# 15. IMPLICATIONS OF 'NO DEVELOPMENT' SCENARIO

## 15.1 Introduction

15.1.1 Schedule 4 (5) of the 2017 Regulations states that an Environmental Statement must contain "an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge."

## 15.2 Current Environmental Baseline at Hamble Airfield

15.2.1 The ecological baseline has been described in Section 10.4 of Chapter 10. It states that the site is an expanse of regenerated grassland and scrub, together with remnant boundary hedgerows and minor stands of regenerating broadleaved woodland. Grazing by deer and rabbits maintain some of the vegetation present, along with periodic management by landowners.

15.2.2 The habitats on-site include semi-improved grassland which largely comprise rank and overgrown swards and coarse grasses, as well as some acid grassland. There is also a large amount of scrub on site, along with native hedgerows which have a number of gaps.

15.2.3 The site also contains broadleaved woodland, generally at a young stage of growth with semi-mature oak and silver birch, with some sycamore, ash and goat willow. The understorey consists of field maple, hazel, hawthorn, blackthorn, with saplings of oak, sycamore and silver birch. The field layers were species poor and dominated by ivy, bramble and bracken. There are also scattered trees again comprising the above species as well as elm, cherry, bird cherry, whitebeam and rowan.

## 15.3 Evolution of site through natural changes

15.3.1 If the site was not worked, it is likely that the environmental baseline would not significantly change, even in the long term. The existing habitats would continue to develop, and the site would largely contain grassland and scrub as existing. Occasionally, species other than those listed above may start to grow on the site if they have arrived by foot, by animal or bird, or by wind. The vegetation would be kept in check by wild grazing from deer and rabbits and would still be managed by the site owners. If the site was completely unmanaged, eventually grassland may give way to pioneer tree species and eventually, over a very long period of time the site may contain largely woodland.

15.3.2 The scheme proposes planting of new species rich native hedgerow, enhancement of existing stands of woodland, and enhancement of the site for reptiles in terms of species and hibernacula. The restoration scheme proposes a significant gain in native hedgerow of over 1.7km, with the existing gaps filled; as well as enhancement of the woodland and semi-improved grassland; and creation of around 43 ha of acid grassland, 6.5ha of native scrub, 2.9 ha of woodland, as well as scattered trees and wetland habitat. This will result in a measurable biodiversity net gain overall. As such, without implementation of the development and ongoing site management, the biodiversity value of the site would likely end up as significantly less than proposed.

## 15.4 Other consequences of no development

15.4.1 If the site was not worked for minerals, it could lead to other built development being built on the site (although it is currently safeguarded through planning policies for prior mineral development). If this were the case it would sterilise the minerals and it would be unlikely that they could ever be recovered. This would put pressure on other areas and other sites to fulfil the current need for minerals in Hampshire and would be likely to lead to importation via HGV from further afield, which is less sustainable overall.

## 15.5 Conclusion

15.5.1 It is concluded therefore that should the development not go ahead, the natural baseline of the site would continue to evolve with similar species as are currently there. The vegetation would likely be kept in check by some animal grazing and site management. Over time, if the site was completely unmanaged, eventually grassland may give way to pioneer tree species and eventually, over a very long period of time the site may contain largely woodland. If the site was not worked, it is likely that the biodiversity value of the site would be less than is proposed through the restoration of the site. If mineral extraction did not go ahead it is also possible that other development eventually would, and this would sterilise the mineral resulting in it having to be imported from further afield.

# 16. HUMAN HEALTH

## 16.1 Introduction

16.1.1 Paragraph 4 (2) of the 2017 Regulations states that an Environmental Statement must "identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on factors including population and human health."

16.1.2 Schedule 4 of the 2017 Regulations goes on to set out the information for inclusion in Environmental Statements. Paragraph 5 requires:

*"A description of the likely significant effects of the development on the environment resulting from, inter alia:*
*(d) the risks to human health, cultural heritage or the environment (for example due to accidents and disasters)*

## 16.2 Scope of Assessment

16.2.1 EIA must be accessible, proportional and robust. This assessment considers the reasonably foreseeable potential impacts of the proposal on human health. Effects on human health can be caused by a number of 'pathways' such as water contamination, dust, noise etc. This assessment therefore draws on the conclusions contained within the following assessments:

- Hydrology and Flood Risk (Chapter 8)
- Noise (Chapter 7)
- Dust & Air Quality (Chapter 12)
- Transport (Chapter 13)
- Landscape and Visual Impacts (Chapter 9)

16.2.2 The impact of the proposal in terms of potential accidents is considered in Chapter 17 below.

## 16.3 Description of Proposal

16.3.1 The Proposal involves the use of established technologies and techniques with regards to materials handling, extraction, processing, stockpiling, tipping and transportation. Full details of the Proposal are set out in Chapter 2 of this ES and as such there is no requirement to expand on these for the purposes of this study.

## 16.4 Methodology

16.4.1 This assessment draws on the findings and conclusions of Chapters 6, 7, 8, 12 & 13 of this ES, in order to identify any potentially significant effects of the proposal on human health.

16.4.2 A Human Health Assessment was asked for by Hampshire County Council in August 2023 as part of the in response to residents' comments. This is appended to this EIA as Appendix 10.1.

## 16.5 Mitigation Measures

16.5.1 Mitigation measures relating to those factors under which human health effects might occur have been addressed within the chapters as set out above. These include:

- Bunds around the outside of the quarry for noise, visual and air quality mitigation, which will be seeded upon completion
- Limiting of infilling movements until extraction is complete
- Post-restoration surface water drainage strategy
- Recycling of water on site resulting in a reduction of groundwater discharge from the site
- Groundwater level and quality monitoring during operational, restoration and aftercare periods

- Good site management practices including no fuelling at the excavation face and keeping fuels in bunded tanks with spill kits on site
- Infilling with imported restoration materials to be carried out under strict controls with regards to types of materials and may require a clay geological barrier. Infilling to be undertaken in line with the Environmental Permit.
- Dust Management Plan (DMP) has now been submitted for implementation at the site;
- Won minerals will be transported to the processing area using a field conveyor;
- The processing area and stockpiles will be located more than 100m from any dust sensitive receptors;
- The screening and washing of minerals being a wet process, that would minimise dust emissions;
- Drop heights will be minimised;
- Water suppression will be used as necessary for dust suppression;
- Duration and timing of dust generating activities will be restricted when undertaken within 100m of dust sensitive receptors during dry/windy conditions, when operationally possible;
- On-site vehicle speeds will be kept below 10mph; and
- All HGVs would be covered prior to leaving the site and would use a wheelwash and travel over more than 50m of clean, hard surface before joining the public highway.
- Further boundary advance hedgerow and tree planting.
- Retention, management, and supplementation of boundary vegetation.
- The design of the processing plant, minimising its height.

- A phased scheme of working and restoration to reduce areas open at any one time.
- The design of the final restoration scheme to reinstate pastoral agriculture, and create new woodland, landscape, and conservation features in accordance with the principles set out in the Minerals Local Plan, and the Landscape Character Guidelines.
- Improvements to the condition of the existing Public Rights of Way Network.
- Provision of an additional length of permissive footpath as a safer alternative route to pedestrian use of part of the Satchell Lane public highway

## 16.6 Assessment of Potential Effects

### Hydrology and Flood Risk (Chapter 8)

16.6.1 The site area extends to around 60ha and it is located on an elevated area of land between Southampton Water and the River Hamble. Ground elevations at the site range from 23.9mAOD to 13.3mAOD, with a topographical divide running approximately north-south through the centre. Surface water run-off from the site flows down topographical gradients to the eastern, western and southern margins of the site, towards the River Hamble, Southampton Water and other minor surface water courses.

16.6.2 The geology at the site comprises the Selsey Sand Formation (SSF), Marsh Farm Formation (MFF) and Earnley Sand Formation (ESF), These are underlain by clays from the Wittering Formation, and all the formations are within the Bracklesham Group.

16.6.3 The superficial sand and gravel deposits comprise the River Terrace Deposits (3rd Terrace), which consists of brown, sandy gravel with clay lenses and

localised areas where clay dominates. Groundwater is around 3-5m below the surface across most of the site.

16.6.4 The standard average annual rainfall at the site is 767mm. Both Southampton Water and the River Hamble are tidal watercourses, with a tidal range of 2.5mAOD - -2mAOD. The highest level on record is 2.8mAOD which is significantly below the ground level of the site as set out in 15.5.1 above. The site is located in Flood Zone 1, which has the lowest risk of flooding from rivers or the sea.

16.6.5 Surface water flooding is usually associated with intense rainfall events, but may also occur when rain falls on land that is already saturated or has a low permeability. Rainfall that is unable to infiltrate into the ground generates overland flow which can lead to flooding or ponding in localised topographic depressions, before the run-off is able to enter the drainage system or watercourse. The risk of surface water flooding for this site is demonstrated to be low.

16.6.6 Groundwater flooding occurs when the water table rises above the ground surface or into man-made ground. Groundwater flood risk at the site is also considered to be low, given the depth of the groundwater below the surface. Operations at the site may be undertaken partly below the water table, however water will be removed at the face and retained within the site, with no pumping of water off-site. Health and safety measures will be designed for the operational site, for working below the water table and working near water (such as barriers, signage and site induction material) to mitigate the risk posted by open water bodies or from flooding by returning groundwater.

16.6.7 The site is not at risk of flooding as a result of reservoir failure and there is no known history of flooding at the site.

16.6.8 Once the site is operational, run-off will be directed to new lagoons in the northern part of the site (Phase 1), and as extraction occurs around the site in phases, then the run-off will be directed to the active quarry void. Once run-off

enters the void or lagoon, it will infiltrate to the sand and gravel aquifer below the Site. Surface water running off-site is expected to decrease during the operational period of the site, given the large quarry voids and lagoons which will collect the water on the site instead. Upon site restoration, drainage features have been created in the naturally lower areas of the site where surface water can drain to, and infiltration trenches will be installed around the periphery of the site to intercept and infiltrate run-off from the remaining catchment areas to prevent any increase in off-site run-off that could arise from using less permeable fill material.

16.6.9 In terms of flooding therefore, there will be a decreased likelihood of surface water flooding during the operational phase, due to the large voids created within the site, and upon restoration, drainage features will be created within and on the periphery of the site to manage surface water. There will be no risk to human health therefore from flooding.

16.6.10 In terms of potential impacts from spills on site, which could get into groundwater, there is relatively little groundwater and as such any fuel or oil leaks from machinery operating at the excavation face can be easily observed and cleaned up. No fuel will be stored in the excavation area and no fuelling activities carried out in this area. The site drainage system will be inspected on a regular basis to ensure that there is no visible oil present and no reported incidents of spills. Fuel storage tanks in the plant site will be bunded in line with good management practice and spill kits will be kept on site to quickly clear up any spillages.

16.6.11 There is the potential for contaminants present in the restoration materials to leach into groundwater. However, only inert restoration materials will be accepted to the Site and the Applicant will apply strict acceptance procedures to ensure that contaminated material is not accepted. There would be a suitably qualified person onsite to deal with the imported materials and information on the source of the material would be collected prior to it arriving within the site. Loads would be visually checked upon arrival and a quarantine area within the

plant site for any further checking to be carried out. Restoration materials not suitable for the site would be taken off-site by the importer. Restoration via imported materials would be undertaken via an Environmental Permit and additional controls such as a geological barrier / attenuation layer may be required to further protect groundwater.

16.6.12 Groundwater level and quality at the site will be monitored at the site perimeter wells throughout the operational lifetime of the quarry and for at least five years afterwards.

16.6.13 Given the above conclusions, subject to the implementation of the mitigation measures proposed, the proposal is not likely to have any significant adverse effects on ground or surface water, and would not lead to an increase in flood risk. Therefore no adverse effects on human health are considered likely through this pathway.

**Noise (Chapter 7)**

16.6.14 Mineral extraction and infilling has the potential to generate noise levels which could adversely affect the amenity of nearby residential properties and other noise sensitive locations. As a result, a Noise Assessment has been undertaken and the impact of the proposals on the noise climate is set out within Chapter 7 of this ES.

16.6.15 The Noise Assessment selected six locations very close to the site to carry out noise monitoring, which are as follows:

- Astral Gardens/Tutor Close
- The Close, Satchell Lane
- Properties on Satchell Lane
- Wessex Manor
- Hamble School
- Properties on Hamble Lane

16.6.16 The noise assessment measured background noise levels at these properties on three separate dates and times with four measurements taken at each location. These were taken at times when background traffic levels were likely to be at their lowest.

16.6.17 The Planning Practice Guidance for Minerals sets out the appropriate noise levels for residential properties during mineral working, which can be no more than 10dB(A) above the baseline level for routine operations. There is a higher noise limit for temporary operations (such as bund creation) which can only happen for a certain number of weeks each year. Once the bunds are in place, these will help in mitigating the noise from the site. The bunds will be put in place prior to the start of mineral extraction.

16.6.18 The noise assessment uses a reasonable worst-case scenario for its calculations, which is the items of plant being assumed to operate and the closest practical position of the proposed simultaneous extraction/infilling areas to each dwelling. It has also been assumed that the plant items work 100% of each hour and the tipping 20% of each hour. Sound power levels for each item have been used based on manufacturer's data, and the contribution from each specific noise source evaluated separately then combined together to give the overall noise level. Soil and overburden stripping, site maintenance, road construction and bund formation and removal are considered as temporary operations.

16.6.19 The Noise Assessment shows that for all of the six noise locations set out above, the noise level would be lower than the appropriate limit for routine operations (background plus 10dB(A)), and as such it would result in a good standard of amenity for the occupiers of residential properties and the school. It also shows that the calculated noise level for the temporary operations would also be well within the higher allowed noise limit for temporary operations.

16.6.20 The proposed mitigation measures in the form of bunds will be maintained for the duration of the quarry working and infilling. It is likely that planning

conditions, should permission be granted, would also control the noise environment and these could include setting the maximum noise limits at surrounding sensitive receptors, a noise monitoring scheme, the use of silencers and white noise reversing alarms, and maintenance of plant in accordance with the manufacturer's specification.

16.6.21 The noise limits are therefore well within the recommended national guidelines for these types of operations, and the mitigation proposed will control the noise environment to protect local amenity. It is therefore concluded that noise levels attributable to the proposal would not lead to an adverse impacts on local amenity and therefore would not lead to any adverse health impacts.

**Dust & Air Quality (Chapter 12)**

16.6.22 Air pollutants at high concentrations can give rise to adverse impacts to the health of humans and ecosystems. Mineral sites can potentially give rise to dust and air quality impacts arising from dust generating activities on site (e.g. sand and gravel extraction, stockpiling of sand and gravel, creation of bunds with soil) and from additional HGV and other vehicle movements.

16.6.23 Medical studies have consistently failed to find any link between dust arising from mineral working and public health. Studies undertaken at mineral extraction sites indicate that particles with a mean hydraulic diameter greater than 30µm will usually be deposited within 100m of its source. Moderate sized particles within the range of 10µm to 30µm may travel 250m to 500m from their source, whilst smaller sized particles that are less than 10µm may be carried up to 1km from source.

16.6.24 The European Union's Directive on ambient air quality and cleaner air for Europe (European Parliament, Council of the European Union, 2008) set legally binding limit values for $NO_2$, $PM_{10}$ and $PM_{2.5}$. The Air Quality Standards Regulations 2010 (The Stationary Office, 2010) implement the EU Directive limit values in English legislation. Achievement of the limit values is a national obligation rather than a local one.

16.6.25 The objectives for $NO_2$ and $PM_{10}$, as prescribed by the Air Quality (England) Regulations 2000 and the Air Quality (England) (Amendment) Regulations 2002 (The Stationary Office, 2000; The Stationary Office, 2002), are shown in the table below:

| Pollutant | Concentration Measured As | Objective |
|---|---|---|
| $NO_2$ | 1-hour Mean | 200 µg/m$^3$ not to be exceeded more than 18 times a year |
| | Annual Mean | 40 µg/m$^3$ |
| $PM_{10}$ | 24-hour Mean | 50 µg/m$^3$ not to be exceeded more than 35 times a year |
| | Annual Mean | 40 µg/m$^3$ |
| $PM_{2.5}$ | Annual Mean | 25 µg/m$^3$ |

16.6.26 The $PM_{2.5}$ objective is shown above, however, although local authorities are expected to work towards reducing $PM_{2.5}$ concentrations, there is no obligation for local authorities to try to meet the $PM_{2.5}$ objective, and it is not included in the Regulations. The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective.

16.6.27 Eastleigh Borough Council has declared four Air Quality Management Areas (AQMAs) in the borough for exceedances of the annual mean $NO_2$ objective, and part of Hamble Lane, close to the Windhover Roundabout, has been designated for this reason. No AQMAs have been designated for $PM_{10}$ and as such it is unlikely there are any exceedances of $PM_{10}$ in the borough.

16.6.28 Chapter 12 of the ES sets out the embedded mitigation measures which will be used on site. These include screening by bunding and vegetation, sheeted vehicles, use of conveyor rather than dumpers, removal of dust from access

road and haul routes, water for suppression of dust as necessary, low speed limits on site, avoiding windy periods for dust generating activities, material stockpiles being kept at a distance from residential properties, and a Dust Management Plan.

16.6.29 The Air Quality assessment uses nine receptor locations within 200m from the working area to assess dust emissions; one of which is ancient woodland but the remaining eight are residential properties, a school and commercial properties. The likely dust ($PM_{10}$) deposition at these properties has been assessed as negligible, taking into account wind frequency and direction, intervening screening and dust mitigation measures.

16.6.30 In terms of emissions from vehicle movements, receptors for assessment purposes have been identified at locations where members of the public are likely to be regularly present over the averaging period of the objectives. The receptors have been located on the façades of properties closest to the road sources, paying particular attention to those located close to junctions, where traffic may become congested, and there is a combined effect from several road links. The receptors are shown in the table below:

| Receptor | Location | x | y | Z (m) |
|---|---|---|---|---|
| R1 | 108 Hamble Lane | 447429.3 | 107835.4 | 1.5 |
| R2 | Rosegarth | 447360.8 | 108468.0 | 1.5 |
| R3 | Threeways | 447370.7 | 108700.4 | 1.5 |
| R4 | Melisande | 447370.7 | 108726.7 | 1.5 |
| R5 | Pasadera | 447379.4 | 108761.2 | 1.5 |
| R6 | Broxmoor | 447689.8 | 110206.8 | 1.5 |
| R7 | 1 Claremont Cottages | 447671.1 | 110220.3 | 1.5 |
| R8 | 6 St George Close | 447752.7 | 110445.7 | 1.5 |
| R9 | 43 Bowers Drive | 447762.5 | 110675.3 | 1.5 |
| R10 | 9 Jacobs Close | 447773.4 | 110716.4 | 1.5 |

16.6.31 All of these receptors are located on or very close to Hamble Lane, with R1 being immediately south of the proposed access and the remaining receptors north of

the access where HGVs will be routed from the site, with R10 being the furthest north.

16.6.32 The predicted impacts of $NO_2$, $PM_{10}$ and $PM_{2.5}$ at these receptors has been assessed, with or without the development. The predicted annual mean concentrations for $NO_2$, $PM_{10}$ and $PM_{2.5}$ in 2023, both with and without the development are well below the Air Quality Assessment Level (AQAL) and have been assessed as negligible at all receptors.

16.6.33 Given the above information, it is clear that the impact of the proposal in terms of air quality emissions will be negligible, and as such no adverse impact on human health is likely to result as a result of impacts on air quality.

**Transport (Chapter 13)**

16.6.34 According to the World Health Organisation report 'Health Effects and Risks of Transport Systems: the HEARTS Project' (World Health Organisation, 2006), road traffic is a major cause of adverse health effects – ranking with smoking and diet as one of the most important determinants of health in Europe.

16.6.35 Traffic-related air pollution, noise, crashes and social effects combine to generate a wide range of negative health consequences, including increased mortality, cardiovascular, respiratory and stress-related diseases, cancer and physical injury. These affect not only transport users but also the population at large, with particular impact on vulnerable groups such as children and elderly people, cyclists and pedestrians.

16.6.36 Potential health pathways associated with the continued operation of the site include increased risk of road traffic accident and injury, and exposure to vehicle exhaust and noise emissions. The impact of vehicle emissions is set out above.

16.6.37 Chapter 13 has updated the personal injury accident history data within the vicinity of the site, which has been included at Appendix 7.2. This recorded 65 injury accident events within the study area, which comprises the extent of Hamble Lane to Windhover Roundabout to the north and Kings Avenue to the

south, over the five-year period (January 2016-December 2020). Of these incidents, twelve were recorded as serious and 53 were slight. None were fatal.

16.6.38 Detailed review of the accident data illustrates that 16 of these accidents were reasonably close to the proposed site access, mostly at junctions, however none included any large vehicles. The accident data does not record any existing highway defects or safety issues that would be exacerbated by the proposed development.

16.6.39 Chapter 10 has also considered environmental impacts associated with the proposed traffic movements from the site. This considered the impacts of severance, driver delay, pedestrian delay, pedestrian amenity, accidents and safety, hazardous loads and dirt on the highway. The impacts are considered to be negligible as a result of the development.

16.6.40 It is also suggested that vehicles are prevented from exiting the site during peak hours for pedestrians (i.e. school start and finish times) as set out in Appendix 7.4.

16.6.41 It is concluded therefore that the proposal will have a negligible adverse effect in terms of its impact from transport, and as such no harm to human health would arise as a result.

**Visual Impacts (Chapter 9)**

16.6.42 The visible landscape is believed to affect humans in many ways including impacts on health and well-being. A number of studies have linked health and well-being effects to exposure to visual landscapes. Generally, natural rather than urban landscapes have a stronger positive health effect, and such effects can include short term recovery from stress or mental fatigue, faster physical recovery from illness and long-term overall improvement on health and wellbeing.

16.6.43 Chapter 9 of the ES assesses the visual and landscape impacts as a result of the development, and has analysed the potential effects on the landscape and

visual amenity associated with the proposal's design and operation. The Assessment Methodology from the Guidelines for Landscape and Visual Impact Assessment from The Landscape Institute were used in the assessment.

16.6.44 A number of receptors around the site have been assessed in terms of the impact on visual amenity. These include properties adjacent to the site in Hamble Lane, Satchell Lane, Tutor Close and Astral Close; the two schools and public rights of way.

16.6.45 Embedded and Additional Mitigation measures are proposed to minimise the landscape and visual impacts of the proposed development during both the preparation and operational phases of the scheme. These include:

- Further boundary advance hedgerow and tree planting.
- Retention, management, and supplementation of boundary vegetation.
- The design of the processing plant, minimising its height.
- Provision of grassed soil screen mounds for acoustic and visual screening.
- A phased scheme of working and restoration to reduce areas open at any one time.
- The design of the final restoration scheme to reinstate pastoral agriculture, and create new woodland, landscape, and conservation features in accordance with the principles set out in the Minerals Local Plan, and the Landscape Character Guidelines.
- Improvements to the condition of the existing Public Rights of Way Network.
- Provision of an additional length of permissive footpath as a safer alternative route to pedestrian use of part of the Satchell Lane public highway
- The movement of the access slightly further south, out of the RPA of T8

16.6.46 Once all the mitigation measures as above are considered, the residual visual impacts upon surrounding receptors have been assessed to be of minor

significance. The site restoration in the long term will result in a minor beneficial landscape impacts. The proposal will result in the creation of a permissive path at the start of the development, which will provide an area for recreation and encourage walking short distances, beneficial to human health. Site restoration will result in an area of public open space, which again is likely to encourage local exercisers and dog walkers.

16.6.47 It is therefore considered that, given that almost all the impacts during the operational phase are minor with the proposed mitigation, that the proposal will not have any significant impacts on human health. Upon restoration, there will be a slight beneficial impact to landscape and visual amenity and as such will correlate to positive health effects.

## 16.7 Summary and Conclusion

16.7.1 The ES assesses the potential impact of the proposal in relation to the water environment, noise, air quality, transport, and visual impacts. These potential pathways to impacts on human health have been considered within this assessment and, drawing on the conclusions of Chapters 7 to 9, and Chapters 12 and 13, no significant adverse effects to human health have been identified as a result of the proposals. This is in line with the conclusions of the separate assessment by TetraTech, at Appendix 10.1.

# 17. VULNERABILITY TO ACCIDENTS & DISASTER

The following Technical Appendices to this chapter can be found at Appendix 8 to this document:

Appendices

Appendix 8.1 - Esso Pipeline location

Appendix 8.2 – Exolum Pipeline location

Appendix 8.3 – Gas Pipeline location

Appendix 8.4 - Unexploded Ordnance Risk Assessment

## 17.1 Introduction

17.1.1 Paragraph 4 (4) of the 2017 Regulations states that "significant effects to be identified, described and assessed under paragraph (2) include the expected significant effects arising from the vulnerability of the proposed development to major accidents or disasters that are relevant to that development."

17.1.2 Schedule 4 (8) of the 2017 Regulations also states that the following needs to be included within Environmental Statements:

*"A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/ or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU(90) of the European Parliament and of the Council or Council Directive 2009/71/Euratom(91) or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies."*

## 17.2 Defining of Disaster and Accident

17.2.1 A Disaster is a hazard which has potential to incur community losses, encompassing assets, life, health and livelihoods, giving significance to disaster events at a personal and local scale. Disaster risk can also be defined as hazards which could cause a locality to require assistance from an outside state which could relate to international aid, or a local authority requiring assistance from another local authority.

17.2.2 Typically, disaster events refer to natural occurrences and are not defined to include events caused by humans. This gives reason to the inclusion of both terms 'accident' and 'disaster' within the Directive to ensure there is certainty

that both man-made and naturally caused events are considered within the EIA process

17.2.3 There is a wide variety of disasters which could occur, including;

- Fire;
- Flood;
- Earthquakes;
- Severe weather – rainfall, heavy snow, heat wave, high winds, lightning & drought;
- Landslides.

17.2.4 Accidents tend to be 'man-made' disaster risks, which can be either non-malicious or malicious, including;

- Industrial Accidents;
- Nuclear Accidents;
- Major Transport Accidents;
- Loss of critical infrastructure;
- Cyber-attacks;
- Terrorist attacks.

## 17.3 Probability of a Major Accident or Disaster

17.3.1 EIA requires the probability of potential impacts to be considered. Where the probability of an environmental impact is unlikely, having regard to the nature, scale and location of the proposed development, further assessment can be scoped out. Where the probability of an impact is likely, the EIA should assess the likely significance of the potential impact.

17.3.2 Having regard to the nature, scale and location of the Application Site, and its vulnerability to the accidents and disasters identified above, all of the potential

accidents and disasters can be immediately scoped out due to the low probability of these events occurring, with the exception of the following:

- Fire
- Flood
- Severe weather conditions including rainfall, high winds, heavy snow & freezing temperatures.
- Industrial accidents

## 17.4 Vulnerability of the Proposal to Major Accidents and/or Disasters

### Fire

17.4.1 The location of the proposed quarry is within a semi-rural area, and the site borders residential properties, small areas of woodland, open land with hedgerows and trees along the boundaries, a railway line to the north with a school beyond, and an area of public open space to the south. The areas of woodland are not close to the plant site, which is the only area of the site which would be storing flammable materials, i.e. fuel for vehicles, however this would be stored in a bunded and sealed area. The likelihood of woodland fires directly adjacent to the site causing an accident or disaster scenario at the Application Site is considered therefore to be negligible and there is no evidence that the small patches of woodland surrounding the site have been subject to large fires in the past.

17.4.2 None of the operations proposed on site involve any burning of materials, and nor do they involve the storage of explosive materials. Safety procedures are however in place to minimise the likelihood of an accidental fire. In the unlikely event of a fire on site, procedures are in place to control and extinguish fire and the presence of fire extinguishers, water bowsers and large quantities of water on site help to reduce the chance of any small fire spreading. The likelihood of

a fire which could lead to a major accident or disaster is therefore considered to be negligible and the procedures put in place at the site to manage the risk of a fire would ensure it would not lead to a significant environmental effect.

**Flood**

17.4.3 Chapter 8 of the ES discusses the water environment and flood risk and Appendix 2.2 to the ES comprises a Flood Risk Assessment.

17.4.4 The Application Site lies within Flood Zone 1 and as such the risk of river and coastal flooding is low. Groundwater flood risk is considered to be low, given the depth of groundwater below the surface and the probability of surface water flooding is also considered to be low risk.

17.4.5 There are residential receptors as well as schools and commercial premises within close proximity to the site. Within the operational phase of the proposal, surface water run-off will be directed to new lagoons created in the northern part of the site at first, and then to the active quarry void during extraction. The run-off rates and volumes are predicted to decline during the operational phase, due to the large voids within the site that will hold water run-off. As such the flood risk to surrounding areas during extraction and infilling is reduced.

17.4.6 Post-restoration, the site has the potential to result in increased run-off, due to the inert restoration material potentially being less permeable than the existing sand and gravel. However, to manage this a drainage strategy is proposed which includes small drainage ponds within the site and infiltration trenches around the outside.

17.4.7 It is therefore concluded that, with the proposed mitigation upon restoration, the Proposal would not lead to significant environmental effects from flooding which could cause or be adversely affected by a major accident or disaster.

**Rainfall**

17.4.8 The standard average annual rainfall for the site is 767mm, which is below average for the UK. Rainfall experienced at the site is unlikely to lead directly to

significant environmental effects through a major accident or disaster. Resultant flooding is considered above.

**High Winds**

17.4.9 High winds have the potential to cause damage to buildings, plant and machinery and in severe cases, can knock down trees and lead to loose debris becoming airborne or being carried outside the Application Site.

17.4.10 The Application Site is likely to experience high winds from time to time. A dust and air quality assessment is contained within Chapter 12 of this ES, which considers the wind direction and frequency and impact on quarry operations, along with appropriate mitigation measures to reduce the risk of the proposal impacting on surrounding receptors as a result of wind. This assessment concludes that the proposal will not have any significant impacts with the mitigation measures proposed.

17.4.11 Very severe winds, which would only be experienced very occasionally, have the potential to cause damage to quarry assets, knock down trees within and adjacent to the site and lead to debris such as tree branches or aggregate stocks becoming airborne. The plant site is located away from the site boundaries such that if any wind damage was caused, it is very likely to affect anyone or anything outside the site.

17.4.12 CEMEX is dedicated to health and safety which is critical to business operations, and effective health and safety management procedures on site further reduces the risk of accidents on site due to high winds. It is therefore concluded that the Proposal would not lead to significant environmental effects from high winds which could cause a major accident or disaster.

**Heavy Snow & freezing temperatures**

17.4.13 Snow and freezing temperatures may occur regularly at the Application Site during winter periods. During extreme conditions, due to operational reasons, operations could be postponed. However, heavy snow and freezing

temperatures are very unlikely to result in the Proposal creating a significant environmental impact through a major accident or disaster.

**Industrial Accidents**

17.4.14 It is CEMEX's corporate policy to give the highest priority to preventing incidents and safeguarding the health and safety of the workforce, and being fully committed to carrying out business operations in a safe and efficient manner, as well as caring for the wellbeing of all those on CEMEX sites and others who may be impacted by CEMEX's activities.

17.4.15 Management at all levels demonstrates visible health and safety leadership, ensuring that health and safety arrangements are clear, implemented and constantly reviewed. There are documented plans in place throughout the various levels of the business that detail health and safety targets, which are formally monitored, to ensure they deliver continuous improvement. Employees receive comprehensive training and development programmes in health and safety competency for their role within the business and CEMEX aims to be at the forefront of industry practice in health and safety. Health and safety controls are put in place at the outset of any new venture in the business, including a new site such as proposed at Hamble.

Pipelines

17.4.16 At Hamble, there are two underground fuel pipelines and a gas main pipeline within or close to the site boundary. These are shown on the Proposed Site Plan, and separately in the approximate locations on Appendices 8.1 – 8.3. The Exolum pipeline runs close to the north-east corner of the site and the far eastern corner, before running along the eastern boundary of the site, adjacent to the rear of existing residential properties. The Esso pipeline runs along the eastern boundary of the site following approximately the site boundary and along a short distance of the southern boundary north of the Pavilion. The Gas Main pipeline runs along the eastern boundary in a similar location.

17.4.17 The scheme has been designed with a significant stand-off between extraction and these pipelines to prevent any issues with pipeline stability or safety. The minimum standoff from the extraction area and the pipeline along the eastern boundary where both pipelines are is 41m, with a 20m standoff to the outer bund. Along the southern boundary, the extraction area would be at least 44m from the pipeline, with a 20m standoff to the outer bund. The gas pipeline also runs along the northern boundary, and again there is a 20m standoff to the bund and 40m to the extraction area. As such the extraction area will be kept at a distance from the pipeline, with no soil bunds placed on top of the pipeline.

17.4.18 CEMEX will work with the pipeline owners prior to commencing any extraction on site to ensure the safety and stability of the existing pipelines during the proposal.

Unexploded Ordnance and Bombs

17.4.19 The site was a former airfield and as such a specialist survey by Safelane Global has been carried out of the site to check for unexploded ordnance (UXO) and unexploded bombs (UXB) below the site surface (see Appendix 8.4). The report explained that Southampton and the wider area sustained a high density of bombing during WWII, due to the extensive port infrastructure and ship building industries, including the Supermarine Works, which occupied the North Airfield of RAF Hamble. As such the site was a strategic bombing target, along with the aircraft manufacturing factory in the South Airfield. It is also possible that its use by aircraft manufacturers would have resulted in explosive ordnance being stored on site, although there is no evidence of waste disposal such as burying UXO.

17.4.20 The survey states that within the footprints of the post-war redevelopment/ground works to comprise the airfield, the risk of shallow buried UXO will have been partially mitigated due to soil stripping and levelling of the site, but there is a risk from deeper buried UXO/UXB. Overall the risk of encountering UXO/UXB is considered to be medium.

17.4.21 The mitigation measures proposed are as follows:

- Site Specific Explosive Ordnance Safety and Awareness Briefings to all personnel conducting intrusive works
- The provision of Unexploded Ordnance Site Safety Instructions
- Explosive Ordnance Disposal Engineer presence on site as required
- Non-Intrusive Magnetometer Survey and Target Investigation to locate buried objects

17.4.22 It is considered that subject to the above actions being undertaken prior to extraction, this minimises as far as possible any risks associated with unexploded bombs and ordnance on the site. The applicant would also adhere to other health and safety legislation in its operation of the site, including the Construction Design and Management Regulations 2015 and the Quarry Regulations 1999. As such the risks in relation to this are already covered by other legislation separate to planning.

## 17.5 Summary and Conclusion

17.5.1 The Proposal is not considered to be highly vulnerable to accidents or disasters as a result of the nature of operations proposed within the Application Site. Whilst there are pipelines on the edges of the site, large stand-offs between the pipelines and the extraction area has been designed into the scheme to mitigate any risk. There is a medium risk of unexploded ordnance/bombs due to the site history, however robust mitigation as set out above will be put in place to deal with the risk.

17.5.2 Therefore, no likely significant effects on the environment have been identified as result of potential accident and disasters affecting the Proposal.

# 18. CLIMATE CHANGE AND SUSTAINABILITY

## 18.1 Introduction

18.1.1 Paragraph 4 (5) of the 2017 Regulations requires that *"a description of the likely significant effects of the development on the environment resulting from, inter alia: (f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change".*

18.1.2 It is also considered necessary to consider the sustainability of the proposal.

## 18.2 Definition of Climate Change, Sustainability and Sustainable Development

18.2.1 Climate change is defined as a change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels.

18.2.2 The definition of sustainable development is *"economic development that is conducted without depletion of natural resources"*, and similarly sustainability is *"the ability to be maintained at a certain rate or level"* and *"avoidance of the depletion of natural resources in order to maintain an ecological balance"*.

## 18.3 Planning Policy

### Climate change

18.3.1 The NPPF states in paragraph 152 that the planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change, and that it should help to shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience.

18.3.2 Paragraph 154 states that that new development should be planned for in ways that avoid increased vulnerability to the range of impacts arising from climate change. Care should be taken to ensure that risks can be managed through suitable adaptation measures and that development can help to reduce greenhouse gas emissions.

18.3.3 Hampshire County Council declared a climate change emergency in June 2019, and two targets were set which are to be carbon neutral by 2050 and preparing to be resilient to the impacts of temperature rise. Policy 2 (Climate change mitigation and adaptation) of the Hampshire Minerals and Waste Plan states that minerals and waste development should minimize their impact on the causes of climate change. Where applicable, minerals and waste development should reduce vulnerability and provide resilience to impacts of climate change by being located and designed to help reduce greenhouse gas emissions and the more sustainable use of resources; or developing energy recovery facilities and to facilitate low carbon technologies; and avoiding areas of vulnerability to climate change and flood risk or otherwise incorporate adaptation measures.

18.3.4 The supporting text to Policy 2 states that minerals and waste development can provide opportunities to mitigate and adapt to the inevitable effects of climate change and this may include, relevant to this proposal, appropriate restoration of quarries, and the location of development adjacent to local markets which may provide opportunities to reduce emissions from, or created by transport. It also states that resilience means capacity for the environment to respond to changes by resisting damage caused by mineral and waste development and recovering quickly. This can be achieved by maintaining a robust and varied network of natural environments which will allow natural processes to change and adapt without costly intervention.

18.3.5 Policy S1 of the Eastleigh Borough Local Plan 2016-2036 states that to be sustainable, new development in the borough should have regard to the potential impacts of climate change. Policy DM3 states that all development should be designed to adapt to the predicted climate change impacts for the

borough. Policy DM11 states that planning application should protect, conserve and enhance sites with nature conservation designations as well as networks of natural habitats and features, and facilitate their adaptation to climate change wherever possible.

**Sustainable Development**

18.3.6 The NPPF in paragraph 8 considers sustainable development to have three overarching objectives, which are economic, social and environmental. The economic objective is concerned with helping to build a strong, responsive and competitive economy; the social objective to support strong, vibrant and healthy communities, and the environmental objective to contribute to protecting and enhancing the natural, built and historic environment.

18.3.7 Paragraph 11 sets out the presumption in favour of sustainable development, meaning that for decision taking this means approving development proposals that accord with an up to date development plan without delay; or where there are no development plan policies, or the policies which are most important are out of date, granting permission unless the application of policies in the NPPF that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in within the NPPF taken as a whole.

18.3.8 Paragraph 177 states that the presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site, either alone or in combination with other plans or projects, unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of a habitats site.

18.3.9 Policy 1 (Sustainable Development) of the Hampshire Minerals and Waste Plan 2013 follows this approach, taking a positive approach to minerals and waste development that reflects the presumption in favour of sustainable development contained in the NPPF. Development that accords with the Plan is considered

to be sustainable and will be approved unless material considerations indicate otherwise.

## 18.4 Impact of the project on climate change and vulnerability to climate change

18.4.1 The proposed development is described above in section 6. This proposal has the potential to be affected by, and to affect climate change, in the following ways:

- Flood risk
- Vehicle emissions
- Use of renewable energy
- Site location relative to market
- Changes to habitat

**Flood Risk**

18.4.2 The site is wholly within Flood Zone 1 and as such complies with the policies which seek to direct development to areas with the lowest risk of flooding. Climate change has been fully taken into account in Chapter 8 of the ES in respect of flooding. The Flood Risk Assessment (Appendix 2.2) addresses flood risk to the site in Section 5, and in paragraph 5.7 states that there is over 10m elevation between the minimum site elevation and flood levels from the rivers and sea at present. This is well above any expected rise in sea level rise, and extreme wave height of peak river flow in the area over the duration of the development, as defined in the EA guidance for climate change allowances.

18.4.3 The impact of climate change on the flood risk from the proposed development to the surrounding area is considered in Section 7 of Appendix 2.2. Projections of future climate change in the UK suggest that short-duration, high-intensity rainfall and periods of long duration rainfall will become more frequent, which needs to be accounted for in calculating off-site flood risk.

18.4.4 Future climate change has been accounted for in run-off calculations with an increase of 10% applied to the rainfall for the anticipated duration of extraction, and a 40% increase to rainfall applied for the restoration phase. applied to the rainfall in accordance with the NPPF. The FRA concludes that the proposed development would result in reduced off-site run-off rates during the operational period given the large voids created within the quarry itself where the water would be directed to. Post-restoration, the surface water run-off will be mitigated by a Sustainable Drainage Strategy which includes pond features within the site and infiltration trenches on the boundary.

18.4.5 It is therefore considered that climate change has been fully accounted for in the flood risk calculations and it has been demonstrated that the proposal has been made resilient to climate change and will not increase the risk of off-site flooding should rainfall increase in line with climate change predictions.

**Vehicle emissions**

18.4.6 CEMEX fleet drivers are trained in Safe and Fuel-Efficient Driving (SAFED) scheme and are regularly assessed on their fuel usage and driving style, in order to reduce the quantity of fuel used and as such, carbon dioxide and other emissions accordingly. CEMEX also runs a dedicated programme called Be CareFUEL focussing on all aspects of fuel usage including a general awareness campaign, fuel saving information in driver handbooks, MPG reports by driver, vehicle, type and locations, allowing for specific targeting of areas for improvement.

18.4.7 A 50% bio-diesel fuel blend is also being trialled and subject to outcomes may be rolled out across the business. CEMEX also focus on logistics planning to maximise payload and minimise empty running vehicles, decreasing overall journeys.

18.4.8 All the CEMEX vehicles and those of our sub-contractors operate Euro VI vehicles which are the most modern and clean engine type. It is the EU standard for new vehicles with the lowest $NO_2$ emissions. The CEMEX fleet and our sub-

contractor vehicles in this area are mostly less than 5 years old. Typically, Cemex replace our fleet every five years to ensure that our vehicles remain modern, efficient and with low emissions. We also are investigating the status and availability of alternatively fuelled vehicles.

18.4.9 The proposed use of the site will result in additional vehicle movements to and from this site compared to the current situation, and as such, associated emissions which can impact on climate change. This is a short-term and temporary impact. However, these are being minimised as far as possible using the above measures, to prevent impacts on climate change, and impact of this on air quality has been assessed in Chapter 8 to be negligible. There are no viable alternatives to this transport method from this site.

18.4.10 Minerals can only be worked where they are found and each county has a requirement set by Government to maintain a landbank of sand and gravel. This site has been through a process in the drafting of the Hampshire Minerals and Waste Plan 2013 of comparing the site to others, and this was found to be the most sustainable location. The site is not located close to any other sand and gravel sites and is needed in addition to wharves to maintain the supply of sand and gravel in Hampshire. The location of this site will prevent vehicles travelling from further afield to bring the mineral to this area, and this is discussed in more detail below.

**Site location relative to market**

18.4.11 The site at Hamble is well located relative to its market and as such will result in a sustainable source of supply to the local area. The location of active quarries in Hampshire in 2018 (taken from the 2019 LAA which is the most recent) shows that there are no other quarries in close proximity to this site, with the nearest by road being Marchwood Quarry, over 13 miles away on the other side of Southampton close to the New Forest. Most of the quarries in Hampshire are clustered around the south-west, and as such this site is better placed to serve the markets in the Hamble area and the urban market areas on the eastern side of Southampton, towards Portsmouth and Waterlooville, given the close

proximity of the site to the M27. It will therefore reduce transport time and road miles currently travelled by HGVs to reach sites in the local area, thereby reducing vehicle emissions as well as associated noise and air quality impacts overall.

**Habitat change and impact on species**

18.4.12 Climate change is leading to loss of species, which have to adapt to new climate patterns and loss of habitat, as well as altered competitive relationships between species. DEFRA's 2020 Biodiversity Strategy states that over 40% of priority habitats and 30% of priority species were declining in the most recent analysis.

18.4.13 The site is not covered by any nature conservation designations, however it is close to a number of designated sites, which are the Solent and Southampton Water Special Protection Area (SPA) and Ramsar and the Solent Maritime Special Area of Conservation (SAC), all of which are located approximately 340 metres to the east of the site at their nearest point. The River Hamble, which lies approximately 410 metres to the east of the site at its nearest point, also forms part of the Solent and Dorset Coast SPA. The closest national, statutory designated sites include the Lee-On-The Solent to Itchen Estuary Site of Special Scientific Interest (SSSI) and Mercury Marshes Local Nature Reserve (LNR), which both lie 340 metres to the east, and Lincegrove and Hackett's Marshes SSSI which lies 350 metres to the north-east. All of these national, statutory designated sites also form constituent parts of the above international designated sites.

18.4.14 In terms of the habitats on site, these comprise mainly semi-improved grassland, scrub, native hedgerows, broadleaved woodland and scattered trees. All are considered to be of local importance only. The boundary vegetation is proposed to remain during working, with a large stand-off to the bund and extraction area, with a fence installed to protect retained trees from the working area.

18.4.15 Whilst habitats within the extraction area would be lost as a result of the working, this loss would be phased and the site progressively restored as it is worked.

The habitats to be replaced on the site would be of significantly greater biodiversity value; over 10% for the site as a whole in terms of habitats, and a gain of over 130% in terms of hedgerows. As such the impact on habitats would be an improvement in biodiversity terms following the proposed development.

18.4.16 In terms of on-site species, a suite of ecological surveys has been undertaken. Mitigation measures are proposed for badgers, bats, breeding birds, hedgehogs and invertebrates, in terms of enhancement of vegetation, precautionary measures during working and sensitive timing of works to avoid harm. There is a large population of reptiles (slow worm and common lizard) which has been identified on site, and a more detailed mitigation strategy has been designed to prevent harm to these reptiles during the operation of the site. The measures include trapping and relocating the reptiles within the site as the operations progress, moving them to unworked and to restored phases, as well as the site margins. Once the site has been restored, with increased biodiversity gain to the habitats, it is expected that the on site species will increase as a result of the improved site habitat.

18.4.17 In terms of affecting off-site European designated habitats, this has been assessed in a Habitat Regulations Assessment (Appendix 4.2). The HRA states that whilst the development has potential to cause disturbance to feeding birds, the proposed mitigation in the form of the earth bund and stand-off will reduce noise levels such that disturbance to waders, ducks, geese and turns is highly unlikely to occur. The HRA concludes that the proposals will not have an adverse effect on the integrity of the designated sites, either alone or in combination with other plans and projects.

**Use of renewable energy and other energy saving initiatives**

18.4.18 CEMEX uses 100% renewable electricity at all UK sites, in partnership with energy group Engie. The energy that will supply Hamble comes from 100% renewable sources including wind and solar energy.

18.4.19 CEMEX also are looking at a wide range of energy initiatives and ideas that can be rolled out across sites. For Hamble, these could include:

- Solar panels and wind turbines to generate energy
- Energy monitoring using Power Bi dashboards to track energy usage and electric monitoring sensors on equipment to see energy usage
- Car EV charging points
- Condition monitoring sensors, which ensure the plant is running efficiently therefore reducing energy usage
- Mobile plant telemetry sensors to monitor fuel usage and efficiency to reduce fuel wastage
- Energy saving opportunities such as using LED lighting and solar powered lighting with motion sensors
- Lower level external lighting towers to reduce power consumption and associated cost
- Use of timers on equipment so they are only running when required

18.4.20 If the site is granted planning permission, this will be considered further in terms of what can be installed on the site, and some measures may be imposed through planning conditions.

## 18.5 Whether the proposal is sustainable development

18.5.1 The location of the site has been through a process of site sifting and assessment during the preparation of the Hampshire Minerals and Waste Plan 2013, which concluded that the site was the best option for providing a local supply of sharp sand and gravel for this part of south Hampshire. The proposal to extract mineral at this site has been through a process of Environmental

Impact Assessment and it is considered that working the site is possible without having any significant adverse impacts on the environment or amenity.

18.5.2 According to Hampshire's latest Local Aggregate Assessment, the County's landbank is below 7 years, only rising just above this if current applications within awaiting decision are granted. Current data also shows that many sites within the County will be exhausted by 2025 unless further sites/extensions come forward, and the Mineral Planning Authority has to plan ahead to maintain the landbank for the plan period.

18.5.3 The LAA also states that a significant increase in planned infrastructure has been identified in the medium term. There are a number of housing and transport projects planned which are expected to manufacture increased aggregate demand within Hampshire. These include in the region of 120,000 new homes planned within Hampshire over the next 15 years, a number of bypass projects planned or under construction including Botley, and junction improvements and upgrades to the M27. The County Council also have a number of highway improvement schemes planned.

18.5.4 The location of the site will also result in a sustainable source of supply to the local area. The location of active quarries in Hampshire in 2021 shows that there are no other quarries in close proximity to this site, with the nearest by road being Marchwood Quarry, over 13 miles away on the other side of Southampton close to the New Forest. Most of the quarries in Hampshire are clustered around the south-west, and as such this site is better placed to serve the markets in the Hamble area and the urban market areas on the eastern side of Southampton, towards Portsmouth and Waterlooville, given the close proximity of the site to the M27. It will therefore reduce transport time and road miles currently travelled by HGVs to reach sites in the local area, thereby reducing vehicle emissions as well as associated noise and air quality impacts overall.

18.5.5 It is therefore clear that the extraction of the mineral at this site is required to continue to supply local construction projects with the necessary sand and

gravel. The location of the site has already been considered sustainable at the time of its allocation in the plan, and this Environmental Impact Assessment has demonstrated that the site can be worked without significant adverse impacts on the environment.

18.5.6 The proposal would result in economic and social benefits, given the revenue generated by the quarry in terms of aggregate levy, business rates and job creation, and the supply of mineral to the local area for construction projects including housing and schools which has a significant social benefit. The quarry has significant environmental benefits upon restoration in terms of additional biodiversity gain.

18.5.7 For these reasons, it is considered that the proposal constitutes sustainable development.

## 18.6 Conclusion

18.6.1 The 2017 Regulations introduced a requirement to take into account climate change in Environmental Statements, in terms of a proposal's impact on climate change and its vulnerability to the effects of climate change.

18.6.2 It is considered that the proposal has the potential to impact on climate change through the effects of flood risk, vehicle emissions, energy consumption, location relative to market and the impact on habitats and species. However, it is concluded that the site minimises its impacts on climate change as far as possible, and given its location relative to the market, it prevents less sustainable vehicle movements bringing the material from further afield.

18.6.3 It is also considered that the proposal constitutes sustainable development, given that the mineral is required by Hampshire to maintain their landbank, and to supply housing, infrastructure and other building projects in the Hampshire area. There are no other quarries nearby and the site is needed in addition to wharves to provide sufficient sand and gravel to Hampshire. The proposal will have economic and social benefits, in terms of the revenue generated and local

job creation particularly, as well as allowing public access to parts of the site during operational and restoration periods. There are no significant adverse environmental effects during the operational period of the development and the proposal will have environmental benefits in terms of its restoration and the net gain in biodiversity.

18.6.4 It is therefore considered that the proposal constitutes sustainable development and its impact upon, and vulnerability to, climate change has been fully taken into account and minimised as far as possible.

# 19. SUMMARY AND CONCLUSIONS

## 19.1 Introduction

19.1.1 This Environmental Statement has been put together by professionally qualified competent persons in their relevant fields, and has assessed the impact of the proposals upon the following matters:

- Noise (Chapter 7)
- Water Environment and Flood Risk (Chapter 8)
- Landscape and Visual Impact (Chapter 9)
- Ecology (Chapter 10)
- Archaeology (Chapter 11)
- Air Quality (Chapter 12)
- Transport (Chapter 13)
- Soils (Chapter 14)
- Implications of No Development Scenario (Chapter 15)
- Human Health (Chapter 16)
- Vulnerability to Accidents and Disaster (Chapter 17)
- Climate Change (Chapter 18)

## 19.2 Conclusions

**Noise (Chapter 7)**

19.2.1 The noise chapter sets out the findings of the noise assessment. Current guidelines on noise are contained in the web-document "*Planning Practice Guidance*" for Minerals, first published in March 2014.

19.2.2 Site noise limits for the dwellings in proximity to the proposed quarry are suggested, based on the guidance contained within the Planning Practice

Guidance for Minerals having regard to the measured background noise levels at locations taken to be representative of the dwellings selected for this assessment.

19.2.3 Site noise calculations have been undertaken for six noise sensitive locations, taken to be representative of Hamble School and the nearest dwellings to the proposed quarry. The calculated site noise levels are presented for inspection and comparison with the suggested site noise limits at the receptors and demonstrate compliance with the suggested site noise limits at all nearest noise sensitive properties.

19.2.4 The calculated site noise levels for routine and temporary operations at the proposed quarry comply with the suggested site noise limits at all the assessment locations.

19.2.5 The impact of site noise on the Rail Trail public footpath to the south of the site and the SPA/SAC and Ramsar areas in the vicinity of the site has also been considered.

19.2.6 Since the proposed operations conform to the advice set out in the Planning Practice Guidance for Minerals with regard to both routine and temporary operations, it is considered that the site can be worked while keeping noise emissions to within environmentally acceptable limits.

**Water Environment and Flood Risk (Chapter 8)**

19.2.7 The hydrogeology and hydrology chapter considers the potential hydrological and hydrogeological impacts associated with the proposed excavation of sand and gravel, together with progressive restoration of the site using existing overburden and imported inert restoration materials.

19.2.8 The Site lies on an interfluve with surface water shed to the east towards the River Hamble and west towards Southampton Water. A small spring is present to the west of the Site at the head of a small stream that discharges to Southampton Water.

19.2.9 The Site is underlain by River Terrace Deposits (RTD) overlying clayey material comprising the Marsh Farm Formation (MFF) and sandier material comprising the Selsey Sand Formation (SSF). Given the Site's position on the interfluve, there is relatively little groundwater present within the RTD.

19.2.10 An impact assessment has been undertaken of the proposed excavation and subsequent restoration with imported inert restoration materials. A number of embedded mitigation factors are taken into account and the impact assessment suggests that there will be no significant impacts on groundwater, surface water or the spring feature.

19.2.11 A number of additional mitigation, compensation and enhancement measures are proposed to ensure that impacts from the Site are not significant.

19.2.12 Groundwater monitoring for level and quality will continue at the existing Site perimeter monitoring wells for a period of time post restoration to confirm that the Site is not having an impact on groundwater or surface water.

**Landscape and Visual Impact (Chapter 9)**

19.2.13 The application site lies within the Netley, Hamble and Bursledon Coastal Plain Landscape Character Area (LCA), and interfaces with the Hamble River Valley LCA to the east. The surrounding landscape character is of a Coastal Plateau; a level topography bisected by small valleys draining into the Solent to the south-west and the Hamble River to the east. Road and field patterns across the plateau are regular, and the landscape south of the railway is semi enclosed by dense mature woodlands around Royal Victoria Country Park parkland to the west and Badnam Copse to the north-east. North of the railway former market garden land is becoming increasingly degraded by equestrian use and new housing development.

19.2.14 This former airfield landholding landscape fabric is poorly managed, being un-grazed but with some mature remnant boundary hedgerows and linear woodland features; the former airfield chain-link fences are in a poor state of

repair. Whilst the landscape is likely to be locally valued, it is not designated at a national or local level. In addition, there are some significant detracting features within the surrounding area, with the proximity to the rail corridor, the visual intrusion within the landscape of the oil refineries at both Hamble and Fawley, the Southampton flight paths and more distant background traffic noise from the busy M27 and A35 corridors. The ***Landscape Sensitivity*** for this semi-enclosed area is therefore ***Medium to Low.***

19.2.15 In the short term, the development will temporarily alter the surrounding landscape character, with the establishment of a temporary mineral processing plant site for seven years, the establishment of additional temporary soil storage and screen mounds, internal conveyor and haul routes and areas of mineral extraction and infilling, being followed by restoration on a phased basis. The total duration of the development is expected to be thirteen years including the period for the importation of restoration materials.

19.2.16 The working and restoration scheme for the site has been designed to retain and protect the greater proportion of mature trees and existing hedgerows, with the removal of only three mature trees and a small area of the western boundary scrub margin to create the site access, and the removal of a small area of mature scrub in the south-east sector of the proposed working area.

19.2.17 The restoration will provide substantial additional peripheral woodland and hedgerow planting both as advance planting and at final restoration forming a medium to large scale field pattern, together with small ponds and wetter areas, and areas of new acid grassland.

19.2.18 Over 18,000 trees and shrubs will be planted, using native species found within the local area, creating enhanced nature conservation corridors as part of the site restoration proposals. The woodland, grassland, wetland, and hedgerow creation will integrate the restored landform into the surrounding landscape; the public rights of way network will be enhanced to enable them to be more useable and extended by a length of permissive path.

19.2.19 In the long term, the application site and its surroundings will benefit from an increase in native tree and shrub cover, and supplementary and replacement hedgerow planting that will reinforce existing boundaries and provide enhanced linkages across the restored landform. The ***magnitude of landscape impact*** for the application area post restoration is generally ***Low – Negligible***, with the greater part of the application area being restored to original ground levels and under a similar agricultural regime. The overall ***landscape impact significance*** of the site restoration in the longer term is therefore ***Minor-Neutral Beneficial***.

19.2.20 There are properties or publicly accessible viewpoints at the site boundaries from which views of the proposed mineral development area can be obtained. However, direct, open, proximate, extensive, or prolonged views of the application area from properties and public rights of way are mainly limited to the proposed soil storage mounds at the operational periphery.

19.2.21 Embedded and Additional Mitigation measures are proposed to minimise the landscape and visual impacts of the proposed development during both the preparation and operational phases of the scheme. These include:

- Further boundary advance hedgerow and tree planting.
- Retention, management, and supplementation of boundary vegetation.
- The design of the processing plant, minimising its height.
- Provision of grassed soil screen mounds for acoustic and visual screening.
- A phased scheme of working and restoration to reduce areas open at any one time.
- The design of the final restoration scheme to reinstate pastoral agriculture, and create new woodland, landscape, and conservation features in accordance with the principles set out in the Minerals Local Plan, and the Landscape Character Guidelines.

- Improvements to the condition of the existing Public Rights of Way Network.
- Provision of an additional length of permissive footpath as a safer alternative route to pedestrian use of part of the Satchell Lane public highway.
- Movement of the access slightly out of the RPA of T8

19.2.22 Once all the mitigation measures are considered, the residual landscape and visual effects of the development will be of ***Minor*** significance.

19.2.23 Views from the Conservation Areas, Listed Buildings and Registered Parks and Garden around the site which would be potentially affected by the proposed development are of ***Minor*** significance.

19.2.24 Enhanced nature conservation corridors will be created as part of the site restoration proposals. Significant areas of new woodland planting, hedgerows, and acid grassland seeding will be created to integrate the restored landform into the surrounding landscape, and the footpath will be extended by permissive paths around the edges of the site to provide safer routes connecting existing paths, Hamble Railway Station and The Hamble School.

19.2.25 Any anticipated long term residual landscape and visual effects of the proposals are likely to be minimal.

**Ecology (Chapter 10)**

19.2.26 It is concluded that the proposed project is only likely to have short-term adverse effects during the operational and restoration phases, mainly resulting from the temporary losses of habitat and associated disruption caused to species of fauna which use the site. It is considered that an optimal level of embedded ecological mitigation is being proposed for the operational phases of the project and any unavoidable, short-term adverse ecological effects will be controlled at an acceptable level and then soon offset in the post-restoration period. Any adverse

effects during the operational phases should also be counterbalanced to some degree by the predicted positive effects in relation to native hedgerows and off-site habitats.

19.2.27 The proposed restoration plan for the site will have an overall positive long-term effect in terms of the biodiversity value of the site itself, the effects on identified ecological features within the ZOI, and the site's ecological connectivity and functionality within the surrounding landscape.

**Archaeology (Chapter 11)**

19.2.28 A wide range of sources were consulted for this assessment, including the local Historic Environment Record, published articles and books and manuscript documents. In addition, the site has been visited for a visual inspection. The data gathered has provided the information required with which to make an initial assessment of the impact of the development proposals of the archaeological and historic landscape.

19.2.29 The assessment of direct impacts on archaeology and cultural heritage assets within the proposed development boundary shows that there will be an impact to:

1) Potential archaeological features as identified on the Council HER across parts of the site.

2) Aspects relating to the former military Hamble Airfield.
There is also a suggested impact to:

3) Presently unrecorded archaeological remains that may exist elsewhere on the Site.

19.2.30 It is therefore proposed to undertake appropriate archaeological investigation of the site prior to mineral extraction. Such works are proposed to be carried out across each quarry phase prior to workings commencing in that particular location. In the event that archaeological remains are identified, an appropriate

level of archaeological investigation and recording to mitigate any potential impact to any identified remains will take place.

19.2.31 Any such works can be secured through the imposition of a suitably worded planning condition. The works would be agreed with the Council Archaeological Office and be carried out in full accordance with approved WSIs. The WSIs will detail the undertaking of appropriate works to allow for a full and proper record of any archaeological remains within areas of proposed development to be made. These works will mitigate any perceived impacts to the archaeological resource.

19.2.32 The assessment of indirect impacts on all cultural heritage assets within the study area shows that the proposed quarry will have a low magnitude of change of a temporary nature to a small part of the Bursledon Conservation Area (western extent of Character Area 2), being a Medium sensitivity receptor. Assessment identifies the predicted impact to be of Minor Significance, which does not equate to an impact requiring mitigation. Nevertheless, the creation of soil storage bunds which will be grassed over and placed along the site's NE boundary will afford an increased protection to the setting of this part of the Conservation Area whilst quarry operations take place. Quarry operations will also be temporary in nature, prior to approved restoration taking place. Following site restoration, any minor effect to the setting of the designation will be restored.

19.2.33 There are no other identified significant indirect effects on the archaeological and heritage resource as a result of the proposed development. The proposed quarry is not located within the primary setting of any additional surrounding cultural heritage asset. There may be changes to long distance and/or obscured views in some circumstances, but none of these changes are relevant to planned views or vistas from cultural heritage assets and those minor changes are not assessed as compromising the understanding or historic significance of any feature.

**Air Quality (Chapter 12)**

19.2.34 The operational impacts of increased emissions arising from the additional traffic on local roads due to the development have been assessed. Concentrations have been modelled at ten existing receptors, representing properties where the impacts are expected to be greatest. It is concluded that concentrations of $NO_2$, $PM_{10}$ and $PM_{2.5}$ will remain below the relevant limits (AQALs) at all existing receptors in 2023, whether the scheme is developed or not, and that the impacts will be negligible.

19.2.35 The operational phase dust risk assessment has determined that, with the designed in mitigation measures, the magnitude of the dust effect from the extraction of the minerals is also negligible.

19.2.36 Given that the impact of the proposed development is negligible, it is considered that the effects of the operation of the proposed development on air quality and dust will be insignificant.

19.2.37 There should be no constraints to the development of the site, with regard to the air quality and dust effects on local receptors, as the proposed development is consistent with the relevant development plan policies.

**Transport (Chapter 13)**

19.2.38 This chapter has assessed the environmental effects of the predicted increases in traffic associated with the proposed development which were assessed as negligible in all respects.

19.2.39 Further information has been submitted at the Regulation 25 stage which has assessed junction capacity and updated the background traffic data to 2022. Further information has also been submitted in terms of justification for the site access, swept path data for the site layout, updated Personal Injury Accident Data and Traffic Impacts. This has shown that the peak periods have changed since 2017 and the proposed development would have a maximum impact on two-way total traffic flows of 2.4% in the morning peak and 1.7% in the evening

peak, and typically less than 1% throughout the day on Hamble Lane in the vicinity of the site access. This falls within the negligible impact (less than 30% increase in traffic). The overall traffic flows on Hamble Lane are 5-10% less than they were in 2017.

19.2.40 The conclusions of the transport chapter are as follows:

| Potential impact | Nature of impact | Significance prior to mitigation | Mitigation / Enhancement measures | Residual effect |
|---|---|---|---|---|
| Severance | Direct | Negligible | Environmental Management Plan and HGV Routing Management Plan.<br><br>Contributions towards walking and cycling improvements identified in EBC's LCWIP<br>Restriction on HGVs exiting the site when there are the highest number of walking and cycling movements | Negligible |
| Driver Delay | Direct | Negligible | | Negligible |
| Pedestrian Delay | Direct | Negligible | | Negligible |
| Pedestrian Amenity | Direct | Negligible | | Negligible |
| Fear and Intimidation | Direct | Negligible | | Negligible |
| Accidents and Safety | Direct | Negligible | | Negligible |
| Hazardous Loads | Direct | Negligible | | Negligible |
| Dirt on the Highway | Direct | Negligible | | Negligible |

**Soils and Agricultural Land Classification Assessment (Chapter 14)**

19.2.41 The soil resource assessment was carried out at the Regulation 25 stage, at the request of Natural England. The soils at the site have been tested by an independent soils advisor who has concluded that the site is not agricultural land, given its previous airfield/grassland use which has reverted to extensive scrub and amenity grassland over a period of at least 25-30 years. It is considered that to bring this site into agricultural use would require significant intervention and given the severe constraints in terms of its agricultural potential, it is concluded that it should be designated as non-agricultural.

19.2.42 In terms of soils, the site is occupied by two soil types, which are medium clay loam topsoil overlying medium and heavy clay loam subsoil, and medium textured stony soils. The chapter concludes that soil stripping, storage and re-instatement should occur during drier periods of the year, and good practice guidance should be followed in terms of soils storage and handling. These measures can be secured via planning conditions. With the appropriate soil handling and restoration using the in-situ soils which will be stored as bunds during site working, the impact in the longer term is considered to be minor adverse.

**Implications of No Development Scenario (Chapter 15)**

19.2.43 It is concluded therefore that should the development not go ahead, the natural baseline of the site would continue to evolve with similar species as are currently there. The vegetation would likely be kept in check by some animal grazing and site management. Over time, if the site was completely unmanaged, eventually grassland may give way to pioneer tree species and eventually, over a very long period of time the site may contain largely woodland. If the site was not worked, it is likely that the biodiversity value of the site would be less than is proposed through the restoration of the site. If mineral extraction did not go ahead it is also possible that other development eventually would, and this would sterilise the mineral resulting in it having to be imported from further afield.

**Human Health (Chapter 16)**

19.2.44 The ES assesses the potential impact of the proposal in relation to the water environment, noise, air quality, transport, and visual impacts. These potential pathways to impacts on human health have been considered within this assessment and, drawing on the conclusions of Chapters 7 to 9, and Chapters 12 and 13, no significant adverse effects to human health have been identified as a result of the proposals. A further assessment on Human Health is included at Appendix 10.1.

**Vulnerability to Accidents and Disaster (Chapter 17)**

19.2.45 The Proposal is not considered to be highly vulnerable to accidents or disasters as a result of the nature of operations proposed within the Application Site. Whilst there are pipelines on the edges of the site, large stand-offs between the pipelines and the extraction area have been designed into the scheme to mitigate any risk. There is a medium risk of unexploded ordnance/bombs due to the site history, however robust mitigation as set out above will be put in place to deal with the risk.

19.2.46 Therefore, no likely significant effects on the environment have been identified as result of potential accident and disasters affecting the Proposal.

**Climate Change (Chapter 18)**

19.2.47 The 2017 Regulations introduced a requirement to take into account climate change in Environmental Statements, in terms of a proposal's impact on climate change and its vulnerability to the effects of climate change.

19.2.48 It is considered that the proposal has the potential to impact on climate change through the effects of flood risk, vehicle emissions, energy consumption, location relative to market and the impact on habitats and species. However, it is concluded that the site minimises its impacts on climate change as far as possible, and given its location relative to the market, it prevents less sustainable vehicle movements bringing the material from further afield.

19.2.49 It is also considered that the proposal constitutes sustainable development, given that the mineral is required by Hampshire to maintain their landbank, and to supply housing, infrastructure and other building projects in the Hampshire area. There are no other quarries nearby and the site is needed in addition to wharves to provide sufficient sand and gravel to Hampshire. The proposal will have economic and social benefits, in terms of the revenue generated and local job creation particularly, as well as allowing public access to parts of the site during operational and restoration periods. There are no significant adverse

environmental effects during the operational period of the development and the proposal will have environmental benefits in terms of its restoration and the net gain in biodiversity.

19.2.50 It is therefore considered that the proposal constitutes sustainable development and its impact upon, and vulnerability to, climate change has been fully taken into account and minimised as far as possible.

**Cumulative impacts**

19.2.51 Each chapter has assessed the likely cumulative impacts of the development, and they have considered the impact of this proposal, in conjunction with other nearby developments, including other nearby quarries and housing developments, both under construction and proposed; within a relative distance that could cause cumulative effects. The cumulative impacts have been built into the transport assessment, which the air quality assessment has relied upon in terms of emissions.

19.2.52 No chapters have identified any significant cumulative impacts, and this includes impacts in terms of noise, air quality, archaeology, ecology and transport.

## 19.3 Conclusion

19.3.1 The EIA process has demonstrated that the proposed development can be operated with no unacceptable effects on quality of life and the local environment, provided that the various mitigation measures recommended are implemented. The mitigation measures and further controls, as necessary, can be imposed via planning conditions and legal agreement.

19.3.2 The restoration proposals will bring long term positive enhancements to the area with ecological and biodiversity enhancements by way of the creation of UK and Eastleigh Biodiversity Action Plan priority habitats, which will attract a wide range of species, and result in a significant beneficial effect in ecological terms, and a beneficial impact upon the landscape. The restoration will also provide

recreational benefits with a permissive path and recreation area. Restoration will be undertaken to high environmental standards in accordance with the requirements of the NPPF and Development Plan policies.

19.3.3 The temporary mineral extraction will not result in any long-term significant adverse impacts, and the few identified moderate and minor temporary adverse impacts are within acceptable levels as set out in the relevant guidelines.

19.3.4 Minerals can only be worked where they are found and where it is environmentally acceptable to do so. This site has been identified in the Hampshire Minerals and Waste Local Plan 2013 as the best option to supply this area of south Hampshire, and is required along with other land-won and marine sand and gravel to maintain a steady supply of sand and gravel to Hampshire.

19.3.5 The Environmental Statement has also addressed the impact of the development on climate change, and outlines the measures that CEMEX takes to ensure its operations reduce impacts on climate change and that the effects of climate change are fully taken into account in terms of the assessment process.

19.3.6 Cumulative effects refer either to the incremental additional effects of more than one mineral operation in the vicinity or to the combined environmental effects of the proposed development with other intensive activities in the locality. No significant impacts have been identified during the environmental impact assessment process which indicate that approval of the proposed development will, in combination with other local activities taking place in the area, result in unacceptable harm to the environment or local amenities.

19.3.7 The Environmental Statement supports the planning application for the proposed sand and gravel extraction at the application site, and it is considered that sufficient information has been provided to allow the Minerals Planning Authority to conclude that the development is acceptable in environmental terms.

# 20. GLOSSARY AND ABBREVIATIONS

**A generic list of some of the terms used in the Environmental Statement and accompanying documentation**

**Accumulated Temperature (ATO)** - Temperature above 0°C between January and June, reported as day°C

**Acoustic Environment** – Sound from all sound sources, as modified by the environment.

**Aftercare** – The steps to be taken to bring land to the required standard for its intended use once mineral working has taken place, and its subsequent maintenance.

**Aggregates** – Sand, gravel, crushed rock and other bulk materials used by the construction industry.

**Agricultural Land Classification (ALC)** – This forms part of the planning system in England and Wales and involves classification of agricultural land into five categories according to versatility and suitability for growing crops. The top three grades (Grade 1, 2 and 3a) are referred to as 'Best and Most Versatile' land.

**ALC Grade 1** - Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

**ALC Grade 2** - Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable

root crops. The level of yield is generally high but may be lower or more variable than Grade 1.

**ALC Subgrade 3a** - Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseeds and roots.

**ALC Subgrade 3b** - Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year

**ALC Grade 4** - Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

**ALC Grade 5** - Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

**Air Quality Management Area (AQMA) –** An area which has been designated due to poor air quality, where improvements are necessary. AQMAs have an Action Plan describing the pollution reduction measures to be put in place.

**Ambient Sound Level** – Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. Normally expressed as the equivalent continuous A-weighted sound pressure level ($L_{Aeq,T}$)

**Annual Monitoring Report (AMR)** – A report submitted to the government by local planning authorities or regional planning bodies assessing progress with and the effectiveness of a Local Development Framework.

**Apportionment** – The splitting of regional supply guidelines for minerals demand between planning authorities and sub-regions.

**Aquifer** – An underground layer of water-bearing permeable rock, rock fractures or unconsolidated materials. The study of water flow in aquifers and the characterisation of aquifers is hydrogeology.

**Arable** – Land growing crops subject to seasonal ploughing or cultivations typically at this site being wheat, barley, oilseed rape, maize and/or potatoes.

**Area of Outstanding Natural Beauty (AONB**) – A designated area that has been confirmed by the Government as having the highest status of protection in relation to landscape and scenic beauty.

**Archaeological Assessment/Evaluation** – An assessment of the potential archaeological interest of a site or building. This can be either as desk-based assessment or a field assessment, involving ground survey and small scale pits or trial trenching carried out by professionally qualified archaeologists looking for historic remains.

**Area of Significant Local Environmental Value** – A locally designated area of landscape importance having less status to an AONB in the development control process.

**Auger** – A 1.2m metal rod used to recover soil cores manually form the ground.

**Automatic Traffic Count (ATC) Surveys –** Used to collect vehicle traffic data on roads, including classification and speed data. There are a variety of methods and equipment that can be used.

**Average Annual Daily Traffic (AADT)** – The total volume of vehicle traffic of a highway or road, for a year, divided by 365 days.

**Average Annual Rainfall (AAR)** – Based on the 1961-1988 Agroclimate Dataset

**A-weighting –** Applied to instrument-measured sound levels in order to replicate the sensitivity of human hearing. Measurements in dB(A) broadly agree with people's assessment of loudness.

**Background Sound Level ($L_{A90,T}$)** – A-weighted sound pressure level of the residual sound at the assessment position with no operation occurring at the proposed site. Defined in terms of the $L_{A90,T}$ which is the "A-weighted" noise level exceeded for 90% of the specified measurement period.

**Best and Most Versatile Agricultural Lane (BMV)** – Land falling in Agricultural Land Classification grades 1, 2 and 3a

**Biodiversity** – The diversity of plant and animal life in a particular habitat.

**Birds of Conservation Concern (BoCC) –** Birds which are on the Red List of endangered bird species

**British Trust for Ornithology (BTO) –** Provides information about birds and their habitats

**Bund** – An artificial mound or embankment used to either screen a site from view, or reduce noise emissions.

**Conservation Area** - An area of notable environmental or historical interest or importance which is protected by law against undesirable changes. Trees in conservation areas are also protected and permission has to be sought from the local authority for works to trees.

**Chartered Institute of Ecology and Environmental Management (CIEEM) –** Professional membership body representing ecologists and environmental managers**.** Full members use the letters MCIEEM after their name.

**Chartered Member of the Landscape Institute (CMLI)** – Qualified landscape professional who has sufficient skills and experience to have passed the Landscape Institute Chartership exam.

**dB** – Decibel: Noise levels measured using the decibel scale which is based on logarithmic progression. A change of 10 dB corresponds to a doubling of loudness: changes of less than 3dB are not normally regarded as noticeable.

**Departure** – A proposed development that is not in accordance with the adopted development plan, but for which the local planning authority proposes to grant planning permission.

**Development** – Development is defined under the 1990 Town and Country Planning Act as 'the carrying out of building, engineering, mining or other operation in, or, over or under land, or the making of any material change of use of any building or other land'. Most forms of development require planning permission.

**Development Plan Document (DPD) –** Planning policy documents which make up the Local Plan.

**Digital Terrain Model (DTM)** – A mathematical representation (model) of the ground surface that contains elevations of natural terrain features.

**Design Manual for Roads and Bridges (DMRB) -** A series of volumes that provide standards, advice notes and other documents relating to the design, assessment and operation of trunk roads and motorways in the UK and Republic of Ireland.

**Drought or droughtiness** – The susceptibility of land to drying out and the degree to which soil moisture may be in deficit during the year

**Ecological Impact Assessment (EcIA) –** An assessment of the ecological impact of a development, including the magnitude of the impact, mitigation and residual impacts.

**Environment Agency (EA)** – A government body that aims to prevent or minimise the effects of pollution on the environment and issues permits to monitor and control activities that handle or produce waste. It also provides up to date information on waste management matters and deals with other matters such as water issues including flood protection advice.

**Environmental Impact Assessment (EIA)** – Under the Town and Country Planning (Assessment of Environmental Effects) Regulations 1998 applicants of certain scheduled developments are required to submit with their planning application an accompanying environmental statement that evaluates the likely environmental impacts of the development, together with an assessment of how the severity of the impacts could be reduced.

**Equivalent Continuous A-weighted Sound Pressure Level ($L_{Aeq,T}$)** – Value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval T, has the same mean square sound pressure as a sound under consideration whose level varies with time.

**European Protected Species (EPS) –** Species of plants and animals (other than birds) protected by law throughout the European Union. Listed in Annexes II and IV of the European Habitats Directive. They receive full protection under the Conservation of Species and Habitats Regulations 2017.

**Field Capacity Days (FCD) -** a meteorological parameter which estimates the duration of the period when the soil moisture deficit is zero. Soils usually return to field capacity (zero deficit) during the autumn or early winter and the field capacity period, measured in days, ends in the spring when evapotranspiration exceeds rainfall and a moisture deficit begins to accumulate.

**Flood Zone 1** – Defined as being outside the area that is expected to be affected by the 1:1000 year fluvial event.

**Flood Zone 2** – Defined as land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%).

**Flood Zone 3** – Defined as land assessed as having a 1 in 100 or greater annual probability of river flooding (> 1%).

**Flood Risk Assessment** – An assessment of the likelihood of flooding in a particular area so that development needs and mitigation measures can be carefully considered.

**Free-field** – External sound field in which no significant sound reflections occur (apart from the ground). Measurements made 1.2m to 1.5m above the ground and at least 3.5m away from other surfaces are usually regarded as free-field.

**Geographic Information Systems (GIS)** – A system designed to capture, store, manipulate, analyse, manage and present geographical data.

**Gleying** – Specific soil colours usually produced in response to periods of waterlogging or imperfect drainage.

**Great Crested Newt (GCN) –** A large Eurasian newt which is a European Protected Species and the animals, their eggs, breeding sites and resting places are protected by law.

**Green Belt** – A planning land use policy for controlling urban growth and coalescence of settlements.

**Groundwater** – An important part of the natural water cycle present underground.

**Guidelines for Landscape and Visual Impact Assessment (GLVIA) –** The industry standard setting out the principles of assessment and the process of assessing the landscape and visual effects, and their significance.

**Habitat** – The type of environment within which a plant or animal species normally lives or occurs.

**Heavy Goods Vehicle (HGV) –** Any truck with a gross combination mass of over 3,500 kilograms.

**Horizon** – A layer within the soil that usually can be clearly defined due to colour, organic matter, texture, stone content or drainage characteristics

**Institute of Air Quality Management (IAQM)** – The professional body for air quality professionals, and produces guidance on air quality issues.

**Institute of Environmental Management and Assessment (IEMA) –** The largest professional body for environmental practitioners in the UK and worldwide. A not for profit organisation which aims to promote best practice standards in environmental management, auditing and assessment.

**LAeq** – Used in acoustics to describe the average sound energy in decibels over a period of time.

**LA90** – The background noise level exceeded for 90% of the measurement period.

**Landbank** – The stock of land with planning permissions where reserves have yet to be worked.

**Landscape and Visual Impact Assessment (LVIA) –** The process of evaluating the effect of a development proposal on the landscape, in terms of the visual effects (human view or perception) and the landscape effects (which occur whether or not anyone can see them).

**Landscape Character Assessment (LCA) –** The process of identifying and describing variation in character of the landscape. LCA documents identify and explain the unique combination of elements and features that make landscapes distinctive by mapping and describing character types and areas.

**Limitation (soils)** – A factor affecting the ability to effectively farm or manage the land at the site which imposes a restriction on its flexibility to grow certain crops

**Listed Building** – A building that has been placed on the Statutory List of Buildings of Special Architectural or Historic Interest. A listed building may not be demolished, extended or altered without special permission. Their setting is also protected through the development control process.

**Local Aggregate Assessments (LAAs**) – A requirement of the NPPF is that Mineral Planning Authorities are now requested to prepare an assessment of their local aggregate needs based on a rolling average of ten years worth of sales data and other relevant local information.

**Local Air Quality Management (LAQM) Technical Guidance (TG16) –** Guidance issued by DEFRA which is designed to support local authorities in carrying out their duties under the Environment Act 1995, the Environment (Northern Ireland) Order 2002 and subsequent regulations.

**Local Biodiversity Action Plan (LBAP) –** The means by which the UK Biodiversity Action Plan are implemented at the local level. Targets set nationally for species and habitats of conservation concern are translated into actions which are achievable in a local context. Provide a focus for the conservation of locally valued species and habitats.

**Local Wildlife Site (LWS) –** Areas of land in England which are especially important for wildlife and have been identified and selected locally using scientifically determined criteria and detailed ecological surveys. Previously known as Sites of Nature Conservation Importance (SNCI) and are known by other names in Wales, Scotland and Northern Ireland.

**Managed Aggregate Supply System (MASS**) – The means in which construction aggregate supply has been managed in England since the mid 1970's.

**Minerals and Waste Framework** – The framework will set out the County Councils spatial strategy for future minerals and waste development. The framework will contain several development plan documents; a suite of Development Control policies, Site Specific Allocations and Policies and an illustrative proposals map.

**Minerals Industry Research Organisation (MiRO) –** An international collaborative research organisation which manages research activities

**Minerals Local Plan (MLP)** – The plan written by the Minerals Planning Authority (usually the County or Unitary Authority) which sets out the local policies for determining the location and need for mineral extraction sites and policies against which to determine applications for minerals development.

**Multi-Agency Geographic Information for the Countryside (MAGIC) -** The MAGIC website provides authoritative geographic information about the natural environment from

across government. The information covers rural, urban, coastal and marine environments across Great Britain.

**National Air Quality Strategy (NAQS) –** Defines air quality standards for eight major pollutants, one of which is for $PM_{10}$, and sets objectives for reductions in the concentrations of those pollutants.

**National Character Areas (NCA)** – A subdivision of England as defined by Natural England and based on a combination of landscape, biodiversity and geo-diversity and economic activity.

**National Planning Policy Framework (NPPF)** - A document published by the Government that sets out its national planning policies and as to how these should be applied at the plan making level and in the development control making process. First written in 2012 and updated in 2018.

**National Planning Practice Guidance (PPG) –** Online planning guidance written by the Government which adds further context to the National Planning Policy Framework.

**Natural England** – The Government's advisor for the natural environment in England.

**Natural Environment and Rural Communities Act (NERC) -** This Act received Royal Assent in March 2006. It was designed to help achieve a rich and diverse natural environment and thriving rural communities. The Act established the body Natural England and made amendments to the Wildlife and Countryside Act 1981 and Countryside and Rights of Way Act 2000.

**Need** – A need for mineral when assessed against existing permitted reserves of suitable material taking into account any apportionment and other appropriate guidance.

**Noise-Sensitive Premises –** Any occupied premises outside a site used as a dwelling (including gardens), place of worship, educational establishment, hospital or similar institution, or any other property likely to be adversely affected by an increase in noise level.

**Ordnance Survey National Grid Reference (NGR)** – A system of geographic grid references used in Great Britain, distinct from latitude and longitude.

**Overburden –** Soil overlying a mineral deposit, that must be moved to reach the mineral and is often used in restoration of the site.

**Planning Conditions** – Requirements attached to a planning permission to limit, control or direct the manner in which the development is carried out.

**Planning Gain** – Part of a development proposal that is secured by the local authority for the benefit of the local community.

**Planning Obligation** – A commitment made by the landowner under Section 106 of the Town and Country Planning Act in conjunction with the granting of planning permission, either in the form of an agreement with the local planning authority or as a unilateral undertaking.

**Piezometric Levels** – Observation wells that give an indication of the water levels within a geological formation.

**$PM_{2.5}$ Particulates** – Particulate matter (solid particles and liquid droplets) in the air which is human-made or naturally occurring, and has a mass per cubic metre of air of particles with a size (diameter) less than 2.5 micrometres (one $400^{th}$ of a millimetre). Also known as fine particulate matter.

**$PM_{10}$ Particulates** – Particulate matter 10 micrometers or less in diameter.

**Preferred Areas** – An area identified in a development plan where it is considered that mineral working is possible without imposing significant adverse impacts on the environment or local community.

**Public Right of Way** – A route where the public has a right to walk, and in some cases ride horses, bicycles, motorcycles or drive motor vehicles, which will be designated either as a footpath, a bridleway, a road used as a public path (RUPP) or a byway.

**Restoration** – The steps taken to return land to an acceptable condition following mineral working.

**Radial** – In the minerals industry this is a term used to describe the market area for the delivery of mineral. For the movement of mineral via a HGV this is usually dictated by accessibility to the highway network, the weight being transported, and diesel and driver costs.

**Rail Aggregate Depot** – A rail served facility that enables the movement of aggregate to markets further across regions because of greater economies of scale.

**Registered Gardens** – The Register of Historic Parks and Gardens of special historic interest in England that provides a listing and classification system for historic parks and gardens similar to that used for listed buildings.

**Schedule 1 of the Wildlife and Countryside Act 1981 (Sch1)** – See Wildlife and Countryside Act below. Schedule 1 lists the birds protected by the Act.

**Scheduled Monuments (SM)** – Defined as a protected archaeological site or historical building of national importance

**Scoping Opinion** – If it has been accepted that an Environmental Assessment is required for a particular form of development then the prospective applicant can seek a scoping opinion of the decision-making body to identify the type and extent of information that is required for inclusion in the Environmental Statement. Such scoping opinions are subject to consultation with relevant bodies.

**Section 41 of the Natural Environment and Rural Communities Act 2006 (S41)** – See NERC above. Section 41 covers the species of principal importance for the purpose of conserving biodiversity. These species need to be taken into consideration by a public body when performing its functions.

**Site of Nature Conservation (SNCI)** – Locally important sites of nature conservation importance adopted by Local Authorities.

**Site of Special Scientific Interest (SSSI)** – An area of special interest by reason of its flora, fauna, geological or physiographical features.

**Soil Association** – A group of soils, usually named after a geographical area in which they are found, that are similar in terms of their characteristics and how they behave in response to management.

**Soil Profile** – The column of soil usually between a depth of 0-120cm that is examined in the field assessment.

**Soil series** – An individual sub unit of the Soil Association.

**Soil structure** – The size, shape and degree of development of individual soil units, known as peds, within the soil profile.

**Sound Power Level ($L_{WA}$) –** The total amount of sound energy per unit of time generated by a particular sound source independent of the acoustic environment it is in.

**Special Areas of Conservation (SAC)** – Strictly protected sites designated under the European Commission Habitats Directive. The Habitats Directive requires the establishment of a European network of conservation sites that will make a significant contribution to conserving the habitat types and species identified in Annexes I and II of the Directive.

**Special Protection Areas (SPA)** – Areas selected in accordance with Article 4 of the European Commission Birds Directive (1979), to protect one or more rare, threatened or vulnerable bird species listed in Annex I of the Directive, and regularly occurring migratory species.

**Specific Sound Level ('site noise') –** Sound in the neighbourhood that originates from the site, i.e. the sound being assessed.

**Subsoil** – The layers of the soil profile below the topsoil and to a depth of 1.2 metres.

**Texture** – The relative proportions of sand, silt and clay in a layer of soil. This can be determined either by an experienced soil surveyor in the field by hand and be supported by laboratory analysis.

**Topsoil** – The darker, humose material usually at the surface of the land found to a depth of 20-40cm and subject to agricultural husbandry.

**Tree Preservation Order (TPO)** – An Order making by a local planning authority in England to protect specific trees, groups of trees or woodlands in the interest of amenity. An Order prohibits the cutting down, topping, lopping, uprooting, wilful damage and wilful destruction of trees without the local planning authority's written consent.

**Wildlife and Countryside Act 1981 (WCA)** – The Wildlife and Countryside Act 1981 is the primary legislation which protects animals, plants and habitats in the UK.

**Zone of Influence (Ecology) (ZoI)** - The area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities. This extends beyond the project site where there are ecological or hydrological links beyond the site boundaries.

**Zone of Theoretical Visibility (ZTV) / Zone of Visual Influence (ZVI**) – A computer-generated tool to identify the likely (or theoretical) extent of visibility of a development.