already sits within the active quarry without any obvious unacceptable effect.
Dust	Impact on sensitive properties from fugitive dust. –	Several properties exist around the quarry, all of which can be considered as sensitive receptors for dust and particulate matter. A range of measures set out below will be employed to control dust generation, such as the regular damping of internal haul routes in dry weather and the use of road sweepers as necessary. A dust management plan is submitted as part of the application mitigation proposals. The existing permission (2021/0796/MAF) includes a Dust Minimisation Scheme at Schedule 2. The dust assessment prepared by DustScanAQ includes a dust management plan, which is expected to replace the existing Dust Minimisation Scheme, as it brings dust controls up to a modern standard.

		Dust mitigation measures are set out in sections 3-5 of the Dust Management Plan – October 2025 – DustscanAQ - Section 3 – 5.
	Weather Station	**Mitigation includes: -** • Maintain site weather station and set triggers to identify those weather conditions when there is an increased or high risk of wind-blown dust.
	Maintenance	• Maintenance and proper operation of all plant and equipment, including fixed and mobile dust extraction and suppression equipment.
	Training	• All staff to be trained regarding the dust management plan. • Roles and responsibilities in relation to DMP to be clearly identified.
	Site preparation and restoration	• Minimise working material in dry, windy conditions.

	Mineral Extraction	• Reduce drop heights at transfer points. • Control vehicle speeds. • Suspend operations when wind conditions would be likely to result in visible dust emissions towards offsite receptors.
	On-site and off-site transportation	• Wet minerals down with a water bowser if dry • Control vehicle speeds. • Suspend operations when wind conditions would be likely to result in visible dust emissions towards offsite receptors. • Mobile plant with upward or sideways exhausts should be used. • Vehicles should keep to designated haul routes. • Unmade access roads should be kept in good repair and wetted as required.

	Wind scouring of exposed surfaces and stockpiles.	• Control vehicle speeds. • Install and make use of wheel wash for egressing vehicles. • Deploy a road sweeper on the public highway as necessary, and in the event of any spillage. • Keep stockpiles and storage areas tidy. • Wet down storage areas and yards to prevent dust emissions. • Wet down extracted materials where necessary. • Control vehicle speeds.
	Mineral handling (including conveyors and loadout)	• Wet minerals down with a water bowser if dry. • Control vehicle speeds. • Suspend operations when wind conditions would be likely to result in visible dust emissions towards offsite receptors.

		• Reduce drop heights at transfer points. • Inspect conveyors regularly. • Fit shrouding to transfer points where visible dust emissions may occur. • Fit return belt cleaners on conveyors
	Other	• The use of clean water for dust suppression to avoid re-circulating fine material. • High standards of housekeeping to minimise track-out and wind-blown dust. • The planting and maintenance of healthy perimeter vegetation. • Effective staff training in respect of the causes and prevention of dust.
	Monitoring	• Daily visual monitoring for signs of dust. • Maintain existing dust and air quality monitoring equipment and install new equipment as appropriate (see DMP) for Field 14 and NW Land.

- Maintain records of dust in terms of volume and direction and compare to thresholds.

- Implement monitoring at sensitive properties along A606 and at Wytchley Warren cottages as per table 4.3 of the DMP (see below). Note monitoring points will change dependent on the active phase of working.

Table 4.3: Suggested timeline of dust monitoring locations for each phase

Phase	Active dust monitoring locations
NW Field – Phases 1 - 4	No monitoring required
NW Field – Phase 5	DMP2
NW Field – Phase 6	DMP3
NW Field – Phase 7	DMP3
NW Field – Phase 8	DMP2 and DMP3
NW Field – Phase 9	DMP1 and DMP2
Field 14 – Phase 1	DMP4
Field 14 – Phase 2	DMP4
Field 14 – Phase 3	No monitoring required
Field 14 – Phase 4	DMP6
Field 14 – Phase 5	DMP5

- Particulate monitoring - PM10 and PM2.5 monitoring is proposed at key locations on the site boundary, to alleviate any concerns from local residents and enable real-time alerts to be sent to the site in the case of significant fine particulate matter emissions.

	Emergency response Complaints Inspection and Reporting	• Prepare an emergency response procedure in the event of a major dust emission event. • Maintain a compliant log and actions. • Record dust conditions on a daily basis along with any notifications from monitoring and maintain records for inspection.
Air Quality Assessment	General	No further mitigation is required.
Blasting and Ground vibration	General Blasting Frequency	The blasting and ground vibration assessment (Vibrock) in the ES was undertaken based on monitored blasts at the Site. The report recommends the following blast limits at sensitive properties around the Site. The report also advises on the likely effects of using differing sizes of charge in each blast. Blasting currently takes place approximately once per week and is only used for the limestone extraction. Clay, as taken from Field 14 does not need to be

		blasted, but the underlying limestone does. With the exception of the shallow overburden, NW Land contains only limestone. Field 14 and NW Land will be worked simultaneously but only limited amounts of limestone can be worked as and when the overlying clay has been removed. It is expected that in any year, there is only likely to be 10-12 blasts in Field 14 because of this. However, these blasts are unlikely to be spread equally across the year and are more likely to occur in short campaigns until the limestone face catches up with the overlying clay face, at which point limestone extraction would temporarily cease. Blasting effects around Field 14 are therefore likely to be intermittent. NW Land is expected to continue blasting at the rate of once per week throughout its life.
	Ground Vibration - Inhabited Property	Ground vibration limit is chosen that not only is perfectly safe for the integrity of structures, but also takes into account the human perception effects on adjacent neighbours. As the continuing use of the current site vibration criterion of 6 mms-1 peak particle velocity at a 95% confidence level.

	Ground Vibration - Uninhabited Property (Wytchley Warren Farm)	Wytchley Warren Farm has a noteworthy exception limit when uninhabited, as highlighted in the Planning Application 2021/0796/MAF section 30b. Continuing use of the current site vibration criterion of 50 mms-1 peak particle velocity at a 99.9% confidence level should this property be unoccupied and blasting within this vicinity be deemed necessary.
	Ground Vibration - Windmill	Continued use of the current site vibration criterion of 15 mms-1 peak particle velocity at a 99.9% confidence level for the historic windmill to the west of Ketton village.
	Ground Vibration – Motorised Highways	Continued use of the current site vibration criterion of 50 mms-1 peak particle velocity at a 99.9% confidence level for any highways to be used by motorised vehicles surrounding the NW Land or Field 14 extension areas.
	Ground Vibration – Ketton Gorse Mine	The Ketton Gorse Mine has a historical vibration limit due to sensitive structures and as such the current site vibration criterion of 25 mms-1 peak particle velocity at a 99.9% confidence level.

	Ground Vibration – Anglian Water Pipeline	An Anglian Water pipeline is situated directly to the north of the NW Land and, as discussed in Vibrock's report on the matter, in line with that report, the following vibration criterion are considered appropriate - 25 mms-1 peak particle velocity at a 95% confidence level for any blasting operations within this vicinity. The monitoring point will be on the land's surface at the most accessible point, directly above the pipeline route, the closest point to the blast.
	Air Overpressure	Vibrock advise that past experience of air overpressure measurement leads them to the firm conclusion that it is totally impracticable to set a maximum air overpressure limit, with or without an appropriate percentile of exceedances being allowed, simply because of the significant and unpredictable effect of variable weather conditions. This point is recognised by the DETR publication The Environmental Effects of Production Blasting from Surface Mineral Workings and British Standard 6472-2: 2008. With a sensible ground vibration limitation, the economics of safe and efficient blasting will automatically ensure that air overpressures are kept to reasonable levels.

		Vibrock therefore recommend that, in line with the current best accepted modern practice in the extraction industries that safe and practical measures are adopted that ensure the minimisation of air overpressure generated by blasting at source, considering such factors as initiation technique. The mineral operator should design blasting operations and the programme of blast monitoring at the site should be continued.
	Monitoring and Control Blast Size	Blasts at the site have been calculated using an assumed instantaneous explosive charge weights of up to 77 kg. In practice, the Site currently uses a slightly smaller charge weight than this. It is likely that during the working of Field 14 Phase 5 (which is close to Empingham Road, Wytchley Warren Cottages, Wytchley House and the Windmill), a reduced charge size will be necessary. The Vibrock assessment report in the ES includes Table 3.1-3.6 sets out the maximum instantaneous charge weights to comply with the proposed blasting limits. In some cases, blast limits between sensitive receptors overlap, so for development control purposes, it is better to define blasting limits for types of sensitive properties rather than trying to specify the size of charge for each blast.

		For the avoidance of doubt, where overlaps of sensitive receptors occur, the lesser ground vibration limit will apply.
Soils and agriculture	Soil Stripping and Storage	Stripping should only take place in the drier parts of the year (between May and October) and avoided during or just after heavy rainfall. Soil handling will be undertaken when soils are sufficiently dry to be friable. Soil resources should be stored separately in low bunds (no more than 3 m high for topsoil). Topsoil should be stripped from areas designated for storing subsoil. The bunds should be constructed either by excavator or bulldozer (Sheets 2 and 14 in the MAFF Good Practice Guide), avoiding over- compaction. They should be sown with grass to help maintain biological activity and prevent water erosion. The soils should be removed from storage (Sheet 3 in the MAFF Good Practice Guide) and replaced by an excavator during the summer using the loose tipping technique (Sheet 4 in MAFF Good Practice Guide), which avoids traffic on the restored surfaces.

	Restoration Proposals	The proposed restoration comprises quarry floor areas being restored to arable and pasture land, with natural regeneration on quarry slopes. The main requirements to ensure land restoration to similar agricultural quality (subgrade 3b) are: A) sufficient depth of soil to allow cultivations and B) adequate drainage to prevent wetness limitations Restoration of topsoils to a minimum depth of c. 300 mm (TS1 or TS2) would ensure land is capable of cultivation, and effectively reuse all of the topsoils on site. Soil moisture supply (and crop yields) would be increased if permeable/rootable material can be placed below the topsoil, ideally to a thickness of 900 mm, although 300 mm of material may be sufficient. This material could include excess subsoil (SS1) and quarry fines/overburden material. Clay subsoil (SS2) will be reused in restoration on peripheral and non-agricultural areas, to avoid water logging in restored farmland.