Land south of Windsor Road, Water Oakley, Bray, Berkshire, SL4 5UQ.

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

Planning Application and Environmental Impact Assessment for sand and gravel extraction and restoration by infilling at Water Oakley.

October 2018

Volume 2 Environmental Statement

Applicant:
Summerleaze Limited,
7 Summerleaze Road,
Maidenhead,
Berkshire,
SL6 8SP.

Agent:
Quarryplan (GB) Limited,
Unit 12A,
The Borough Mall,
Wedmore,
Somerset,
BS28 4EB.

Table of Contents

List of Tables included within the text of this volume

List of Figures included within the text of this volume

List of Plans included at the rear of this volume

Appendices included at the rear of this document

1.0 INTRODUCTION

1.1 Introduction to the proposals

1.1.1 This Environmental Statement accompanies a planning application submitted by Summerleaze Limited for the extraction of sand and gravel from land south of Windsor Road, Water Oakley and the restoration of the land back to agricultural use at original ground levels by infilling with inert materials. The Water Oakley site lies adjacent to the A308 Maidenhead to Windsor road near Bray in the Royal Borough of Windsor and Maidenhead (RBWM) planning authority area.

1.1.2 Sand and gravel from the site would be transported by road from the Water Oakley site along the A308 to the existing Summerleaze processing plant site at Monkey Island Lane, a distance of less than 1 kilometre (km) where it would be processed and sold.

1.1.3 The Water Oakley site has been identified as a proposed site for sand and gravel extraction in the June 2018 Joint Minerals and Waste Plan Consultation Paper prepared for the Central and Eastern Berkshire planning authorities.

1.1.4 The assessment of potential environmental effects arising from certain development projects is to be carried out as required under the Town and Country Planning (Environmental Impact Assessment) Regulations 2017. The Regulations require that prior to the grant of planning permission an Environmental Impact Assessment (EIA) is to be undertaken on large scale developments or those located in sensitive areas.

1.1.5 The responsibility for undertaking the EIA lies with the developer. The planning application to develop the Water Oakley site is in excess of 25 hectares in extent and it is mandatory that an EIA is carried out for quarry proposals of such size. In preparing the EIA Summerleaze and its technical specialists have liaised with RBWM officers and advisors including cultural heritage, environmental health, highways officers and the Environment Agency. Liaison has also been held with the local parish council, borough councillors, local businesses and with a number of local residents.

1.2 Purpose of the Environmental Statement

1.2.1 The Environmental Statement (ES) is the collation of the results of the EIA following the evaluation of the significance of the predicted environmental effects arising from the proposed development. The ES aims to provide an objective report on the potential environmental effects and is considered in a number of stages:

- A description of the baseline environmental conditions against which changes can be assessed.
- A description of the details of the proposed development.
- The identification of the potential environmental effects.
- The design of measures able to mitigate the environmental effects.
- An analysis of the effectiveness of the mitigation measures and any residual impacts.

1.2.2 The result of these stages is a detailed evaluation of the impacts of the development which should be sufficient to guide the decision maker in making the appropriate decision.

1.2.3 The matters for inclusion in an ES are outlined in the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 and can include population, fauna, flora, soil, water, air, climatic factors, material assets including architectural and archaeological heritage, landscape and the inter-relationship between these factors.

1.2.4 A number of specific environmental aspects have been identified for in-depth study based on an understanding of the development proposals, the local environment and experience preparing EIAs for similar development. The aspects include agriculture and soils, landscape and visual impact, ecology, the water regime, cultural heritage, noise, air quality, social and economic aspects, highways and public rights of way.

1.2.5 The development has also been considered in terms of alternatives, planning policy context, cumulative impacts and effects on public health, climate change and socio-economic matters.

1.3 Format of the Environmental Statement

1.3.1 The ES is designed to be a self-contained document. It is divided into three volumes:

- **Volume 1** is the Non–Technical Summary which is a simplified and shortened version of the ES. A limited number of plans are also included to explain the proposals.
- **Volume 2** is the main body of the ES **(this document)** and contains details of the site and existing environmental conditions together with plans and drawings referred to in the ES. The ES describes the proposed development, potential effects and the mitigation measures which would avoid unacceptable environmental impact on the aspects referred to above.
- **Volume 3** is also part of the ES and contains the technical assessments of the key topic areas. Volume 3 is divided into parts A and B due to the size of the technical assessments.

1.3.2 The ES has been prepared in accord with the advice contained within the government publication “Environmental impact assessment: guide to procedures”.

1.3.3 The ES consists of the following sections:

- **Introduction** which establishes the background to the project and identifies the proposals, the Applicant and EIA process.
- **Project Summary** describes the site and the proposed development.
- **Geology** outlines the geological aspects of the site.
- **Phased Working and Restoration Methodology** provides details on the extraction and restoration proposals.

- **Community Engagement** explains the work carried out with the local community and other stakeholders.
- **Scope of the EIA** identifies the environmental aspects that have been chosen for detailed assessment and the specialists responsible for the assessment work.
- **Alternatives** outlines the various alternatives considered during the design of the development.
- **Planning Framework** which considers the development against the context of national and local policies.
- **Individual Environmental Studies** considers the development in detail in terms of the various environmental aspects identified, the potential impacts and mitigating measures proposed.
- **Cumulative Impacts** examines the possible cumulative impacts in relation to other developments.
- **Public health and climate change** refers to potential impacts from the development.
- **Socio Economic** aspects are outlined in terms of employment and economic contribution.
- **Conclusion** sets out the overall conclusion of the work.

1.4 The Applicant

1.4.1 The Applicant is Summerleaze Limited, a privately owned company founded in 1928 to extract sand and gravel near Maidenhead. Today, the Company's principal gravel processing operations are located in the Thames Valley at sites in Maidenhead, Bray, Burnham and Denham. The company has also diversified into waste management and renewable energy.

1.4.2 The head office for Summerleaze is in Maidenhead at 7 Summerleaze Road, Maidenhead, Berkshire, SL6 8SP.

1.4.3 Environmental, sustainability and health and safety matters are of significant importance to Summerleaze. All developments are considered in relation to overarching corporate policies in these areas.

1.4.4 The development represents an investment of well over £2 million in the project and would result in significant annual expenditure during operations, some of which would directly benefit the local area.

2.0 PROJECT SUMMARY

2.1 Introduction

2.1.1 The Water Oakley planning application area consists of 55.36 hectares (ha) of agricultural land lying on the south side of the A308 Maidenhead to Windsor road, 4km west of Windsor and 6km south-east of Maidenhead. Extraction would be undertaken from 32.81ha of the planning application area. The site is shown on the accompanying **Location Plan** included in the Plans section at the rear of this volume and the planning application area is shown on the **Application Plan**.

2.1.2 The site is owned by Summerleaze Limited following an acquisition from Tarmac in 2010. Tarmac had owned the site for over 30 years.

2.1.3 Summerleaze promoted the Water Oakley site to the RBWM "Call for Sites" exercise in 2015 and in 2017 for consideration for sand and gravel extraction and infilling with inert waste materials to allow restoration to original ground levels and reuse for agriculture. The site has been identified for sand and gravel extraction in the June 2018 Joint Minerals and Waste Plan Consultation Paper prepared for the Central and Eastern Berkshire planning authorities.

2.1.4 Summerleaze also own an existing mineral processing plant facility at Monkey Island Lane approximately 0.5km to the north-west of the Water Oakley site which is also shown on the **Location Plan**. The Monkey Island Lane plant site has a permanent planning permission for the importation, processing and sale of sand and gravel. It has a modern and efficient processing plant and all the necessary infrastructure and associated facilities to process the sand and gravel from Water Oakley.

2.1.5 Currently sand and gravel is being extracted from the Summerleaze Taplow site approximately 4km ("as the crow flies") to the north of Water Oakley and transported to the Monkey Island Lane site for processing and sale. Sand and gravel is transported from Taplow in heavy goods vehicles (HGVs) a total distance of some 9km along the A4 and A308 roads.

2.1.6 Sand and gravel has been transported from the Taplow area to Monkey Island Lane for a number of years with sand and gravel originally being transported from an adjacent Taplow site which has been exhausted and restored to agriculture.

2.1.7 The permitted reserves of sand and gravel at the current Taplow site will be exhausted early in 2019 and consequently there is a strong desire to secure planning permission to continue the supply of sand and gravel to the Monkey Island plant.

2.2 Site and Setting

2.2.1 The Water Oakley site is roughly rectangular in shape and is bounded to the north by the A308 road, to the west by Fifield Road and to the south and east by agricultural land. The site and immediate surroundings are shown in detail on the **Current Situation** plan.

2.2.2 The River Thames is located approximately 500 metres to the north with the former mineral extraction site Eton Rowing Lake 300-400 metres beyond. The M4 motorway lies approximately 2km to the north.

Built Development

2.2.3 Built development in the vicinity of the site consists of:

2.2.4 To the immediate north an unused property known as the Guild House, the Queens Arms public house and petrol filling station. The Queens Arms also has a caravan and camping site. Further to the north between the A308 and the River Thames lies Bray Studios, Oakley Court Hotel and Down Place Farm. Numerous residential properties are located on either side of Windsor Road (A308) between 300 and 700+metres from the north-west of the site.

2.2.5 To the west a caravan park and riding stables lie on the west side of Fifield Road. Former sand and gravel extraction areas restored using household wastes lie further west with the village of Holyport lying over 1km to the west.

2.2.6 To the south-west planning permission has been granted for a gym and leisure complex. Further to the south-west lies Longlea Nursing Home and The Retreat Farm. The village of Fifield is less than 1km to the south-west.

2.2.7 There are a limited number of residential properties lying approximately 750 metres to the south of the site.

2.2.8 To the east lies Oak View Farm and an animal cemetery/crematorium between 400 and 600 metres away. Windsor Marina and a caravan park are located further to the east.

Site Description

2.2.9 The site comprises two agricultural fields bounded along the north, west, east and part of the south by a 10 metre wide planted tree screening belts which are now 15 years old and between 5 – 8 metres in height. The tree screen belts are shown on the **Current Situation** plan and create an effective visual screen between the site and external receptors during the summer and filtered views in winter.

2.2.10 Ground elevations across the site generally range between 25 and 27.5 metres above Ordnance Datum (mAOD) along the southern border and 24 to 24.5mAOD along the northern site boundary, with a very shallow undulating topographic gradient to the north.

2.2.11 The agricultural land is farmed by a local farming business under a formal farm tenancy agreement. Following mineral extraction and restoration the site would be again used for agriculture.

Designations

2.2.12 The various landscape and ecological designations in the vicinity of the site are shown on the **Landscape Designations** plan. The site lies within a large area designated as Greenbelt lying between Maidenhead, Windsor and Slough. Mineral extraction is not inappropriate development within the Greenbelt. There are no other designations within the site.

2.2.13 Within 1km of the site there are a number of listed buildings, a Site of Special Scientific Interest (Bray Pennyroyal Field), the Thames Path National Trail along the north side of the Thames and an area regarded as the Setting of the Thames.

Rights of Way

2.2.14 There are a number of public rights of way near the site including rights of way along the southern and eastern boundaries and one right of way which crosses the site from north to south as shown on the **Current Situation** plan.

Services

2.2.15 There are two agricultural irrigation water pipes which cross the site and a water main close to the western boundary. The location of these services is shown on the **Current Situation** plan.

2.3 Water Oakley Development - General

2.3.1 The site contains 1.7 million tonnes of high quality sand and gravel suitable for use as concrete aggregates after processing. It is proposed to develop the site by extracting the sand and gravel progressively in a series of phases and to restore the site back to agricultural use at original ground levels by the importation of inert infill material.

Financial investment

2.3.2 The development of the Water Oakley site represents an initial investment of over £1 million. The annual level of expenditure generated from the site whilst operational would be over £1 million per year on a variety of purchases, transport, wages, consumables, services and business rates, some of this expenditure would benefit the local economy.

Employment

2.3.3 There would be four full time jobs created on site. In addition employment at the Monkey Island Lane processing plant would be maintained and indirect or periodic employment would be provided for HGV drivers, Summerleaze support staff and various contractors providing specialist services at the site in terms construction, electrical, and earthmoving work.

Extraction proposals

2.3.4 Sand and gravel would be extracted at a rate of up to 250,000 tonnes per year and transported by HGV to the existing processing plant at Monkey Island Lane some 500

metres to the north of the Water Oakley site. Sand and gravel extraction would take 7 years to complete and would progress in a series of five phases from east to west with restoration following behind extraction. The phasing would involve the separate stripping of topsoil and subsoil before sand and gravel extraction and then infilling. Once the infill had reached final levels the subsoil and topsoil would be replaced. Wherever possible soils would be directly placed into restoration rather than stored to avoid double handling.

2.3.5 The development phases are shown on the **Block Phasing Plan.**

2.3.6 Soils would be stored in screen banks around each operational phase to minimise views of the activities and reduce noise emissions. Topsoil would be stored in banks 3 metres in height with subsoil stored in banks 4 – 5 metres high. The location of the banks around the operational phases is shown on the **Initial Development Works** plan and the accompanying five phase plans (**Phase 1, Phase 2, Phase 3, Phase 4** and **Phase 5).**

Site infrastructure

2.3.7 The initial development of the site would include the creation of a new access onto the A308 Windsor Road suitable for use by HGVs, the provision of services, site office, welfare and storage units. A weighbridge and wheelwash would also be provided. The layout of the site entrance area is shown on the **Reception Area Layout** plan and building elevations are provided on the **Office and Welfare Elevations** plan. The entrance area would be stripped of soils as part of the development of the Phase 1 works.

2.3.8 The **Initial Development Works** plan shows the extent of the site that would be developed at the commencement of the project and includes the entrance area and parts of the Phase 1 extraction area.

2.3.9 Restoration using inert infill material would commence approximately one year after sand and gravel extraction commenced. Infilling would continue for a further year following the completion of sand and gravel extraction. Restoration would be completed one year after infilling. The whole development would take a total of 10 years to complete.

Groundwater

2.3.10 In order to avoid any disturbance or impact on the local groundwater regime it is proposed to undertake measures to isolate operational areas of the site.

2.3.11 Prior to the start of mineral extraction, a permanent 10 metre thick low-permeability seal would be installed around the perimeter of each phase, extending down from ground level and keyed into the underlying London Clay. This would be constructed from site-derived overburden and would effectively isolate the mineral extraction and restoration areas from the surrounding water regime. This would prevent any significant off-site fluctuations in groundwater levels. This perimeter seal would also

form the required geological barrier which is a necessary engineering measure specified by the Environmental Permit.

2.3.12 The perimeter seal would be constructed within a linear excavation, without any significant dewatering being undertaken.

2.3.13 A permanent combined groundwater and surface water drain would be constructed progressively in stages around the eastern, northern and western perimeters of the site. The base of this drain would be connected to the underlying Kempton Park Gravel aquifer along its full length so that groundwater can flow up into this drain from below, should groundwater elevations increase significantly within the aquifer up-gradient of each quarry phase during quarrying and restoration. This would be necessary given that the lower permeability of the permanent perimeter seal and the inert infill materials used to restore the quarry void would impede groundwater flow across the application site within the Kempton Park Gravel aquifer. Infiltration of this groundwater and surface water captured by the drain can then take place into the Kempton Park Gravel aquifer where this drain extends across the unconfined part of the aquifer underlying the north-eastern and eastern (down-gradient) areas of the application site.

2.3.14 The working and restoration methodology is referred to in more detail in Section 4.

Working hours

2.3.15 The proposed working hours for the site would be limited to 0700 to 1800 hours Mondays to Fridays. There would be no extraction or infilling carried out on Saturdays, Sundays or Bank Holidays and no HGV movements. Occasional maintenance work would be undertaken on Saturday mornings between 0700 and 1300 hours.

Lighting

2.3.16 There would be no artificial illumination required in the extraction/infilling areas. Limited lighting would be required around the weighbridge, office and parking areas for pedestrian safety. Lighting units would be located at low level (less than 2 metres high) and directed/shielded to avoid light spill from the site.

Restoration

2.3.17 The restoration proposals include returning the majority of the site to agricultural use with a number of biodiversity enhancements including the gain of 2,160 metres of species rich hedges with standard oaks, 0.7ha of tree planting in field corners, 0.5ha of wildlife planting including species-rich grassland and a pond and the replacement of the track and associated grassland. There would be creation of 1,800 metres of new perimeter drain created which would be intermittently wet.

3.0 GEOLOGY

3.1 Introduction

3.1.1 The geology within and surrounding the site has been characterised by reference to British Geological Survey (BGS) publications, exploratory drilling and test pitting and previous geological and hydrogeological reports.

3.2 Site Exploration

3.2.1 The most extensive exploration was carried out in 2005 when a total of sixty five boreholes were drilled by the previous landowners Tarmac using a Dando HE 50 drill rig employing an 8-inch diameter intermittent flight auger technique. Samples were collected for analysis at 1.5 metre intervals or at changes in geological character. The locations of the boreholes are shown on the **Borehole Location Plan.** The borehole logs are included in **Appendix 1.**

3.2.2 Additional boreholes have been drilled to install piezometers and are detailed in the Hydrogeological Report contained in **Volume 3 Technical Reports.**

3.2.3 Further boreholes and test pits have been completed to provide archaeological information and details are provided in the Cultural Heritage Report in **Volume 3 Technical Reports.**

3.2.4 The aims of the drilling exercise undertaken in 2005 were to determine the detailed geology, including thickness and nature of overburden, the thickness and nature of the economic mineral deposit and the base of the deposit together with the quality of the mineral and the depth to the water table.

3.3 Detailed Geology

3.3.1 The general area is covered by BGS 1:50,000 Geological Sheet 269 Windsor. It is also covered by Mineral Assessment Report No 42 – The Sand and Gravel Resources of the Maidenhead and Marlow Area, and the BGS Memoir "London and the Thames Valley".

3.3.2 The geological succession for the site is described below which incorporates information from the BGS with detailed site investigation information derived from a series of borehole and test pitting exercises carried out over a period of years.

3.3.3 The London Clay, which forms the base of deposit, is generally flat with occasional gentle undulations. It is primarily un-weathered, and occurs in the form of firm to stiff, occasionally laminated, dark grey clay. The top of the London Clay generally lies between 20.0 – 22.0 mAOD.

3.3.4 Directly overlying the London Clay is the Kempton Park Gravel. This is a River Terrace Deposit, formed as a result of braided river systems forming across the area, depositing sand and gravel.

3.3.5 Alluvium in the form of clays and gravelly clays cover the Kempton Park Gravels and are formed by river systems. These deposits are considered uneconomic and would be treated as overburden.

Thickness of the Sand and Gravel

3.3.6 The average thickness of the sand and gravel within the extraction area is 3.0 metres, ranging from 0.2 metres in borehole BR 2005/045 to 4.9 metres in borehole BR 2005/065. The majority of the deposit is between 3 and 4 metres, with localized anomalies exceeding 4 metres. The overall mineral thickness appears to be thinning in a southerly direction and is not present in the southern part of the landholding.

Nature of Sand and Gravel

3.3.7 The sand and gravel is pale brown to orange/brown, clean to slightly silty, medium to fine/medium grained sand with an average of 65% sub-angular and sub-rounded flint and quartzite gravel.

3.3.8 Grading analysis indicates that the overall gravel/sand/silt split is 65/30/5%.

3.3.9 The unprocessed sand fraction consists primarily of fine/medium to medium grained sand.

3.3.10 The weighted average of gravel is 65% (varying from 21 to 80%). Similar amounts of 20/40, 10/20 and 4/10mm gravel exist. The gravels generally consist of sub-angular flints and sub-rounded to rounded quartzites.

3.3.11 Approximately 3% oversized material is present in the deposit, varying from 0 to 10% throughout the area. Field observations suggest the majority of oversized material to be between 50 – 60mm, occasionally 150 – 200mm clasts occur.

3.3.12 The average silt content is 5%.

3.4 Sand and Gravel Quality

3.4.1 When washed, the sand fraction of the deposit would comply with the specification for a 0/4mm concrete sand.

3.4.2 The 65% gravel is made up with 20% 20/40mm, 23% 10/20mm, 19% 4/10mm and 3% +40mm. The gravel consists predominantly of hard flint and quartzite and is considered strong and durable.

3.5 Base of Sand and Gravel Deposit

3.5.1 The base of deposit consists of dark grey, firm to stiff, occasionally laminated London Clay.

3.5.2 The overall shape of the clay base partially mirrors that of the topography, with occasional gentle undulation.

3.6 Overburden

3.6.1 The average overburden thickness is 2.1 metres and consists of the following materials in descending stratigraphic order:

- **Topsoil**: Brown to dark brown, loose soil with occasional gravel, averaging 0.4 metres in thickness. Occasionally sub-soil in form of dark brown, slightly clayey soil is present. (Where present this has been included in the average topsoil thickness).
- **Clay**: Orange brown, firm clay with occasional soft silt and sand stringers. The average thickness of this unit is 1.4 metres, varying from nil to 2.7 metres within the extraction boundary.
- **Sandy Silt**: Brown, loose silt with fine/medium sand, becoming clayey with depth. The average thickness of this unit is 0.9 metres, varying from nil to 1.6 metres.
- **Gravelly Clay**: Pale brown, firm clay with a substantial amount of fine, angular gravel. The average thickness of this unit is 0.9 metres, varying from nil to 1.5 metres. This material is not processable.

3.7 Sand and Gravel Reserves

3.7.1 The following parameters were used for the reserve calculation;

- Sand and Gravel batter slopes of 1:2.
- Overburden batter slopes of 1:1.
- Mineral density of 1.8 tonnes/m^3.
- Waste factor of 10% (silt content and wet working losses).
- 30m stand-off from A308 to the north.
- 20m stand-off to all other boundaries.

3.7.2 The calculated sand and gravel tonnage available from the extraction area amounts to 1,698,700 saleable tonnes.

4.0 PHASED WORKING AND RESTORATION METHODOLOGY

4.1 Introduction

4.1.1 The extraction and restoration of the site have been divided into a series of phases to allow a greater understanding of the activities likely to be undertaken at any one time.

4.1.2 An overview of the areas and material volumes within the proposed development is provided below with more detailed information provided on mitigation measures, individual phases and final restoration in Sections 4.2 – 4.9.

Planning Application Boundary = 55.36 hectares.

Operational Area = 38.85 hectares.
Phase 1 = 7.14ha
Phase 2 = 8.12ha
Phase 3 = 7.73ha
Phase 4 = 8.94ha
Phase 5a = 2.8ha
Phase 5b = 4.12ha

Extraction Area = 32.81ha.
Phase 1 = 5.63ha
Phase 2 = 7.67ha
Phase 3 = 7.14ha
Phase 4 = 7.2ha
Phase 5a = 2.03ha
Phase 5b = 3.14ha

Restoration Areas per Phase (32.81ha).
During Phase 1 = 3.29ha
During Phase 2 = 5.72ha
During Phase 3 = 6.94ha
During Phase 4 = 7.22ha
During Phase 5a = 6.33ha
Final Rest (Phase 5b) = 3.31ha

Volumes – Overburden = 712,000m³.
Phase 1 = 164,300m³
Phase 2 = 172,600m³
Phase 3 = 148,600m³
Phase 4 = 152,000m³
Phase 5a = 32,700m³
Phase 5b = 41,800m³

Volumes – Mineral = 1,056,400m³/1,698,700 tonnes.
Phase 1 = 163,000m³/269,000 tonnes

Phase 2 = 239,000m³/394,400 tonnes
Phase 3 = 211,000m³/348,200 tonnes
Phase 4 = 263,000m³/389,400 tonnes
Phase 5a = 71,700m³/118,300 tonnes
Phase 5b = 108,700m³/179,400 tonnes

Mineral extraction up to 250,000 tonnes per annum.
Assumed life of development.
Initial development works 1 year
Extraction 7 years
Completion of infilling 1 year
Completion of restoration 1 year
Total life = 10 years

4.2 Main Mitigation Measures

4.2.1 Potential leachate issues within the groundwater have been identified associated with the historic landfilling operations to the west of Fifield road and north of A308 Windsor Road. Due to this factor, two mitigation measures need to be implemented to prevent groundwater ingress into the site, prior to the commencement of any mineral extraction in the locality.

4.2.2 Firstly, a perimeter cut-off drain needs to be dug along the western, northern and the eastern boundaries of the site, on a phase-by-phase basis. The drain needs to be deep enough to intersect the water table to allow water to ingress into the drain and allow water to be diverted around the northern perimeter of the site eastwards thereby allowing groundwater to soakaway. The water table along the northern boundary varies between 0.5-2.0 metres below the surface. The drain to be dug would become a permanent feature, constructed with 1:2 (v/h) sides, with a 1m base width and on average some 1.5 metres deep. The drain would fall from the southwest towards the north-eastern corner of the site with gradients either following the surface landform or with a minimum fall of 1:1,000 (v/h).

4.2.3 Secondly, a clay-seal needs to be placed around the whole of the site perimeter, as well as around each phase of mineral extraction/inert waste cell. This again needs constructing on a phase-by-phase basis. This seal needs to intersect the basal clays below the mineral deposit to prevent both water ingress into and water egress from the site. The preliminary design allows for a 10 metre wide clay-seal to be placed within an excavated trench, up to some 6 metres deep. Due to the depth and height of the water table the trench would have side slopes of some 1:2 (v/h) giving rise to an excavation, on average up to some 30 metres wide. The material for the seal would be sourced from in-situ clays which lie beneath the topsoil and subsoil layers, which have been identified as both being suitable and in sufficient quantity for this purpose.

4.2.4 Additional mitigation measures during the operational period include the construction of perimeter screening bunds that are required for both noise and visual purposes. Noise bunds are required along the northern and western boundaries, varying between 3.0-5.0 metres in height. Additional visual bunds are required along the

eastern and southern boundaries being some 3.0 metres in height. The proposals allow for 3.0m high bunds to be constructed with topsoil with the remaining bunds constructed from subsoil. These bunds to be constructed on a phase-by-phase basis and would be located between the outer perimeter drain and the clay-seal trench.

4.2.5 In terms of additional visual mitigation measures, a 10 metre wide deciduous woodland screening belt was planted some 15 years ago around the majority of the northern, western and eastern boundaries, as well as a block located centrally along the southern boundary of the site. This belt is now reaching semi-maturity, being some 5-8 metres in height, providing a generally dense vegetative screen in the summer months.

4.2.6 A footpath, numbered Bray 53 that runs north-south through the eastern half of site would need temporarily diverting around the eastern boundary of the site prior to commencement of site operations. This diversion would run alongside Windsor Road to the north, linking into the route of the existing footpath that runs north-south along the eastern boundary (Bray 54), subsequently running around the southern perimeter, prior to linking in with footpath Bray 51B, that joins back into the existing route at the southern boundary where the footpath becomes Bray 53. Following final site restoration back to an agricultural afteruse, this path would be re-instated along its original route.

4.2.7 Restoration of the site would be back to original ground levels, utilising imported inert materials, based on an agricultural afteruse achieving a similar agricultural quality as currently exists. The restoration scheme also includes the provision of additional hedgerows, rough grassland alongside footpaths, areas of species rich grassland and a pond to provide additional ecological interest within the site.

4.2.8 The rate of mineral extraction and importation of inert fills are expected to be similar in volume. Therefore the rate of extraction and rate of infill would keep pace with each other minimising the amount of operational land during the development period and allowing rapid progressive restoration of the site back to an agricultural afteruse. Due to this it is expected that the majority of the soils being stripped following the initial development works would be stripped and placed as a single operation, minimising double handling of the high grade soils, as well as any possible physical degradation.

4.3 Initial Development Work (see Drawing M16.162.D.008)

4.3.1 Initial development works would commence with the construction of a new access road into the site from A308 Winsor Road to the east of Queens Acre Caravan and Camping Site adjacent to Water Oakley Farm. This access point would need to pass through the young perimeter woodland screen to gain access to the Phase 5B area of the site. Although not extracted until the end of the development period, this area would be utilised for ancillary activities including offices and weighbridge, car and lorry parking, stocking and waste reception throughout the life of the development. In addition, part of the area would also be used to accommodate temporary topsoil and subsoil storage bunds.

4.3.2 The cut-off drain would initially be excavated along the eastern, northern and western boundaries of these areas inside the perimeter woodland screen to the specification as described above. An easement strip/access track would also be provided adjacent to the drain to allow for subsequent maintenance. Soils would subsequently be stripped from Phase 5B and around the full perimeter of Phase 1 in preparation for excavating the clay-seal trench. The excavated topsoil and subsoil would be placed separately along the outer perimeter of these phase boundaries inside the cut-off drain, including the southern boundary of Phase 1 to act as an additional visual screen. Trenches would then be progressively excavated within the mineral deposit and backfilled utilising the clays below the soil horizon. These clays would be placed to some 1.2 metres below final ground levels to allow for subsequent re-spreading of soils to achieve agricultural restoration later in the development.

4.3.3 It is expected that this phase of the operations would last for some 12 months and would disturb up to 11.3 hectares of land. All undisturbed land would remain in agricultural production during this period.

4.3.4 During this stage of the operation a small pond would be created in the southeastern corner of the site, plus management and seeding works on adjacent land to create an area of species rich grassland.

4.4 Phase 1 (see Drawing M16.162.D.009)

4.4.1 During the progressive construction of the perimeter clay-seal around the Phase 1 extraction and infill area, mineral would also be progressively excavated from the remainder of this Phase. Following completion of the full perimeter clay-seal, inert materials would then be allowed to be tipped into the extracted void to commence infilling to restore the area back to original ground levels, subject to an environmental permit from the Environment Agency.

4.4.2 When a sufficient area has been backfilled with inert material to formation levels, subsoil and topsoil from future working areas and adjacent soil bunds would be placed progressively to an average depth of 1.2 metres to restore this area back to an agricultural afteruse.

4.4.3 During the main extraction and subsequent infilling stage of this phase, construction works would also take place within future operational areas to progressively extend the perimeter drain along the northern boundary of Phase 3; excavate trenches within the mineral deposit to extend the perimeter clay-seal around the Phase 2 extraction area; extend soil bunding along the northern and southern boundary of the site for noise and visual mitigation purposes. All undisturbed land would remain in agricultural production during this period.

4.4.4 During this and the initial development stage of the operation, some 206,000m³ of soils and overburden would be stripped and some 293,000 saleable tonnes of mineral would be excavated. It is expected that mineral extraction during this phase of the operations would last for some 14 months, at the end of which up to some 3.3 hectares of land would have either been restored or nearing completion.

4.5 Phase 2 (see Drawing M16.162.D.010)

4.5.1 During the progressive construction of the perimeter clay-seal around the Phase 2 extraction and infill area, mineral would also be progressively excavated from the remainder of this Phase. Following completion of the full perimeter clay-seal around Phase 2 and infilling of Phase 1, inert materials would then be tipped into the extracted void of Phase 2 to commence infilling to restore this area back to original ground levels.

4.5.2 Following completion of infilling with inert materials within Phase 1 to formation levels, subsoil and topsoil from both future working areas and adjacent soil bunds would be placed progressively to an average depth of 1.2 metres to restore this area back to an agricultural afteruse. The progressive nature of infilling, soiling and restoration to agriculture would continue into Phase 2.

4.5.3 During the main extraction and subsequent infilling stage of this phase, construction works would also take place within future operational areas to progressively extend the perimeter drain along the northern and western boundary of Phase 4; excavate trenches within the mineral deposit to extend the perimeter clay-seal around the Phase 3 extraction area; extend soil bunding along the northern, southern and western boundaries of the site for noise and visual mitigation purposes. All undisturbed land would remain in agricultural production during this period.

4.5.4 During this stage of the operation, a further 8.2 hectares of land would be disturbed, some 173,000m³ of soils and overburden would be stripped and some 430,000 saleable tonnes of mineral would be excavated. It is expected that mineral extraction during this phase of the operations would last for some 21 months, at the end of which a further 5.7 hectares of land would have either been restored or nearing completion.

4.6 Phase 3 (see Drawing M16.162.D.011)

4.6.1 During the progressive construction of the perimeter clay-seal around the Phase 3 extraction and infill area, mineral would also be progressively excavated from the remainder of this Phase. Following completion of the full perimeter clay-seal around Phase 3 and infilling of Phase 2, inert materials would then be tipped into the extracted void of Phase 3 to commence infilling to restore this area back to original ground levels.

4.6.2 Following completion of infill with inert materials within Phase 2 to formation levels, subsoil and topsoil from both currently undisturbed areas and adjacent soil bunds, including some of the soils stored within the area of Phase 5B, would be placed progressively to an average depth of 1.2 metres to restore this area back to an agricultural afteruse. The progressive nature of infilling, soiling and restoration to agriculture would continue into Phase 3.

4.6.3 During the main extraction and subsequent infilling stage of this phase of the development, construction works would also take place within future operational areas to progressively excavate trenches within the mineral deposit to extend the

perimeter clay-seal around the Phase 4 extraction area. All undisturbed land would remain in agricultural production during this period.

4.6.4 During this stage of the operation, a further 7.7 hectares of land would be disturbed, some 149,000m³ of soils and overburden would be stripped and some 380,000 saleable tonnes of mineral would be excavated. It is expected that mineral extraction during this phase of the operations would last for some 18 months, at the end of which a further 6.9 hectares of land would have either been restored or nearing completion.

4.7 Phase 4 (see Drawing M16.162.D.012)

4.7.1 During the progressive construction of the perimeter clay-seal around the Phase 4 extraction and infill area, mineral would also be progressively excavated from the remainder of this Phase. Following completion of the full perimeter clay-seal around Phase 4 and infilling of Phase 3, inert materials would then be tipped into the extracted void of Phase 4 to commence infilling to restore this area back to original ground levels.

4.7.2 Following completion of infill with inert materials within Phase 3 to formation levels, subsoil and topsoil from both currently undisturbed areas and adjacent soil bunds, including those stored within the area of Phase 5B, would be placed progressively to an average depth of 1.2 metres to restore this area back to an agricultural afteruse. The progressive nature of infilling, soiling and restoration to agriculture would continue into Phase 4.

4.7.3 During the main extraction and subsequent infilling stage of this phase of the development, construction works would also take place within future operational areas to progressively excavate trenches within the mineral deposit to extend the perimeter clay-seal around the Phase 5A extraction area. All undisturbed land would remain in agricultural production during this period.

4.7.4 During this stage of the operation, a further 8.9 hectares of land would be disturbed, some 152,000m³ of soils and overburden would be stripped and some 474,000 saleable tonnes of mineral would be excavated. It is expected that mineral extraction during this phase of the operations would last for some 23 months, at the end of which a further 7.2 hectares of land would have either been restored or nearing completion.

4.8 Phase 5 (see Drawing M16.162.D.013)

4.8.1 Following completion of the full perimeter clay-seal around Phase 5A and infilling of Phase 4, inert materials would then be tipped into the extracted void of Phase 5A to commence infilling to restore this area back to original ground levels. During this period mineral would also be progressively extracted from Phase 5B to complete mineral extraction.

4.8.2 Following completion of infill with inert materials within Phase 4 to formation levels, subsoil and topsoil from adjacent soil bunds would be placed progressively to an average depth of 1.2 metres to restore this area back to an agricultural afteruse. The

progressive nature of infilling, soiling and restoration to agriculture would continue into Phase 5A and subsequently into Phase 5B.

4.8.3 During this final stage of the operation, a further 2.0 hectares of land would be disturbed, some 33,000m³ of soils and overburden would be stripped and some 325,000 saleable tonnes of mineral would be excavated. It is expected that mineral extraction during this final phase of the operations would last for some 16 months, at the end of which a further 9.6 hectares of land would have either been restored or nearing completion.

4.9 Restoration Concept (see Drawing M16.162.D.014)

4.9.1 Following completion of all soiling within Phase 5, final site restoration works would be undertaken, including hedgerow planting, small woodland planting in field corners and re-instatement of footpath numbered Bray 53 along its original route, including areas of adjacent rough grassland. The new site entrance onto A308 Windsor Road would be retained, although downgraded to a farm access track.

4.9.2 Some of the final field boundaries could be planted progressively throughout the development period. However, the ability to undertake these works would be subject to agricultural aftercare and land management constraints, including underdrainage works and the construction of field drains and outfalls linking into the perimeter drain, where required.

4.9.3 The restoration proposals include returning a large part of the site to agricultural use with a number of biodiversity enhancements including the gain of 2,160 metres of species rich hedges with standard oaks, 0.7ha of tree planting in field corners, 0.5ha of wildlife planting including species-rich grassland and a pond and the replacement of the track and associated grassland. There would be creation of 1,800 metres of new perimeter drain created which would be intermittently wet.

5.0 COMMUNITY AND STAKEHOLDER ENGAGEMENT

5.1.1 In preparing the EIA Summerleaze and its technical specialists have liaised with RBWM advisors over environmental health and highways matters as well as a number of planning consultees such as Berkshire Archaeology and the Environment Agency.

5.1.2 Liaison has also been held with the local community by way of discussions with parish and borough councillors, local businesses and with a number of local residents.

6.0 SCOPE OF THE ENVIRONMENTAL IMPACT ASSESSMENT

6.1 Introduction

6.1.1 Establishing the extent of the scope of an EIA forms an important part of the overall process. The scope of the EIA was developed by Quarryplan and Summerleaze in consultation with the various specialist consultants engaged in the project.

6.1.2 It would be normal practice to submit a formal Scoping Request to RBWM and seek guidance on the issues to be included in the EIA. Unfortunately, previous experience in 2016 with a Scoping Request to RBWM for an EIA for the Poyle mineral and waste development in Colnebrook, resulted in a delay of over 12 months before a Scoping Opinion was issued and furthermore the Scoping Opinion contained no additional requirements beyond those already planned for the EIA. It was decided that a similar delay waiting for a formal Scoping Opinion for Water Oakley was not acceptable.

6.2 Scope of the Environmental Impact Study

6.2.1 The "matters for inclusion" in an EIS are outlined in the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the 2017 Regulations).

6.2.2 The Schedule requires:

"A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.

6.2.3 This EIA considers the potential significant effects and consequences on the environment of the development and assesses whether such effects are:

- Direct or indirect
- Short, medium or long-term
- Reversible or irreversible
- Beneficial or adverse

6.2.4 Where significant adverse effects are identified a description of the measures necessary to avoid, reduce or remedy these effects is provided (mitigation measures).

6.2.5 To determine the environmental aspects that should be addressed within this EIA, each of the main activities within the development were considered and potential impacts arising from those activities were identified in a Scoping Schedule. The Scoping Schedule is reproduced below as **Table 6.1**.

Topic	Potential Impact	EIA Proposals
Geology	Sand and gravel sterilisation.	The quarry design would seek to recover the optimum amount of sand and gravel.
Soils and Agriculture	Loss of agricultural land. Loss or damage to soil resource. Effect on farming unit. Land restoration and afteruse.	The land quality and soil resources would be determined. Proposals for removal, storage and reuse of soils would be assessed. Farm business impact would be considered.
Archaeology and Cultural Heritage	Loss or damage to buried archaeology. Impact on historic buildings and settings. Cumulative impacts.	A full desk study would be carried out to determine the archaeological value of the extension area. Historic and listed buildings would be considered. Further phases of site investigation would be carried out as appropriate.
Landscape and Visual Impact	Disturbance to landscape character and quality. Disturbance to visual amenity. Restoration impacts.	A landscape study would assess the significance of impacts on the landscape. Viewpoint analysis would determine the level of impacts from individual locations.
Ecology	Loss or damage to habitat. Loss or damage to species. Results of restoration.	An extended phase 1 survey of the site and adjacent area to identify habitats and species that required further study. Additional species surveys would be undertaken as required.
Water Regime	Effects on surface and groundwater quality and quantity. Impacts on historic landfills. Change to flood regime.	The existing water regime would be assessed together with potential impacts arising from the development to receptors and water resources in the area.
Noise	Disturbance to local residents. Effect on amenity. Effect on ecology.	Survey would determine existing noise levels and predicted noise levels from the development at the closest noise sensitive receptors.
Air Quality	Disturbance to local residents. Effect on amenity. Effect on ecology.	Assessment would establish existing air quality and predicted emission levels at the closest sensitive receptors.
Highways and Public Rights of Way	Impact on local road network. Impact on public rights of way.	The highways implications of vehicles using the A308 would be determined in terms of capacity and safety. Impacts on public rights of way would be assessed.

Table 6.1 Scoping Schedule

6.2.6 The 2017 Regulations focus upon the "significant effects of a development"; these elements need to be assessed in detail whereas other issues, with less significance, may require a brief investigation.

6.2.7 The environmental elements chosen for the most detailed scrutiny are listed below together with the consultants who carried out the work:

- **Agriculture and Soils – Richard Stock**
- **Air Quality – Vibrock Limited**
- **Cultural Heritage – John Moore Heritage Services**
- **Ecology – Ward Associates**
- **Highways – Hurlstone Partnership**
- **Landscape Character and Visual Appraisal – Pleydell Smithyman Limited**
- **Noise – WBM**
- **Planning Context – Quarryplan**
- **Public Rights of Way – Quarryplan**
- **Water Regime – SLR Consulting**

6.2.8 Reports prepared by the consultants are included in **Volume 3**. The reports consider the following:

- Baseline study
- Identifying potential impacts
- Predicting and evaluating the magnitude and significance of impacts
- Proposing mitigation measures
- Assessing the residual effects

6.2.9 In addition impacts on public health, climate change and socio-economic matters was also considered.

6.2.10 The remit of the EIA is to consider all environmental aspects which could experience impact from the proposed development and to identify mitigation measures which could amend or reduce the level of impact to acceptable levels.

7.0 ASSESSMENT OF ALTERNATIVES

7.1 Introduction

7.1.1 The 2017 Regulations state that an outline of the main alternatives studied by the applicant should be included within Environmental Statements. Government Circular DETR 02/99 makes clear that this is not a strict requirement of an ES, but that it is good practice.

7.1.2 Consideration of alternative sites, construction practices, plant and equipment, operating practices and site layouts should be considered, where appropriate, including the main reasons for the choice, taking into account the environmental effects. The advantages and disadvantages of each option should be clearly stated. The main reasons for the selection of the preferred option should be described in outline, taking into account the environmental effects. Other influencing factors should also be noted, including feasibility, cost effectiveness and reasonableness.

7.1.3 There are a number of alternatives which have been considered during the preparation of the ES. The range of options are listed below and commented on in more detail subsequently:

- No development option.
- Alternatives to extraction at the Water Oakley site.
- Alternative methods of extraction and processing.
- Alternative methods of transportation.
- Alternative restoration.

7.2 No Development Option

7.2.1 It is advised as good practice that the 'no development' option is taken into account and utilised as a comparable, in environmental impact terms, to the proposed development scheme.

7.2.2 The 'no development' option would result in no impacts on the local environment from the development of the Water Oakley site, however there would be consequences for the operation of the Monkey Island Lane processing plant. Once the reserves of sand and gravel at the current Taplow site are exhausted the Monkey Island Lane plant site would either cease operating or would need to import sand and gravel from further afield, probably from the Summerleaze site in Maidenhead.

7.2.3 Ceasing the processing of sand and gravel through the Monkey Island Lane plant site would have a considerable impact of the Summerleaze business. The capital invested in the site would not be utilised and there would be a loss of employment for plant staff and HGV drivers. In addition a high quality construction aggregate would not be available to the local construction market and alternative sources would be needed.

7.2.4 The Summerleaze Maidenhead site has planning permission to extract sand and gravel although the site is not operational at the present time. Importing sand and gravel

from the Summerleaze Maidenhead site to the Monkey Island Lane plant site would allow the plant site to continue operating and would maintain employment levels. However, the transportation of sand and gravel from Maidenhead would require HGVs to travel through Maidenhead and along the A4 and A308 roads to reach the Monkey Island Lane plant site a distance of approximately 8km (5 miles). In comparison the Water Oakley site is over 4 miles closer to the plant site being only 0.75km (0.5 miles) away.

7.2.5 The savings in HGV road miles would be significant, almost 700,000 HGV road miles during the life of the Water Oakley site. This figure is based on a saving of approximately 8 miles per HGV load (4 miles between the sites with the HGV fully loaded and 4 miles unloaded). The reduction in fuel use, carbon footprint, engine emissions, road use and traffic would be considerable.

7.3 Alternatives to extraction in the Water Oakley site

7.3.1 The Summerleaze Maidenhead site is not operational and has no on-site processing facilities. The development of this site would result in the Monkey Island Lane plant site being unused unless the sand and gravel was transported to Monkey Island Lane for processing and sale. Developing a new processing plant at Maidenhead would require considerable capital investment and is unnecessary because there is a suitable facility already at Monkey Island Lane.

7.3.2 The consideration of other alternative sites for mineral development is limited as minerals can only be worked where they occur geographically. 'Preferred Areas' for mineral workings are identified in Minerals Plans in order to provide some guidance to developers and local residents on areas where planning permission could potentially be granted for mineral extraction.

7.3.3 The Water Oakley site has been identified as a proposed site for sand and gravel extraction in the June 2018 Joint Minerals and Waste Plan Consultation Paper prepared for the Central and Eastern Berkshire planning authorities which include RBWM.

7.4 Alternative methods of extraction and processing

7.4.1 The methods of extraction proposed at the site are well established and include the usual operations carried out at sand and gravel quarry sites.

7.4.2 There is little in the way of alternatives to the proposed method of extraction.

7.4.3 Processing is proposed at Monkey Island Lane where there is an existing efficient processing plant with all the necessary infrastructure and silt disposal facilities required to process the sand and gravel into a series of high quality aggregates. The establishment of a new processing plant at Water Oakley would require considerable capital investment and could introduce unwanted environmental impacts. A substantial supply of water would be needed for processing and a series of silt disposal lagoons would be required to accommodate the silt washed from the sand and gravel.

The silt lagoons would not readily be restored back to agricultural land and therefore there would be a loss of good quality farmland.

7.4.4 Alternative extraction design within the site has been considered in terms of phasing and direction of working and the location of soil/overburden banks.

7.4.5 The proposed extraction design has been determined following consideration of potential environmental issues such as visual, noise and dust impacts. The phasing and direction of working provides mitigation of potential environmental impacts whilst meeting operational and legislative requirements.

7.4.6 Topsoil, subsoil and overburden material, which would be stripped from the site in phases to allow access to the underlying mineral, would be directly placed into restoration or placed in storage bunds around operational areas until such time as the material is required for restoration purposes. The locations of soil storage bunds have been carefully considered in order to reduce the transportation distance; minimise double handling of soils; minimise any potential damage to the soil resource; minimise any potential impacts to sensitive receptors as a result of soil stripping, moving and construction of soil bunds.

7.4.7 Soil storage bunds can be sensitively located and constructed to provide mitigation in terms of potential visual, noise and dust impacts. The exact size, height and location of such mitigation bunds have been determined through a process involving ecological, amenity, agricultural and operational considerations, but driven by visual impact requirements and noise mitigation.

7.5 Alternative methods of transportation

7.5.1 The distance between the Water Oakley and Monkey Island Lane sites is relatively small and a conveyor has been considered to transport sand and gravel rather than HGVs.

7.5.2 A new site access into the Water Oakley site from the A308 would still be required for the inert infill HGVs and therefore the use of a conveyor would not remove the need for a new HGV access.

7.5.3 A bridge would be required to take the conveyor over the A308 because a tunnel beneath the A308 would not be feasible due to the high water table. The conveyor bridge would be a substantial and expensive structure that would create landscape and visual impacts.

7.5.4 Similarly a second bridge may be required over Monkey Island Lane to access the plant site for the same reasons.

7.5.5 A vehicular access would be required alongside the conveyor for installation, maintenance and decommissioning.

7.5.6 The conveyor route would need to cross the Bray Pennyroyal Field SSSI which lies between the two sites and is already in "unfavourable, recovering" state. The conveyor may have further impact.

7.5.7 The route of a conveyor between the two sites would cross a number of third party land ownerships. There is no certainty that an affordable agreement could be reached with the various landowners regarding the installation of a conveyor or if an agreement could be reached at all.

7.5.8 It is considered that a conveyor is not a realistic or feasible alternative to the use of HGVs.

7.6 Alternative restoration

7.6.1 The proposed restoration of the site would ensure that there was no substantial long term loss of productive agricultural land. The restoration scheme would also result in biodiversity enhancement in terms of additional hedgerows and tree planting, rough grassland, conservation grassland, a small pond and open drains.

7.6.2 The site could be restored to a landscaped lake or series of lakes without infilling back to agricultural land, however the site lies within the Airfield safeguarding zone for Heathrow Airport and large open water bodies would not be acceptable. The complete loss of high quality agricultural land could not be justified.

7.6.3 The site could be partly infilled but this would only result in large shallow water bodies or marsh areas and would still result in difficulties with Airfield Safeguarding and the loss of farmland.

7.7 Conclusion

7.7.1 Summerleaze believe that the proposals put forward, having taken into account the options discussed above and the advice of the specialist consultants, are the most appropriate in environmental terms for the site and for the local area.

8.0 PLANNING AND DEVELOPMENT CONTEXT

The full-length version of the Planning Assessment is included in the Environmental Statement (Technical Studies) in Volume 3.

8.1 Author of the Report

8.1.1 The Planning and Development assessment was prepared by Quarryplan, a multi-disciplinary consultancy with extensive experience within the aggregates, cement, industrial minerals, energy minerals, building products and mining sectors. Quarryplan is particularly familiar with mineral extraction and processing operations and the preparation of planning applications for these operations.

8.1.2 Chris Tinsley is the author of the report. Chris is a Senior Town Planning Consultant at Quarryplan Ltd with over 5 years' experience working within the planning and development industry. Chris is a full member of the Royal Town Planning Institute (RTPI).

8.2 Introduction

8.2.1 The accompanying planning policy assessment has been prepared in association with a full planning application by Summerleaze Ltd ('the applicant') which seeks permission for sand and gravel extraction and restoration to agricultural use at land to the south of A308, Water Oakley, Windsor.

8.2.2 The statement provides an assessment of the relevant planning policy issues and shows that the proposed development can proceed in a sustainable manner and that any limited impacts of the development would not outweigh the benefits.

8.3 Site Description and Planning History

8.3.1 The application site is located approximately 5.5 kilometres (km) to the west of Windsor Town Centre and 4.5km to the south east of Maidenhead Town Centre in the Royal Borough of Windsor and Maidenhead (RBWM).

8.3.2 The site is bounded to the north by Queens Acre Caravan and Campsite and the A308. The site is bound to the west by Guild House and Fifield Road. The site is surrounded by agricultural land to the south and east. The site is located approximately 500m to the south of the Applicant's current processing facility at Monkey Island Lane.

8.3.3 The application area amounts to some 57.4ha. The site is irregular in shape and consists of agricultural fields. According to the RBWM Public Access system, the site has not been the subject of any previous planning applications.

8.3.4 The site is located within a Green Belt designation. The site is not the subject of any other statutory or non-statutory designations. There are no Listed Buildings or scheduled monuments within or adjacent to the application site. The site is within Flood Risk Zone 1 (lowest risk of flooding).

8.4 Proposed Development

8.4.1 The planning application seeks consent for extraction of sand and gravel at the site with full restoration to agriculture.

8.4.2 The proposed development seeks permission for the removal of 1.7 million tonnes of sand and gravel from the application site. The site would be worked in phases, from east to west.

8.4.3 Extraction includes recovery of sand and gravel from below the water table although no dewatering or discharge of water from the site is to be carried out.

8.4.4 No processing plant is proposed at the application site with all material being processed off-site. Extracted material would be transported via Heavy Goods Vehicle (HGV) to the applicant's processing plant site and Monkey Island Lane, approximately 500m to the north of the application site.

8.4.5 The processing plant site at Monkey Island Lane benefits from planning permission for the importation, processing and exportation of sand and gravel.

8.4.6 Following the completion of works, the site would be fully restored to agricultural use at original ground level. In order to deliver a beneficial afteruse, infill material would be imported to the site, providing an important facility for the deposition of inert material resultant from local construction projects.

8.4.7 The application site is anticipated to be infilled at a rate of 250,000 tonnes per annum. The proposed restoration scheme would include the provision of species rich and rough grassland. The public right of way which runs through the site would be reinstated with new hedgerows and gates installed along the route. The restoration proposals would allow the site to assimilate back in to the local landscape.

8.4.8 The proposed development would generate employment for 4 full time staff. The proposed development would also help to sustain existing employment at the Monkey Island Lane Processing site. The development of the site would result in an annual expenditure of over £1 million on the likes of purchases, transport, wages, consumables, services, and business rates. This expenditure would directly and indirectly benefit the local economy.

8.5 Planning Policy Framework

8.5.1 Section 38(6) of the Planning and Compulsory Purchase Act 2004 requires that an application for planning permission shall be determined in accordance with the development plan. In this case the Statutory Development Plan comprises the policies of the Replacement Minerals Local Plan (RMLP) for Berkshire which were saved by a direction of the Secretary of State (Adopted 1995 with alterations adopted in 1997 and 2001, Policies saved 2007).

8.5.2 The saved policies of the RMLP that are consistent with the National Planning Policy Framework (NPPF) and the NPPF itself are considered to be the primary planning policy considerations in the determination of the application.

8.5.3 Other material policy considerations include the emerging Central and Eastern Berkshire Draft Joint Minerals and Waste Local Plan (June, 2018) (CEBJMLP) and guidance provided by the National Planning Practice Guidance (NPPG, March 2014).

Replacement Minerals Local Plan (RMLP) for Berkshire (1995)

8.5.4 The RMLP was adopted by Berkshire County Council in 1995. This plan was produced jointly by the unitary authorities that make up the former Berkshire County area, including RBWM. The Plan was first adopted in 1995 with alterations adopted in 1997 and 2001. The policies referred to in this section are policies that remain 'saved' following a direction from the Secretary of State in 2007. The saved policies which relate to the RBWM will eventually be replaced by policies within the CEBJMLP.

8.5.5 The north-western part of the application site is identified on the adopted Proposals Map as being located within an area identified as "All other Sand and Gravel Deposits (Policies 8, 10, 12 and 14)".

8.5.6 Policies 8, 12 and 14 are not applicable to the proposed development, however, Policy 10 is applicable.

8.5.7 Policy 10 relates to areas, as shown on the adopted Proposals Map, which are outside of those areas identified as Preferred Areas for the extraction of sharp sand and gravel. The policy states that applications for extraction in these areas will normally be refused. In considering whether to make an exception, the policy states that the Local Authority will take account of whether there is a need to disturb land outside of the Preferred Areas, whether the need could be more acceptably met elsewhere and whether the proposals can overcome all of the considerations as set out in Policy 7.

8.5.8 The latest Local Aggregate Assessment requirement of 7,520,380 tonnes of sharp sand and gravel to be provided during the plan period up to the year 2036.

8.5.9 The Preferred Areas as identified on the Proposals Map, were identified in 1995, the allocations are therefore over 20 years old. Even if all the remaining Preferred Areas came forward for development, this still would not fully meet the future demand for Central & Eastern Berkshire. As a result, there is a clear and demonstrable need to develop land outside of the Preferred Areas.

8.5.10 Policy 7 lists a number of criteria for assessing sand and gravel proposals including impacts upon amenity, traffic, ecology, landscape, hydrology and public rights of way. The assessment demonstrates how the proposals would accord with this policy.

8.5.11 The proposed development is considered to accord with the provisions of the RMLP.

Emerging Central and Eastern Berkshire Joint Minerals and Waste Plan (2018)

8.5.12 The Central & Eastern Berkshire Authorities are working in partnership to produce a Joint Minerals & Waste Plan (CEBJMLP) which will guide minerals and waste decision-making in the Plan area for the period up to 2036.

8.5.13 The Plan has not yet undergone public examination; however, it may be afforded some weight in the decision-making process, in accordance with the provisions of the NPPF.

8.5.14 The application site is identified within the emerging Plan as a draft allocation for sand and gravel extraction.

8.5.15 Draft Policy M4 relates to the location for future sand and gravel extraction within the Plan area and states that:

"A steady and adequate supply of locally extracted sand and gravel will be provided by… (3) The allocation of the following sand and gravel sites… Water Oakley, Holyport".

8.5.16 The text which accompanies the Water Oakley allocation states that considerations should be given to ecology; landscape and townscape; historic environment; transport; waster environment and flood risk and cumulative impacts.

8.5.17 All of the above considerations have been thoroughly considered and assessed within the accompanying ES. The conclusion of which, is that the proposed development would not result in any significant effects upon the environment.

8.5.18 Given the inclusion of the draft allocation within the Plan, the principle of sand and gravel extraction at the site is considered to be acceptable.

8.5.19 The draft policies of the CEBJMLP relate to a range of topics including climate change, biodiversity, landscape, historic environment. The accompanying planning policy report demonstrates that the development accords with the draft policies.

National Planning Policy Framework

8.5.20 The NPPF was adopted by the Government in July 2018.

8.5.21 The assessment demonstrates how the proposed development accords with the economic, environmental and social objectives of sustainable development. The report also demonstrates how the proposals accord with the provisions of the NPPF in respect to a number of typical development considerations, all of which are also addressed within the assessment of the RMLP and the CEBJMLP.

8.5.22 Paragraph 143 of the NPPF states that inappropriate development is, by definition, harmful to the Green Belt and should not be approved except in very special circumstances.

8.5.23 Paragraph 146 states that certain other forms of development are not inappropriate in Green Belt provided they preserve the openness of the Green Belt and do not conflict

with the purposes of including land in Green Belt. One such use as identified within the policy is mineral extraction.

8.5.24 The proposed development is considered to accord with the provisions of the NPPF in relation to Green Belt.

8.5.25 The NPPF sets out a number of considerations specifically in relation to minerals development, placing great weight on the benefits of mineral extraction. The report demonstrates that the development would create an acceptable balance between achieving economic benefits and protecting the environment.

National Planning Practice Guidance (March 2014)

8.5.26 The National Planning Practice Guidance (NPPG) provides detailed guidance notes to be used by applicants when preparing planning applications and for LPA's in determining planning applications. Where any technical guidance is provided in relation to a particular consideration (e.g. noise) this guidance is included and addressed within the accompanying ES. As a result, the proposed development is considered to be in accordance with the guidance in relation to minerals development as set out within the ES.

8.6 Conclusions

8.6.1 A Planning Policy Report has been prepared to provide an assessment of the relevant planning policy issues in relation to the proposed sand and gravel extraction and restoration to agricultural use at land to the south of A308, Water Oakley, Windsor.

8.6.2 The aim of both national and local mineral planning policy is to achieve a balance between the economic benefits associated with the development and the potential environmental effects.

8.6.3 The assessment of the potential effects of the development are provided within the accompanying ES.

8.6.4 The proposed development has been assessed against of prevailing local and national planning policy.

8.6.5 The accompanying Planning Policy Report demonstrates that development is required outside of the preferred areas identified in the adopted RMLP.

8.6.6 The RMLP is outdated and the application site is identified as a draft allocation for the extraction of sand and gravel in the emerging CEBJMLP. The principle of sand and gravel extraction is therefore considered acceptable at the site.

The site is located within a Green Belt designation. This report has demonstrated that the development would accord with Green Belt policy as set out in the NPPF and would not constitute an inappropriate form of development within the Green Belt.

8.6.7 The proposed development has been demonstrated to accord with the three objectives of sustainable development as set out in the NPPF and with the specific policies as set out within the RMLP and the CEBJMLP.

8.6.8 There are not considered to be any other material considerations which would indicate that the proposals are unacceptable. The benefits of the development have been demonstrated to far outweigh any minor impacts and as a result, the report concludes that there are no planning policy reasons as to why the proposed development should not proceed.

9.0 AGRICULTURE AND SOILS

The full-length version of the Agriculture and Soils Assessment is included in the Environmental Statement (Technical Studies) in Volume 3.

9.1 Author of the report

9.1.1 The agricultural impact assessment has been prepared by Richard Stock who holds an honours degree in Agricultural Science and a diploma in Soil and Water Engineering and is a member of the Institute of Agricultural Engineers.

9.1.2 Richard has worked in association with the minerals and water industries since 1979 for statutory, commercial and consultancy organisations. He has been an Independent Consultant since 1998.

9.2 Introduction

9.2.1 The assessment presents the Baseline information regarding Agricultural Land Classification and Soil Resource information and considers the National Planning Policy Framework and the Replacement Berkshire Minerals Plan. In the absence of a Scoping Opinion it considers the development proposals and the potential impacts on soils in respect of a number of issues, mainly relating to loss of agricultural land and land quality, identifies mitigation measures and the impacts after mitigation. These are issues which Natural England consistently raise as matters to be addressed in mineral planning developments and reflect the NPPF policies.

9.2.2 For topic areas within the EIA, the significance of the impact is frequently assessed by the Magnitude of the effect and the Quality/Value or Sensitivity of the resource being affected. For Soils and Agriculture there is no universally accepted methodology. In the absence of approved methods for assessing significance criteria in respect of loss of Agricultural Land and impact on Farm Businesses, it is proposed to use criteria, which are commonly used, noting that the criteria relate to the loss of agricultural land rather than temporary disturbance.

9.2.3 The design of the working and restoration scheme for the development has been an iterative process and most of the mitigation measures are incorporated into the development proposals.

9.3 Baseline

9.3.1 Baseline information relating to the agricultural land quality and soil resources of the site is mainly based on two detailed surveys of the application area, which were undertaken by the Ministry of Agriculture, Fisheries and Food (MAFF, now Defra) between 1991 and 1993. The Agricultural Land Classification (ALC) and Soil Resource Report for the site, which is presented as an appendix to the assessment, is a consolidation of the two MAFF surveys, which were prepared in response to requests by Berkshire County Council in connection with the Berkshire Minerals Plan.

9.3.2 The ALC and Soil Resource Report shows that the application area of 55.36 hectares comprises land in grades 2, 3a and 3b, although much of this area would be largely undisturbed. The operational area extends to 38.85 hectares, of which mineral is only extracted from 32.81 hectares. The distribution of ALC grades is shown in **Table 9.1** below.

Agricultural Land Grade	**Application Area**		**Operational Area**	
	Ha	%	Ha	%
2	22.36	40.39	21.32	54.88
3a	7.09	12.81	3.12	8.03
3b	23.41	42.29	11.91	30.66
n/a	2.5	4.51	2.5	6.43
Total	55.36	100	38.85	100

Table 9.1 Land Grade Distribution

9.3.3 The soil resources are shown to extend to a depth of 1.2m and consist of two main soil types, which are identified in the schedule of auger borings transcribed from the MAFF soil data sheet.

9.3.4 The topsoil is typically medium textured soil (medium clay loam and sandy clay loam) and occurs to an average depth of 32cm. The upper subsoil in Soil Type 1 is also medium textured (medium clay loam and sandy clay loam), which overlies heavy textured lower subsoil (sandy clay and clay). The upper subsoil in Soil Type 2 is heavy textured (heavy clay loam, clay and sandy clay), which usually persists to 1.2m deep, but occasionally gives way to medium textured lower subsoil.

9.3.5 The two soil types are summarised in **Table 9.2** below. It is recommended that that the medium and heavy textured topsoil and subsoils are handled separately and restored in discrete field parcels.

Layer	**Depth (cm)**	**Type 1 (T1)**	**Type 2 (T2)**
Topsoil	0-32	medium clay loam and sandy clay loam	medium clay loam, sandy clay loam and very occasionally heavy clay loam
Upper subsoil	32-72	medium clay loam and sandy clay loam	heavy clay loam, clay and sandy clay

Lower subsoil	72-120	clay and sandy clay	medium clay loam and sandy clay loam (this lower subsoil layer rarely occurs)

Table 9.2 Soil Type summary

9.4 Proposed development

9.4.1 The application seeks to extract sand and gravel from the site through 5 phases of development. The mineral would be transported by road to the existing Plant Site at Monkey Island. Therefore, the extraction site would not require the mineral processing infrastructure. It is proposed to restore the site to the original agricultural land quality at the original ground levels. This would be achieved by importing inert material to fill the void after extraction and restoring the original soils. In order to control groundwater movement, it is proposed to construct a perimeter clay seal and to isolate each phase during extraction and filling.

9.4.2 There are five fundamental parameters which have determined the design of the working and restoration scheme.

- A cut off ditch and a perimeter clay seal would be constructed to prevent ingress and egress of groundwater.
- The development includes 24.44 hectares of grades 2 and 3a best and most versatile land in the operational area.
- The operational land would be brought back to existing ground levels by importation of inert fill, and restored to agriculture using the indigenous soils.
- Filling would progressively follow the extraction operation with a one year lag, to facilitate soil restoration by direct placement for the majority of the site.
- Extraction at a rate of 250,000 tonnes per year would take 7 years and infilling is anticipated to be at the same rate. Restoration would be completed 10 years after the start date.

9.4.3 The phased scheme of working and restoration ensures that the two different soil types would be restored in discrete parcels of land. There are 5 phases of working but Phase 5 comprises 5A and 5B as separate parcels of land. The scheme includes a number of concurrent operations relating to the construction of the cut-off ditch and clay sealing, soil lifting and storage or direct placement, mineral extraction and inert filling.

9.4.4 During the Initial Development the topsoil and subsoil from Phase 5B would be lifted and placed into long term storage on the perimeter. Phase 5B would not be required immediately for extraction but would be an operational area for waste reception and soil storage.

9.4.5 Phase 1 soils would be lifted and separately stored to create space for ditch, clay seal, extraction and inert filling. Phase 2 soils would be lifted and directly placed to restore the prepared area within Phase 1. Thereafter, there would be a rolling programme of

extraction, filling and restoration by direct placement of soils lifted from subsequent phase. The final restoration of Phases 5A and 5B would use soils which were lifted and stored during the initial development. Throughout the phased programme Soil Types 1 and 2 would be handled and restored separately.

9.5 Potential Impacts and Mitigation

9.5.1 For this development the main issues relate to the impact on agricultural land and quality and farm viability through the temporary loss of land and effect of soil handling on restored land quality.

9.5.2 The main effects of the development relate to moving soil from its existing position to either a new location via direct placement as part of the restoration works, or to a period of storage before moving again to its final position for restoration. In this respect the assessment of impacts are addressed through the matters identified by Natural England. These are summarised below, identifying the Impact and the Mitigation

The loss of agricultural land and impact on land quality, particularly of any 'best and most versatile' (BMV) agricultural land.

9.5.3 The operational area includes nearly 25 hectares of best and most versatile (grades 2 and 3a) agricultural land. During the phased working and restoration there would be a temporary loss of agricultural land, but the whole site would be restored to original ground levels with the indigenous soils, with the exception of a small pond area.

9.5.4 The extraction operation would take 7 years and there would be a lead time of one year before restoration by direct placement would start. There is, therefore, no long-term or permanent impact on BMV land.

Proposals for handling different types of soil, storage of soils and their management in store.

9.5.5 Two soil types have been identified for separate handling and restoration.

9.5.6 Where soils are placed in store for a temporary period before use in restoration there are a number of situations when the soil could be damaged.

9.5.7 Mitigation measures against damage during the storage period relate to the method of building soil stores and removing soils from store, and the soil condition (dry and friable) when the soils are moved. These aspects are described below.

9.5.8 The proposed methods of building stores are approved by Natural England, and temporary soil stores would not be trafficked other than for maintenance purposes.

Methods of soil handling with reference to Defra's Good Practice Guide for Handling Soils.

9.5.9 The method of soil handling can have a significant impact on soil condition and quality and should be considered in conjunction with the phased working and restoration scheme. Use of inappropriate equipment in wet conditions can damage restored soil.

9.5.10 For soil stripping, building soil storage mounds, excavating soil storage mounds and soil decompaction, sheets 1, 3, 14 and 19 of the MAFF (2000), Good Practice Guide For Handling Soils (version 04/00), FRCA Cambridge, would be adopted as follows:

- Sheet 1 Soil stripping with excavators and dump trucks.
- Sheet 3 Excavating soil storage mounds with excavators and dump trucks.
- Sheet 14 Building soil storage mounds with bulldozers and dump trucks.
- Sheet 19 Soil decompaction with bulldozer drawn tines.

9.5.11 Soil replacement would be by the Peninsula (or Lateral Heap) method. This method is specifically chosen to minimise soil compaction by wheeled dump trucks operating on lower layers, while lightly compressing the restored soil profile to avoid subsequent settlement.

9.5.12 The proposed methods of soil handling are recognised by Natural England as good practice.

Methods of assessing whether soils are in a suitably dry condition to be handled.

9.5.13 Handling soils in unsuitable conditions can cause long term damage by smearing and compaction.

9.5.14 Specifications for weather and soil conditions are proposed, which would ensure that soils are only handled in approved moisture conditions. This is recognised by Natural England as good practice.

Proposed restored profiles.

9.5.15 The majority of the site would be restored by direct placement of the soils, and thereby, it is anticipated that the target profile would copy the exiting soil profile.

Land drainage, access and water supply

9.5.16 For the continued use of the agricultural land until it is required for extraction the drainage, access and water supply would be maintained.

Farm structure and viability

9.5.17 In accordance with the significance criteria the impact on farm businesses is Minor Adverse as there is short-term tenancy without legal security of tenure.

Restoration Plan

9.5.18 A comprehensive restoration plan is provided as required.

9.6 Recommendations

Supervision and monitoring

9.6.1 To ensure that the proposed phased working and restoration scheme succeeds a programme of supervision, monitoring and reporting would be agreed. It is recommended that in advance of each phase of extraction a detailed soil survey of the stripping areas is undertaken to predict the thickness of topsoil, upper subsoil and lower subsoil, notwithstanding the data already obtained. This would inform the volumes of temporary and long-term bunds and the restoration depths to enable accurate survey control. It would also precisely identify the boundary between Soil Types 1 and 2.

9.6.2 At the end of each soil moving season a full audit of soil material would be completed. This would enable a comparison to be made with the predicted soil volumes and any effect on restoration profiles can be assessed and adjusted.

Aftercare

9.6.3 The restored land would undergo a minimum 5-year aftercare period. This would take the form of an Outline Aftercare Strategy and Detailed Annual Management Programmes.

9.6.4 It is expected that the provision of the Aftercare Schemes would be a condition of planning consent if granted.

9.7 Conclusions

9.7.1 It is concluded that the detailed development and mitigation measures which are proposed comply with the advice which Natural England consistently provides for the protection of agricultural land and sustainable use of soils in line with NPPF Policies.

9.7.2 There is no loss of agricultural land and although BMV land is affected it would be restored with the indigenous soils. Additionally, the distribution of the two soil types would be rationalised so that each soil type is used to restore a distinct parcel of land.

9.7.3 It is considered that the proposals constitute a sustainable use of soils.

9.7.4 Recommendations for the Supervision and Monitoring of soil handling during the working and restoration phases, and post-restoration Aftercare are designed to ensure that the site is restored to its original agricultural land classification.

9.7.5 Within the parameters of the adopted significance criteria there is no impact on BMV land and the impact on the tenant farm business is confirmed as Minor Adverse as the tenant has no long-term security of tenure.

10.0 CULTURAL HERITAGE ASSESSMENT

The full-length version of the Cultural Heritage Assessment is included in the Environmental Statement (Technical Studies) in Volume 3.

10.1 Author of the Report

10.1.1 The Heritage Impact Assessment was prepared by John Moore Heritage Services (JMHS), a heritage consultancy and archaeological practice with extensive and wide-ranging experience within the sector. JMHS is registered with the Chartered Institute for Archaeologists and all work is fully complicit with bodies such as RCHME, Historic England and CADW.

10.1.2 Tom Rose-Jones BSc PCIfA, the author of this report, is an Archaeological Project Officer and Heritage Assistant with 5 years of experience working within the heritage sector. The report was based on an earlier Heritage Impact Assessment authored by Kimberley Dowding BA PCIfA and Dr Stephen Yeates MA, P.Phil and MCIfA.

10.2 Introduction

10.2.1 This document summarises an investigation into the potential for archaeological remains on land adjacent to Water Oakley, Berkshire and the potential of the subsequent development proposals to impact upon any potential archaeological remains.

10.2.2 The primary aim of the assessment is to provide a professional appraisal of the archaeological potential of the site and its setting. This follows the Government guidance in NPPF by presenting an account of the available archaeological and historical data and its significance at an early stage in the planning process

10.3 Baseline Conditions

10.3.1 Baseline conditions have been established using predictive modelling based on the known distribution of remains within an irregular polygonal shape located around the site. The information about heritage assets both designated (scheduled ancient monuments and listed buildings) and non-designated within the search area (sites on the Historic Environment Record) were collated to provide a wider picture of the historic development of the landscape and thus the potential of surviving heritage assets in the vicinity. Sources consulted include the Royal Borough of Windsor and Maidenhead Historic Environment Record (HER), The Buckinghamshire Historic Environment Record (HER), The Reading Record Office and the National Monuments Record photographic collection.

10.3.2 The documentary search was supplemented by a programme of evaluative fieldwork undertaken in 2016; this involved the excavation of 70 archaeological and 29 geoarchaeological trial trenches across the proposal site.

10.3.3 The earliest activity within the general area has been dated to the Mesolithic period with the identification of two significant sites close to the proposal site. Both of the

significant sites demonstrated long term occupation, with nationally important archaeology along the banks of the River Thames.

10.3.4 Activity within the general area continued into the Neolithic and Bronze Age, with a focus of known activity in the area of the Eton Rowing Lake and Bray Quarry. This activity continued into the Iron Age; within the boundary of the proposal site archaeological evaluation revealed evidence of two possible Late Iron Age/Romano British farmsteads and associated field systems.

10.3.5 These farmsteads appear to have developed from the Late Iron Age through the Early Roman period up to the 2nd Century AD. The various finds recovered from the Late Iron Age/Early Roman features seem to suggest a fairly low status settlement with small scale agricultural and possible metalworking from the slag occurring on site. Small-scale funeral practices were also apparent with one human cremation and two separate pits containing pyre debris.

10.3.6 The occupation of the area continued into the Roman period with the establishment of late Roman cemeteries, also located along the south bank of the river. Roman activity in the search area is more significant, and primarily recognised to the north of the site. The use of the cemeteries continued into the Early Medieval period, but activity within the area appears to have decreased at this time.

10.3.7 During the Early Medieval and Medieval period, activity within the area moves to the north bank of the River Thames occurring on the later Dorney Estate.

10.3.8 In the Post-medieval period, activity to the south of the River Thames increased and was primarily based around agricultural practices and continued into the Modern period. Much of this activity that is of any note is focussed at a number of key locations outside the proposal site.

10.3.9 Archaeological evaluation on the proposal site revealed a series of Post-Medieval features such as agricultural furrows, ditches and a quarry pit, although these were less numerous than the prehistoric features observed.

10.4 Potential and Predicted Environmental Impacts

10.4.1 The main aspects of the development that have been assessed as having the potential to impact the historic environment of the site and surrounding area are outlined below:

- Overburden removal and mineral extraction.
- Transport of extracted materials to processing site at Monkey Island Lane.

10.4.2 Removal of the overburden and subsequent extraction of the mineral resource would result in the destruction of buried archaeological remains within the area of extraction. As buried archaeological remains are known to be present across the proposal site the impact upon the historic environment would be substantial. This would be the primary

impact of the proposal upon the historic environment, and as such would require a programme of mitigation.

10.4.3 There is potential for the workings to have a possible visual impact upon any designated heritage assets within the local historic environment. Three listed buildings are located within 1km of the extraction site, however the vegetation surrounding the proposal site and the presence of several non-listed buildings (between the listed buildings and the proposal site) would result in minimal visual impact.

10.4.4 HGV movements can cause physical damage to the structure of listed buildings due to vibration, however, the listed buildings within the search area are at a safe distance from the route to the processing plant.

10.5 Mitigation of Impacts

10.5.1 Prior to the relevant phase of overburden removal and extraction commencing a programme of archaeological excavation is proposed. Excavation would be focused upon five areas, the location of which have been determined through archaeological field evaluation.

10.5.2 The proposed five investigation areas would be stripped to the archaeological horizon under archaeological supervision. The areas would be hand cleaned and archaeological features subsequently planned. This would be followed by sample excavation of the archaeological features present; respective sample sizes would be determined by Berkshire Archaeology.

10.5.3 The rest of the site would be subject to an archaeological watching brief during overburden stripping; in this case a strip, map and sample exercise is considered to be the most appropriate method of investigation.

10.5.4 A strip, map and sample exercise is deployed on the investigation of large, open areas, where the emphasis is on achieving an accurate plan of features, such as a field system or isolated structures, followed by selective excavation to answer specific questions. It is normally deployed where the potential is for a low density of archaeological deposits but where their spatial disposition would make an important contribution to the wider understanding of the historic landscape.

10.5.5 This exercise therefore normally requires topsoil/subsoil removal in a manner appropriate to excavation. The sampling strategy would normally involve up to 5% by length of archaeological ditches and a representative sample of discrete features, which would normally be no more than 50% sampled. However the sampling strategy needs to be flexible and contingency should be provided for additional investigation in case of the identification of exceptional deposits, such as burials.

10.5.6 Due to the distance between the listed buildings and the proposal site, the vegetation surrounding the proposal site and the presence of several non-listed buildings, there would be minimal visual impact on the listed buildings.

10.5.7 The same is true of any physical impact; the HGV route between the proposal site and the Monkey Island Lane processing plant is not anticipated to have any physical impact upon the listed buildings located within the search area, due to the distance of the buildings from the planned route between the two sites.

10.6 Potential Residual Impacts

10.6.1 There would be no significant remaining adverse effects on archaeological or cultural heritage resources provided the proposed mitigation measures are implemented. It is important to ensure that the highest standard of recording and excavation is undertaken as the resource would be destroyed during extraction.

10.6.2 There is potential for impact during the watching brief phase of mitigation: The intermittent nature of these operations can lead to an accidental lack of notification, resulting in no archaeological supervision during stripping of soil layers and subsequent removal of the overburden. This could potentially result in the destruction of any buried archaeological remains; as such it is important that adequate notification is given to the relevant archaeological practice in order to ensure archaeological supervision during stripping.

10.7 Conclusions

10.7.1 A search of the relevant sources uncovered evidence of human activity within the surrounding area from the Mesolithic period onwards, with the majority of the earlier activity based along the banks of the River Thames.

10.7.2 In recent years, archaeological work within the area has identified two sites containing nationally significant Prehistoric archaeology along the river. Activity continued in the area through the Roman and Early Medieval periods, with the establishment of cemeteries along with other features.

10.7.3 During the Medieval period activity began to focus upon the areas of settlement that are found today; this activity increased during the post-Medieval and Modern period.

10.7.4 Archaeological evaluation within the site revealed a series of archaeological features and deposits. These predominantly appeared to represent the remains of two small farmsteads with enclosures and associated field systems that developed from the Late Iron Age through the Early Roman period, up to the 2nd Century AD. Later Post-Medieval features such as furrows, ditches and a quarry pit were also present across the site, albeit in fewer numbers.

10.7.5 Potential impact upon the historic environment is considered to be substantial. As such a two stage programme of mitigation is proposed; stage one would comprise five areas of archaeological excavation focused upon the trenches that showed the highest density of features during evaluation. This would be undertaken prior to overburden removal and extraction in those areas. Stage two would be carried out as a strip map and sample watching brief, undertaken during the rest of the overburden removal.

10.7.6 The potential for impact to the historic environment as a result of the proposed development is considered to be substantial; as such the adoption and implementation of the recommended mitigation measures is of importance.

11.0 LANDSCAPE CHARACTER AND VISUAL IMPACT ASSESSMENT

The full-length version of the Landscape and Visual Impact Assessment is included in the Environmental Statement (Technical Studies) in Volume 3.

11.1 Author of the Report

11.1.1 The Landscape and Visual Impact of the proposed Water Oakley sand and gravel extraction was assessed and prepared by Pleydell Smithyman Limited who are Landscape Architects, Environmental Design and Business Consultants based in Ironbridge, Shropshire. Pleydell Smithyman Limited is a practice registered with the Landscape Institute and is a corporate member of the Institute of Environmental Management and Assessment. The practice specialises in landscape architectural design and assessment works relating to environmental planning and the minerals and waste industries. This landscape and visual impact assessment was undertaken in accordance with latest best practice guidance by a Chartered Landscape Architect.

11.2 Introduction

11.2.1 The site extends to approximately 55.4ha and is located south of the A308 and the hamlet of Water Oakley, and northeast of the village of Fifield.

11.2.2 The development would involve the phased extraction of approximately 1.7 million tonnes of sand and gravel which would be worked at a rate of up to 250,000 tonnes per annum and the progressive restoration of the 32.8ha extraction area to agriculture. Extraction and restoration would be completed within a 10 year period.

11.2.3 The proposed development subject to this ES would be facilitated by processing of the mineral at the existing plant site at Monkey Island Lane that has permanent planning permission for the importation, processing and sale of sand and gravel.

11.3 Baseline Conditions

11.3.1 The Study Area extends to 3km in all directions from the edge of the site, as beyond this distance it is predicted that there would no potential for any potentially significant landscape and visual effects.

11.3.2 No part of the site or Study Area lies within a statutorily or non-statutorily designated landscape. The site is located within the Green Belt and a modest number of ecological and cultural heritage designations within the wider study area contribute to an assessment of landscape value. No Tree Preservation Orders apply to the site or adjoining land.

11.3.3 The Development Plan policies that are relevant to landscape and visual matters were reviewed and in summary cover protection of valuable landscape features, protection of the amenities of settlements and rights of way network. The policies also outline how the Council will also seek appropriate landscape enhancement including the creation or restoration of landscape features.

11.3.4 National and local level published landscape character assessments have been reviewed and in summary describe a settled flood plain where there is actual and perceived proximity to urban conurbations. The area has historically been and is currently subject to sand and gravel extraction and tranquillity is reduced by major road corridors.

11.3.5 A broad area of search for potential viewpoint locations was carried out using specialist digital terrain modelling and analysis software which was used to calculate a Zone of Theoretical Visibility (ZTV) of the proposed development.

11.3.6 The site comprises a large-scale arable field with advance screen planting of native woodland belts along much of the northern and southern boundaries and the full extent of the eastern and western boundaries. Mature field boundary hedgerows connect to the semi-mature screen planting along the southern boundary.

11.3.7 The site is located on relatively flat ground at around 24m to 28mAOD with a typical slight fall across the Site from south to north. A public footpath passes through the eastern part of the site.

11.3.8 The closest residential properties lie along the A508 Windsor Road to the north and the Fifield Road to the west; however, intervisibility is restricted by intervening planting along the boundary of the site.

11.3.9 The surrounding area from where it is predicted that the proposed development would be potentially visible is very localised due to the predominantly flat landform and the visual barriers of surrounding screen planting and built development.

11.4 Potential Effects

11.4.1 The potential landscape effects at the operational phase of the development include the temporary loss of BMV agricultural land within the proposed extraction area. The potential for the greatest adverse effects upon landscape character would occur within the extraction area with external effects restricted due to the adoption of perimeter screen bunds, the relatively flat landform and frequent interlying buildings and vegetation.

11.4.2 In terms of potential cumulative effects, there are no active quarries within the study area that are relevant to consider in combination with the development. The processing plant on Monkey Island Lane would be used to process the mineral from the site.

11.4.3 The development scheme incorporates a number of design parameters in order to minimise landscape and visual effects during the operational phase, as well as the configuration of the restoration scheme.

11.4.4 The area from where it is predicted that the development would be potentially visible is very localised due to the predominantly flat landform and the visual barrier of surrounding planting and built development. A range of locations were reviewed in the field in summer and winter to establish the potential for inter-visibility.

11.4.5 As part of the field assessment a number of potential viewpoint locations were scoped out of further consideration and 14 representative viewpoint locations were selected for detailed assessment. The viewpoint assessment assisted the prediction of impacts upon all nearby receptors potentially significantly affected by the development.

11.5 Predicted Effects

Landscape Effects

11.5.1 The development would retain all existing trees and hedgerows adjacent or along the perimeter of the extension area apart from several meters width to be removed to facilitate the proposed access onto the A308. The temporary loss of agricultural land is assessed by others.

11.5.2 At a site level during the operational phase there would be a Medium magnitude of effect due to the phased extraction and progressive restoration resulting in a Moderate adverse effect on the landscape character of the site that is Not Significant.

11.5.3 It is proposed to restore the extraction area to agricultural land of comparable grade to the current farmland and at similar levels to the existing landform. New field boundary hedgerows of 2.65km combined length with trees are proposed. New landscape features include an area of species rich grassland along the public footpath and around a new pond in the southeast corner of the site. The peripheral drainage ditches are to be retained following the extraction. In addition, there would also be two new sections of footpath linking the existing public rights of way. Overall this would constitute a Medium magnitude of change and a Moderate beneficial effect on the landscape structure of the site that is Not Significant.

11.5.4 No Significant effects on landscape character beyond the extraction area boundary or upon the wider landscape, including adjacent landscape character types and areas would occur during the operational or restored phase of the development.

11.5.5 Following completion of restoration of the extraction area to agriculture there would be a Negligible effect upon landscape character compared with the baseline.

Visual Effects

11.5.6 The ZTV plan indicates the greatest theoretical magnitude of visibility lies within circa 300m of the site, with a small outlier of theoretical visibility on elevated land near Braywood House, more than 1.2km south of the site at the closest point. The ZTV indicates a conservative pattern of theoretical visibility as it does not take into account perimeter screen bunds proposed as part of the mitigation measures.

11.5.7 Views would be predominantly restricted to the public rights of way to the south and east of the site, noting that the public footpath that passes through the site would be subject to a temporary diversion. There would be restricted views from the A308 along the northern boundary of the site and filtered views from scattered dwellings along the A308 and also Fifield Road to the east.

11.5.8 Users of the public footpaths 51A, 54 and diverted path 53 along the southern and eastern boundaries would experience Moderate/Slight visual effects from sections of the routes, during the operational phase only that would be Not Significant. The visual effects that would be experienced from other publicly accessible locations including the public footpaths to the south of the site would be Slight adverse or less during the operational phase. Following completion of restoration, the visual effects from all public rights of way would be typically Negligible to Neutral.

11.5.9 It is an established planning principle that there is 'no right to a private view'; however, the impact upon private visual amenity where new development has the potential to result in overbearing and/or unacceptable effects on living conditions is a material planning consideration.

11.5.10 The closest private receptors are scattered dwellings along the A308 Windsor Road corridor to the north of the site and from properties on Fifield Road to the northwest. In addition, there are private recreational receptors comprising the Queens Acre Camping and Caravan Park off the A308 and the Wayside Riding Stables off Fifield Road. Effects upon private receptors during the operational phase have been assessed as Moderate at most and Not Significant. It should be noted that where views are not already screened by perimeter planting the proposed 4 to 5m high earth bund would prevent ground level visibility of the extraction. Following restoration, the residual effect upon visual amenity would be Negligible to Neutral and Not Significant.

11.6 Mitigation Measures

11.6.1 The design of the operational phase of the development has incorporated a number of in-built mitigation measures as follows:

- Use of phased soil storage and screening bunds around the extraction area to minimise the impact of the development upon nearby visual receptors including users of public rights of way and residential properties to the north and east of the site.

- A phased working scheme with progressive restoration developing the site from the east and extending west with the final phase extending into the northernmost parcels of land closest to the A308.

- Restoration of the extraction area by infilling with inert fill and restoring to agricultural land at a similar height to existing levels to ensure that the finished landscape is similar to the baseline with enhancement from additional hedge planting, ditches and a small pond.

11.7 Residual Effects

11.7.1 The assessment process found that while the development would be visually contained at close range by mitigation measures, including perimeter screening bunds some residual adverse impacts would occur during the operational period; however, these would be at a Moderate level at most and Not Significant, as experienced by

users of nearby public rights of way. Due to existing intervening screen planting and the inclusion of perimeter screen bunds, properties to the north and northwest of the site would experience Slight to Moderate effects during the operational period that would be Not Significant.

11.7.2 Post-operational phase landscape and visual effects following completion of the restoration would be Negligible to Neutral and Not Significant.

11.8 Conclusions

11.8.1 Overall it is assessed that the development could be accommodated with only modest and localised adverse landscape and visual effects during the 10 year operational phase that would be Not Significant.

11.8.2 The proposed development would comply with relevant planning policy as it is assessed that the proposals would avoid the removal of any high sensitivity landscape features and ensure that in-built mitigation measures would minimise landscape effects and impacts upon local residents and users of the public rights of way network. The progressive restoration of the site would result in a landform similar to the current situation. The 2.65km of new field boundary hedgerows and other landscape features represent a Moderate beneficial change at a site level.

12.0 ECOLOGICAL IMPACT ASSESSMENT

The full-length version of the Ecological Impact Assessment is included in the Environmental Statement (Technical Studies) in Volume 3.

12.1 Author of the Report

12.1.1 The ecological assessment was undertaken by Ward Associates, an independent ecological consultancy with extensive experience of habitat assessment, restoration and management and working for conservation agencies, academic, commercial and industrial clients in the UK and overseas.

12.1.2 Report preparation was undertaken by Diana Ward MSc CBiol MSB MCIEEM.

12.2 Introduction

12.2.1 This report presents an assessment of the ecological importance of the application area, evaluation of the effects of developing the site, identification of the measures to minimise significant negative effects and prescription of appropriate mitigation and compensation measures so as to enhance biodiversity. It concludes with an assessment of the residual impact of the proposed development.

12.3 Baseline Conditions

12.3.1 Following a preliminary assessment of the potential of the site in the light of the proposed development and a data search undertaken by the Thames Valley Environmental Records Centre (TVERC), a Phase 1 survey, badger survey and assessment of the breeding bird interest, concentrating on skylarks, were undertaken in 2016. An eDNA assessment of a pond (P1) outside the development footprint was undertaken to identify the presence or absence of great crested newts. The site was revisited in 2018.

12.3.2 The total site is 55.4ha and is situated south of, and adjacent to, the Windsor Road (A308). To the north is an old gravel working on the opposite side of the road and built land. A caravan park and filling station abut the site to the north. To the west is the Fifield Road and a development known as the Guild House. To the south-west is the Longlea Nursing Home and agricultural land including arable, fields with hedges and ditches. To the east is agricultural land.

12.3.3 There are two Sites of Special Scientific Interest (SSSI) within a 2km radius of the site. The closest to the north-west and approximately 380 metres distant on the opposite side of the A308 is Bray Pennyroyal Field SSSI. Approximately 1500 metres to the south is Windsor Forest and Great Park SSSI and Special Area of Conservation (SAC). Designated as part of the largest continuous tract of woodland and parkland in Berkshire, the site provides habitat for a range of rare species of invertebrate.

12.3.4 Sutherland Grange Local Nature Reserve is 1800 metres to the east on bank of the River Thames. It is a haymeadow managed by the Royal Borough of Windsor and

Maidenhead. There are four non-statutory designated sites within a 2km radius. None abut the site and all are separated by either a settlement or the River Thames.

12.3.5 A limited number of species were identified by TVERC as being legally protected or notable and within 2 km.

12.3.6 The site itself comprises a large central area of cropped land divided by a track, alongside which is a dry ditch. There is screening planting to the entire western boundary, the north where the site abuts the road, the whole of the eastern boundary and part of the southern boundary. Beyond the planting, to the south, west and east are hedges. **Figure 12.1** below identifies features referred to in the text.

Figure 12.1 Phase 1 Survey Plan

12.3.7 The arable contains two fields separated by a broad grass strip, dry ditch and track. The western field is approximately 42ha and the eastern field is approximately 11.5ha. At the time of survey both were sown with winter wheat. No protected or uncommon arable weeds were recorded.

12.3.8 Screening plantations are around 8 metre high and, together with the existing hedges, they completely enclose the site. The trees and shrubs are largely native broadleaves though a small proportion of Italian alder and Leyland cypress is also present. The ground layer vegetation is dominated by false oat-grass with much bramble, Butterfly-bush has established in one place.

12.3.9 There are boundary hedges along the whole of the south side, to the east, and around properties present at two points on the north side of the site. Those to the south are long-established. They are unmanaged apart from some trimming of the lower face adjoining the cropped land and/or the line of the public footpath and principally comprise tall hawthorn and blackthorn with pedunculate oak, mostly mature, and ash trees.

12.3.10 On the north side, the Queen's Acre property has a boundary hedge of bushy hawthorn and blackthorn with some elder and sycamore. The Guild House property is bordered on its east side by a line of conifers with primarily tall hawthorn and willows and to the south side by lime trees, conifers, blackthorn and hawthorn.

12.3.11 The field margins immediately adjacent to the crop are herbicided and largely free of vegetation but at the foot of the adjacent hedges or screening plantings and along the sides of the public footpaths there is a typical and moderately diverse flora, although with no rare, protected or uncommon species.

12.3.12 A ditch line is present along part of the southern boundary which become progressively wetter towards the east, with great willowherb, reed canary-grass and hemlock water-dropwort present.

12.3.13 The two fields of winter wheat are separated by a broad grassy baulk with a track and a deep ditch which remained dry through the survey period.

12.3.14 No plant species included within the Red Data list for Great Britain (Stroh *et al*., 2014) as Critically Endangered, Endangered, Vulnerable or Lower Risk (Near Threatened) were recorded. No species has priority status in the UK Biodiversity Action Plan or is listed as Species of Principal Importance under the Natural Environment and Rural Communities Act 2006. Overall both the habitats on site and the plant species present are of site importance.

12.3.15 Data for the breeding bird surveys identify that there were between 7 and 11 skylark territories present across the site giving a typical density for the region. No other ground nesting birds were recorded. The new planting is too young to provide much in the way of nesting sites. The surrounding hedges would hold a typical breeding bird assemblage.

12.3.16 No signs of badgers were found and eDNA sampling for great crested newts in P1 was negative. No species of reptiles are likely to breed on the site but it is possible that grass snake might use the central track on a transient basis. No habitat within the site is suitable for roosting bats and foraging and commuting is likely to be limited to the margins. No species of amphibians or reptiles are likely to breed on the site. It is possible that grass snake might use the central track on a transient basis.

12.3.17 The skylark is a Species of Principal Importance (SPI) but the latest population estimate is 1.5 million pairs in Britain in 2009, with 90% of 10 km squares holding probable or confirmed breeding territories. The density of skylark suggests that it is of local significance. Of the potential bird species of the surrounding hedges and shelter belts,

song thrush, dunnock and bullfinch are all SPI. All are widespread and common however and the bird assemblage generally is likely to be of site importance.

12.4 Potential Environmental Impacts

12.4.1 Consideration has been given to the potential effects of extracting mineral and restoration to agriculture using inert fill and quarry overburden. These are direct and indirect changes in species and habitat, noise and human disturbance, dust and hydrological changes as well as these impacts on designated sites.

12.4.2 There would be the loss of the following areas of land to extraction, soil storage bunds, the construction of an access and site offices. These impacts are certain.

- 33 ha of arable
- 300 sq metres of recent planting for the access
- 300 metres intermittently wet ditch
- 300 metres track and associated grassland

12.4.3 There would be no further loss of any of the recent planting or any peripheral hedges or their mature trees, all of which are within and sheltered by the recent planting.

12.4.4 No habitat to be lost is considered to be anything other than of site ecological significance throughout the application area. The overall effect of the loss is considered to be low negative. No nationally scarce plants or protected plants have been found within the survey area.

12.4.5 The site holds little habitat capable of holding invertebrate interest. The temporarily open sands would provide areas which would probably attract a number of specialist invertebrates. Typically these would include the aculeate hymenoptera which require surfaces into which to burrow and warm sunny slopes with relatively little vegetation. It is likely, though not certain, that this would be a low positive effect

12.4.6 No species of amphibians or reptiles are likely to breed on the site. It is possible that grass snake might use the central track on a transient basis. The effect of the impact is considered to be not significant.

12.4.7 The statuses in the county and national population sizes of most of the bird species are such that loss of breeding or wintering habitat within the application site would not be significant. The only S41 priority species likely to be affected is skylark as a result of the loss of habitat. Habitat for this species would however remain over the duration of the extraction and infilling as a result of the phased extraction and infilling. There would be a low negative effect.

12.4.8 It is possible that the quarrying operations may provide temporary suitable habitat for the little ringed plover, a Schedule 1 species protected under the Wildlife and

Countryside Act 1981, and sand martin which is listed as a Red List species by the RSPB et al (2002) which would be a low positive effect, although not certain.

12.4.9 No signs of breeding badgers were recorded and thus any effect is not significant. Similarly no habitat that might hold a bat roost would be affected and there is a standoff of recent planting between any mature trees and the proposed extraction. Commuting routes would be retained together with potential foraging areas. Any effect would not be significant.

12.4.10 Birds and mammals are potentially susceptible to disturbance by human presence and by noise, either of which may deny them the opportunity to use otherwise suitable habitat for feeding or breeding, or cause desertion of occupied breeding sites. However, different species have different tolerances and some habituate to activities. Given the species recorded and the proximity of the A308 it is not considered that there would be any significant effect either during the extraction or during the restoration.

12.4.11 Some plant species such as mosses and lichens may be damaged or buried by dust where it is generated in quantity and not removed by rainfall. These plant groups were not surveyed and, on the basis of the habitat and substrate types present, it is probable that a number of common species are present. There are no grounds to consider that scarce species could occur. No likely significant effect is predicted.

12.4.12 The quarry design has inbuilt mitigation measures to prevent any direct or indirect significant effects associated with the development. These include wet working, site/surface water management practice employing sustainable drainage systems (SuDS) comprising grassed swales, settlement ponds, temporary sumps and catchpits and an Environmental Management Plan, which would identify environmental measures throughout the life of the quarry. The restoration scheme would reflect pre-development conditions by preventing among other factors, increases in runoff and modifications to local surface drainage patterns and flow.

12.4.13 The conclusion of the hydrology chapter is that there would be a negligible effect on the surface and ground water regimes and water quality which is not significant. On this basis, given that there are no hydrologically sensitive features on site, other than the intermittently wet ditch line along the track and the ditch line to the south some 150 metres from the closest point of extraction, no significant effect is predicted on the ecology.

12.4.14 There would be no direct or indirect effect on any designated site be they SSSI or County Wildlife Site.

12.5 Mitigation of Impacts

12.5.1 As part of the iterative process of designing the quarry design and restoration, some mitigation is embedded in the design, notably the retention of all new planting around the site together with the exception of a small loss for an access. This protects the hedges and associated tracks immediately outside the application site. The restoration

scheme includes a number of biodiversity enhancements which are described later in this section and shown on the **Restoration Concept plan.**

12.5.2 The worked site would be infilled with inert material and restored to agriculture. As part of this, there would be the new planting of a total of 2160 metres hedges with clumps of trees planted in the corners. Species composition would reflect those species currently present on the site so as to increase the flowering and fruiting season to benefit invertebrates and birds. To provide maximum benefit, planting in these areas would be undertaken so as to comprise a transition from grass and herbs through bushes to trees.

12.5.3 An area of wildlife habitat would be provided towards the south of the site. This would comprise an area of species rich grassland and a pond totalling 0.5 ha. Seeding would take place using proprietary mix such as Emorsgate EM5. The land would be suitable for foraging and potentially breeding reptiles. Hibernacula would be provided. The pond would be separated from any other water feature and would have shallow margins suitable for the development of marginal aquatic communities. Aquatic planting would take place. It is expected that it would particularly benefit dragon and damselflies and amphibians.

12.5.4 The central track would be replaced and this would be bordered with rough grassland which should prove a valuable hunting ground for owls, possibly including barn owl, and kestrel.

12.5.5 Prior to the loss of the track and associated rough grassland, a programme of phase vegetation management would be instigated to ensure that no reptiles are present. All reptiles are protected against intentional and reckless killing and injuring under the Wildlife and Countryside Act 1981

12.5.6 There are not considered to be any further species issues to be addressed. No further compensation or mitigation is proposed.

12.5.7 No noise and disturbance, dust or hydrological issues were identified which might have a deleterious effect on the ecological value of the site and thus no mitigation or compensation measures are proposed. There would be no impact on any designated sites.

12.6 Potential Residual Impacts

12.6.1 **Table 12.1** details the compensation and mitigation proposals against the potential ecological effects identified so as to identify the residual effect.

	Effect	Habitat or Species	Significance	Compensation/ Mitigation/ Enhancement	Final Impact after establishment
Habitat change and species effects					
Grassland, intermittently wet ditch and track	Loss of 300 metre length	Common habitats, little botanical significance	Low negative	Replacement track (300 metres) with wider grassland area and 1800 metres of new perimeter ditch	Low positive
Trees	Loss of 300 sq metre of recent planting trees for access	Common habitat	Low negative	Replacement planting in field corners, increase of 7000 sq m	Low positive
Hedges				Creation of 2160 metres hedges with oak standards	Low positive
Arable	Loss of 33ha	Common habitats skylark population	Low negative	Replacement 29.5ha (permanent loss of 3.5ha)	Low negative
Creation of nature conservation area				Species rich grassland and pond of 0.5ha	Low positive
Invertebrates	Increased range of species due to quarrying		Low positive		Low positive
Reptiles	Temporary loss of foraging habitat along ditch	Transient grass snake	Not significant	Replacement of foraging habitat	Neutral
Birds	Loss of habitat	Skylark	Low negative	Replacement habitat	Neutral
	Gain of habitat	Little ringed plover, sand martin	Low positive		Low positive
Badgers	Not present		Not significant		Not significant
Bats			Not significant		Not significant
Disturbance	Noise of quarrying operations	Breeding birds	Not significant		Not significant
Dust			Not significant		Not significant
Hydrological effects			Not significant		Not significant

	Effect	Habitat or Species	Significance	Compensation/ Mitigation/ Enhancement	Final Impact after establishment
Designated Sites			No effect		No effect

Table 12.1 Ecological Residual effects after compensation and mitigation

12.1 Conclusions

12.1.1 As a result of the proposed development there would be the temporary loss of 33ha of arable, 300 square metres of recent planting for the access, 300 metres of intermittently wet ditch and 300 metres of track and associated grassland

12.1.2 Restoration would take place on a rolling basis and would result in the gain of 2160 metres species rich hedges with standard oaks, 0.7 ha planting in field corners, 0.5 ha of wildlife planting including species-rich grassland and a pond and the replacement of the track and associated grassland. There would be creation of 1800 metres of new perimeter drain created which would be intermittently wet. The remainder of the site would be returned to arable.

12.1.3 The restoration of increased area of grassland and greater length of intermittently wet ditch, planting of hedges, the wildlife area and the tree planting in field corners together with the increase in invertebrate diversity and potential for sand martin and little ringed plover during quarrying are all of low positive significance. All other impacts are neutral after mitigation and compensation with the exception of the loss of 3.5ha arable which would largely be restored to grassland. There would be no impact on any designated site.

13.0 WATER REGIME

The full-length version of the Water Regime Assessment is included in the Environmental Statement (Technical Studies) in Volume 3.

13.1 Author of the Report

13.1.1 The Water Environment Assessment was prepared by SLR Consulting, a multi-disciplinary consultancy with extensive experience within the aggregates, cement, industrial minerals, energy minerals, building products and mining sectors. SLR has extensive experience in water environment assessments, particularly of mineral extraction and restoration operations.

13.1.2 David Morgan, the author of this report, is a Technical Director within the Water Environment Team at SLR and has over 30 years experience in the assessment of groundwater and surface water environments. This has included the assessment of numerous mineral extraction planning applications and review of old mineral permissions for the extraction of sand and gravel.

13.2 Introduction

13.2.1 The report presents an assessment of the potential changes (impacts) of the proposed development at Water Oakley on the water environment, specifically the potential of the proposed development scheme to effect groundwater and surface water flow regimes, water quality and flooding.

13.2.2 The assessment has involved the completion of a detailed site investigations and a desk study to establish current baseline geological, hydrological and hydrogeological conditions. Measures to avoid and mitigate against any potential adverse changes resulting from the proposed development scheme have been identified. An evaluation of the residual significance of these impacts was then completed.

13.2.3 The assessment took into consideration current guidance, legislation and publically available information from a wide range of sources. Technical staff at the Environment Agency and Royal Borough of Windsor and Maidenhead were also consulted.

13.3 Baseline Conditions

13.3.1 The mineral deposit to be extracted at the proposed quarry is the Kempton Park Gravel Member This is typically described as dense to very dense sandy sub-angular to rounded fine to coarse flint gravel. It ranges in thickness up to c.5.4 metres, with an average thickness across the site of c.3.0 metres.

13.3.2 The Kempton Park Gravel Formation extends throughout the surrounding area to the north, west and east of the application site, but lenses out completely to the south. It has been extracted within former quarries to the immediate west and north-west and these quarries have been restored via landfilling with a range of waste types (inert to hazardous).

13.3.3 The Kempton Park Gravel Formation has high permeability characteristics and so comprises an aquifer, with groundwater flow taking place in an easterly direction across the application site toward the River Thames. Groundwater flow is constrained by the Bray (Stroud Farm) Landfill Site (to the immediate west) and the historic D and H Reclamation Landfill Site (to the immediate north-west), due the lower permeabilities of the associated landfilled materials and lining systems (where present).

13.3.4 Groundwater levels within the groundwater boreholes monitoring the Kempton Park Member aquifer at the application site range between 0.77m and 5.06m below ground level. The aquifer is typically confined by higher groundwater elevations below the western (up-gradient) part of the site, and unconfined below the eastern (down-gradient) part of the site.

13.3.5 The nearest licensed groundwater abstraction that utilises the Kempton Park Member aquifer is located c.350m to the north of the site.

13.3.6 The Kempton Park Gravel Formation is overlain by overburden which is typically described as silty and sandy clay with variable gravel content. The overburden ranges in thickness between 1.3 and 3.0m, with an average thickness of 2.1m across the site. Effective recharge at the site is restricted by this horizon.

13.3.7 The Kempton Park Gravel Formation is underlain by the London Clay Formation, which is typically described as very stiff grey silty clay.

13.3.8 The London Clay Formation and overburden do not comprise aquifers given their clay dominated composition and associated low permeability which significantly restricts water flow within and through these deposits.

13.3.9 Groundwater quality within the Kempton Park Member aquifer is typically very good, although it may be slightly impacted by leachate migration from the adjacent landfill sites, given elevated ammoniacal nitrogen and sulphate concentrations within the monitoring boreholes located along the western (up-gradient) boundary of the site.

13.3.10 The site is located outside Flood Zones 2 and 3, and so there is a ‘low probability’ of fluvial flooding (i.e. less than a 1 in 1000 (0.1%) annual probability of flooding from rivers). There is a well-developed surface water network within the immediate vicinity and along the western and south-eastern perimeters of the site.

13.3.11 These surface water features are not classified as main rivers, are mainly seasonal and fed by surface water runoff from their catchments including the site. The areas immediately adjacent to these features are at ‘low’ to ‘high’ risk of surface water flooding. They drain northwards or eastward to join the River Thames, which is located within c.300 metres to the north of the site boundary at its closest point and flowing in a south-easterly direction. The River Thames is classified by the Environment Agency as a ‘Main River’.

13.3.12 Surface water quality is typically good and there is evidence that this network is in hydraulically connectivity with the Kempton Park Member aquifer across the northern parts of the site.

13.4 Potential and Predicted Environmental Impacts

13.4.1 The main aspects of the proposed development that have the potential to affect the water environment are as follows:

- excavation and redistribution of soils, overburden and sand and gravel during the operational and restoration phases, with the potential for spillage of contaminating liquids from the plant operating at the quarry and the generation of suspended sediment within surface water runoff and groundwater.
- operational and extraction activities at the quarry, with the resulting changes to the hydrogeological and hydrological regimes including flood risk at and within the immediate vicinity of the site
- restoration of the extraction areas using imported inert infill materials and site-derived sub and topsoils to pre-development ground levels, with potential effects on the groundwater and surface water quality, and flood risk at the site and adjacent areas.

13.5 Mitigation of Impacts

13.5.1 The following best practice measures and safeguards have been built into the proposed development design to prevent any direct or indirect significant effects associated with mineral extraction and restoration on groundwater and surface water flow regimes and quality:

- The Kempton Park Gravel aquifer would be worked ‘wet’ (i.e. without any dewatering), following stripping of the soil and overburden to form a series of perimeter screening bunds.
- The relevant Pollution Prevention Guidelines and CIRIA guidance would be followed.
- New site tracks would be kept as free as possible from excessive mud deposits.
- Good site/surface water management practice employing sustainable drainage systems (SuDS) comprising grassed swales, settlement ponds, temporary sumps and catchpits would be followed throughout the mineral extraction and restoration phases.
- No permanent foul drainage is included within the proposed scheme.
- An Environmental Management Plan, which identifies environmental measures throughout the life of the quarry, would be followed.
- The Environmental Permit for the restoration of the quarry by inert infill materials would identify measures, including stringent Waste Acceptance Criteria, to minimise the risk of any non-inert waste from being accidently deposited at the Site.

- The restoration scheme would reflect pre-development conditions by preventing increases in runoff, modifications to local surface drainage patterns and flow, increased erosion and sedimentation and change in flood risk within and downstream of the site.

13.5.2 In addition to the above the following mitigation measures have been included within the scheme design.

13.5.3 Prior to the start of mineral extraction and infilling, a permanent c.10m thick low permeability sidewall seal/attenuation layer would be installed around the perimeter of each phase, extending down from ground level and keyed into the London Clay Formation. This would be constructed from site-derived overburden material and so would not contain any contaminated materials. It would effectively isolate the mineral extraction and restoration areas from the surrounding hydrological and hydrogeological systems, and so prevent any significant off-site fluctuations in groundwater levels from developing while gravel extraction and restoration are taking place. This sidewall seal/attenuation layer would also from the required geological barrier, which is a necessary engineering measure specified by the Environmental Permit. The London Clay Formation would form the basal geological barrier that is also a requirement of the Environmental Permit.

13.5.4 The perimeter seal/attenuation layer would be constructed within a linear excavation, without any significant dewatering being undertaken. The length and width of this excavation would be minimised to ensure that separation (and resulting variation in permeability) of the site-derived overburden materials during placement does not take place. This would be confirmed by a CQA programme which would be determined during the Environmental Permitting process, in agreement with the Environment Agency. It is noted that the c.10m thickness of the sidewall seal/attenuation layer is significantly greater than 1m thickness (at a maximum permeability of $1x10^{-7}$m/s) that is stipulated by the Environmental Permitting Regulations (2010), and so substantial conservatism has been built into the design of the geological barrier to be installed at the site.

13.5.5 A permanent combined groundwater and surface water drain would be constructed progressively in stages around the eastern, northern and western perimeters of the site. The base of this drain would be connected to the underlying Kempton Park Gravel aquifer along its full length so that groundwater can flow up into this drain from below, should groundwater elevations increase significantly within the aquifer up-gradient of each quarry phase during quarrying and restoration. This would be necessary given that the lower permeability of the permanent perimeter seal/attenuation layer and the inert infill materials used to restore the quarry void would impede groundwater flow across the site within the Kempton Park Gravel aquifer.

13.5.6 Infiltration of this groundwater and surface water captured by the drain can then take place into the Kempton Park Gravel aquifer where this drain extends across the unconfined part of the aquifer underlying the north-eastern and eastern (down-gradient) areas of the site. Groundwater level monitoring data have confirmed that

the maximum groundwater elevations below these north-eastern and eastern sections of the drain lie at least c.1m below the upper boundary of the Kempton Park Gravel aquifer, and so infiltration of drain water back into the aquifer would be possible.

13.6 Potential Residual Impacts

13.6.1 The assessment has confirmed that the proposed development scheme would not have any significant residual or cumulative effects (impacts) on the water environment at the site and surrounding area.

13.7 Conclusions

13.7.1 Sufficient information has been gathered, via site specific investigations and desk study, to develop a robust conceptual model identifying baseline (pre-development) hydrological and hydrogeological conditions at the site and surrounding area. This conceptual model has been used to assess potential effects (impacts) associated with the proposed development on the sensitive water receptors. It has also been used to determine appropriate mitigation measures that are required to be built into the development scheme in order to ensure that the proposed development does not have any significant effects (impacts) on the water environment (i.e. water quality, flow regime and risk of flooding) at or within the vicinity of the site.

13.7.2 The assessment has confirmed that there would be no significant residual or cumulative effects (impacts) associated with the proposed mineral extraction or restoration phases on the hydrogeological and hydrological receptors at the site or in the vicinity. A summary of the sensitivity of receptors, magnitude of change, significance of effects, and resulting residual magnitude of effects is provided within **Table 13.1** below.

Potential Effects	Identified Receptors	Direct or Indirect / Short or Long Term Effect	Receptor Sensitivity	Magnitude of Change	Effect Pre-Mitigation	Significant / Not Significant	Mitigation?	Residual Effects
Surface Water and Groundwater Flow Regimes & Flooding								
• Modifications to surface and groundwater flow regimes, water levels and velocities. Ground settlement. • Flooding	Surface water drainage system and Kempton Park Gravel aquifer in immediate vicinity of application site	Direct and Indirect / Permanent / Short to Long Term	High	Negligible	Negligible	Not Significant	The inclusion within the scheme of appropriate water management measures (permanent perimeter clay seal / attenuation layer, perimeter surface water and groundwater drain and SUDS) will be sufficient. No additional mitigation measures are considered necessary.	None
Surface Water and Groundwater Quality								
• Increase in suspended solids due to quarrying & associated earthworks. • Potentially contaminating liquids from historic landfills, materials management, vehicles & machinery due to accidental spillage or 'rogue load' of non-inert infill materials.	Surface water drainage system and Kempton Park Gravel aquifer in immediate vicinity of application site	Indirect / Temporary / Short to Medium Term	High	Negligible	Negligible	Not Significant	Inclusion of the permanent perimeter seal / attenuation layer and SUDS, management and maintenance systems, storage and handling procedures, spill response plan, traffic management, and conformance with the Environmental Permitting Regulations (2010), will be sufficient. No additional mitigation measures are considered necessary.	None

Table 13.1 Summary of Surface Water and Groundwater Effects

14.0 NOISE IMPACT ASSESSMENT

The full-length version of the Noise Impact Assessment is included in the Environmental Statement (Technical Studies) in Volume 3.

14.1 Author of the Report

14.1.1 The assessment was prepared by Robert Storey BEng PhD MIOA of WBM. He joined WBM in 2007 after working in acoustic consultancy and environmental health since 1999. Robert is involved mainly in environmental noise, mineral extraction, waste and industrial projects, including surveys, routine noise monitoring and assessments. He is experienced in noise modelling using SoundPLAN for transportation, industrial and environmental sources.

14.2 Introduction

14.2.1 Summerleaze is applying for planning permission for the phased extraction of approximately 1.7 million tonnes of sand and gravel over a period of 8 years from land at Water Oakley near Maidenhead in Berkshire. After extraction, the void would be progressively infilled with imported inert material and restored.

14.2.2 The mineral extracted would be transported off-site to the existing plant site at Monkey Island approximately half a mile away by means of road going HGV's.

14.2.3 There would be no processing on the site itself.

14.3 Baseline Conditions and Noise Limits

14.3.1 Baseline noise surveys were conducted on three days at five locations representative of the nearest noise sensitive properties to the site. Twenty-five sample measurements were made over three visits which took place on Wednesday 10 May 2017, Tuesday 16 May 2017 and Monday 22 May 2017.

14.3.2 A data logging sound level meter was also installed at 8 Ferndale Park from Wednesday 10 May 2017 until Tuesday 16 May 2017.

14.3.3 Noise levels were generally controlled by road traffic noise, aircraft noise related to Heathrow Airport, birdsong, local activity and vehicle movements.

14.3.4 Based on the baseline noise survey work conducted in May 2017 and the advice contained in Paragraphs 21 and 22 of the Planning Practice Guidance (PPG), site noise limits at the nearest noise sensitive premises for routine and temporary operations have been suggested.

14.3.5 No operations are to take place on site outside the normal operating hours.

14.4 Potential and Predicted Environmental Impacts

14.4.1 Noise levels arising from the proposed workings have been calculated and compared with the site noise limits at the nearest noise sensitive properties to the site. The main activities that would take place on the site during normal working hours are:

- Extraction of mineral by means of a 360^{o} excavator.
- Transport of the extracted mineral from the extension area to the Monkey Island processing plant site by means of road going HGV's on the proposed access road.
- Processing of the extracted mineral would take place off-site at the existing processing plant at Monkey Island and was therefore not included in the assessment.

14.4.2 Once extraction of the mineral in each phase is completed, the area is to be infilled with imported inert material and restored. The infilling process would involve:

- Importing of inert waste by means of road going HGVs.
- Tipping of imported material into the void from the HGVs.
- Grading of the infill material by means of a dozer.

14.4.3 Prior to extraction in each phase, a perimeter clay seal would be created for drainage purposes. This activity would be considered a routine operation and is subject to the same noise limits as for extraction and infilling.

14.4.4 There would be no routine activity on site outside normal working hours, i.e. during the period 19:00 to 07:00.

14.4.5 Site noise calculations have been undertaken for eight receiver locations and compared with the site noise limits for the daytime period when activity would be taking place on site.

14.4.6 The nearest noise sensitive premises to the site for which calculations relating to routine operation of the site were undertaken were considered to be:

- Longlea Nursing Home to the south.
- Down Place Lodge and Oakley Court Lodge to the north-east.
- Queen Acre Cottage and Queen Acre Caravan Park to the north.
- Glenesk and The Guild House to the north-west.
- Ferndale Park to the west.

14.4.7 The nearest edge of any of the proposed workings associated with mineral extraction/infilling is about 80 metres away.

14.4.8 Bunding was included in the calculations to a height of 3 to 5 metres above local ground level as proposed in the phasing plans for the site.

14.4.9 Calculated site noise levels for simultaneous extraction and infilling operations on the land at Water Oakley or the creation of the clay perimeter seal indicate noise levels

due to these activities of between 46 and 53 dB $L_{Aeq,\ 1\ hour\ free\ field}$ at the assessment locations.

14.5 Temporary Operations

14.5.1 The calculations indicate that bund formation, the formation of a perimeter drainage ditch and soil/overburden removal at the nearest points to the dwellings (30 metres from Queen Acre Caravan Park, 40 metres from Down Place Lodge/Queen Acre Cottage and Ferndale Park) would comply with the noise limit for temporary operations of 70 dB $L_{Aeq,\ 1\ hour,\ free\ field}$.

14.5.2 For temporary activity, such operations leading to these noise levels shall not exceed more than 8 weeks in any 12 month period at the nearest noise sensitive properties. This applies to the formation of the perimeter drainage ditch, bund construction/removal and soils/overburden removal and placement.

14.5.3 The calculated noise levels at the nearest assessment locations for these temporary operations, with no barrier attenuation included, are up to 69 dB $L_{Aeq,\ 1\ hour,\ free\ field}$ (at Queen Acre Caravan Park).

14.6 Conclusions

14.6.1 The noise assessment report sets out calculated noise levels arising from activity within the proposed extraction and infill extension area. Calculated noise levels for the nearest dwellings are presented for inspection.

14.6.2 Noise limits for the site are suggested based on existing background noise levels and current advice from the government contained in the National Planning Policy Framework and Planning Practice Guidance dated March 2014.

14.6.3 The calculated site noise levels for routine daytime operations comply with the suggested site noise limit at all of the receiver locations.

14.6.4 For this site, since the proposed operations conform to the advice set out in the NPPF Planning Practice Guidance dated March 2014 it is considered that the site can be worked while ensuring noise emissions do not have an unacceptable adverse impact on the environment.

15.0 AIR QUALITY ASSESSMENT

The full-length version of the Air Quality Assessment is included in the Environmental Statement (Technical Studies) in Volume 3.

15.1 Author of the Report

15.1.1 The assessment of air quality has been prepared by Vibrock Limited. Vibrock Limited is a leading independent environmental consultancy assessing environmental impacts of mineral extraction. Vibrock Limited provide monitoring services for air quality around mineral extraction site and assessments for inclusion in Environmental Impact Assessments.

15.1.2 Steven Edwards, the author of this report, works within the consultancy section and has 7 years of experience with the company. This has included the assessment of mineral extraction planning applications.

15.2 Introduction

15.2.1 This report presents an assessment of the air quality impacts from the proposed development in terms of dust and very fine particles (PM_{10} and $PM_{2.5}$) at properties surrounding the site. Meteorological data and air quality data local to the site has been assessed, the local dust sensitive receptors identified and mitigation measures proposed to minimise any dust impact.

15.3 Baseline Conditions

15.3.1 The closest residential receptors to the development have been considered in the assessment: The Guild House to the north and west of the proposed development, Queens Acre Caravan and Camp Site to the north of the proposed development, Longlea Nursing Home to the south, Monkey Island Lane to the west of the haul route and Down Place Farm to the north of the proposed extraction area.

15.3.2 Meteorological data from Heathrow (Greater London) has been assessed in terms of windspeed and rainfall data. The predominant wind was from the south west quadrant. Rainfall greater than 0.2mm per day effectively reduces the potential for windblown dust and the total number of days with rainfall < 0.2mm was 132.9 per annum. Air quality data has been accessed from the DEFRA website. Environmental dust levels have been monitored at the closest residential properties and was found to be well below the generally accepted nuisance criterion.

15.4 Potential and Predicted Environmental Effects

15.4.1 Many of the operations and activities within and around the proposed extraction area have the potential to generate dust, however there is no processing plant on site and the mineral would contain a high moisture content.

15.4.2 The following activities are discussed within the report: Site Preparation and Restoration, Mineral Extraction, Materials Handling, On-site Transportation and Off-site Transportation.

15.4.3 The Meteorological data from Heathrow has been analysed in order to establish the number of dry windy working days when dust could be blown from the site towards surrounding receptors in the absence of mitigation measures.

15.4.4 Consideration is given in the report to the potential loading of PM_{10} from the development, the distance between the dust generating source and the receptor and the mitigation measures required in order to minimise the possibility of a dust event. With regard to PM_{10} and $PM_{2.5}$ dust levels from the site, analysis has been made of the air quality data. This has been combined with the extra burden of 1 µg/m³ for the quarry. These results show that the Air Quality Objectives would not be exceeded and therefore the air quality would not be significantly affected by this development.

15.5 Mitigation of Impacts

15.5.1 Mitigation measures are discussed within the report for the potential sources of dust identified. The mitigation measures are summarised towards the rear of the report and are presented in **Table 15.1** below.

Operation	Dust Control Measures
Soil/overburden removal, storage and replacement:	• Minimise the duration of activity • Avoid soil handling during adverse weather • Soil bunds graded to minimise wind-blown dust and seeded • Progressive restoration to minimise the exposed mineral area • Restrict access to restored areas • Temporary cessation of activities in the event of unacceptable dust emissions in the vicinity of receptor properties • Minimise drop heights for loading and tipping • Siting of storage mounds to take advantage of shelter from wind • Retain boundary vegetation where possible
Mineral Extraction:	• Drop heights to be minimised at all times • All vehicles checked for overloading to reduce spillages • Temporary cessation of activities in the event of unacceptable dust emissions in the vicinity of receptor properties

Haul roads and access roads:	• All loaded HGVs leaving site to be securely sheeted • Controlled use of fixed haul routes • Haul routes to be regularly maintained by grading to minimise dust generation • Optimise separation distances to receptors • Speed controls to be enforced • Water bowsers to be used as required • Vehicle exhausts to be angled upwards • Regular maintenance of plant and equipment • Regular sweeping of access road and surfaced areas

Table 15.1 Dust Control Measures

15.6 Potential Residual Impacts

15.6.1 The dust mitigation measures identified within the report would be implemented together with the procedures within the dust management section of the report in order to minimise the possibility of a dust event occurring.

15.7 Conclusions

15.7.1 The report concludes that it is unlikely that any significant decrease in local air quality would occur due to the proposed operations at Water Oakley. Any dust occurrence event would be limited and of short duration and would be minimised by implementation of the dust control recommendations. The operation of the site would have a negligible impact on adjacent residential properties.

15.7.2 With regard to PM_{10} dust levels from the site, analysis has been made of the air quality data. These results show that Air Quality Objectives would not be exceeded and therefore the air quality would not be significantly affected by this development.

15.7.3 The operation of the site would have a negligible impact on adjacent residential properties. The likelihood of a short-term dust event occurring is very low.

16.0 HIGHWAYS

The full-length version of the Transport Statement is included in the Environmental Statement (Technical Studies) Folder.

16.1 Author of the Report

16.1.1 The Transport Statement was prepared by the Hurlstone Partnership Limited, a specialist highway consultancy. The Hurlstone Partnership Limited has extensive experience in the assessment of transport impacts associated with a wide range and scale of development types, including mineral extraction and processing operations.

16.1.2 Jeremy Hurlstone, the author of this report, is a Director of the Company and has 30 years of experience in the assessment of highway impact for a range of development types and scale. This has included the assessment of numerous mineral and waste developments resulting in HGV activity on road networks.

16.2 Introduction

16.2.1 This report presents an assessment of the potential transport impacts of the proposed mineral extraction at Water Oakley, specifically the effects of access and transportation on the local road network.

16.2.2 Summerleaze currently operates a satellite sand and gravel processing plant located off Monkey Island Lane, which is supplied by as-raised mineral sourced from various extraction sites via the local road network, including the A308 and Monkey Island Lane.

16.2.3 Summerleaze is seeking planning permission to extract 1.7 million tonnes of sand and gravel from land to the south of the A308 Windsor Road to supply the plant on Monkey Island Lane, which is approximately 885m (0.55 miles) distant.

16.2.4 Extraction and transport of the as-raised sand and gravel from the site would take place over a 7 year period at a rate of approximately 250,000 tonnes per annum.

16.2.5 All of the sand and gravel would be transported by HGV along a short, 570m length of the A308 to Monkey Island Lane, where it would be processed and subsequently distributed in accordance with the existing, permitted activities at the Monkey Island Lane plant.

16.2.6 The extraction area would be progressively infilled and restored to original ground levels for agricultural use over a 7 year period at the same rate using inert construction, demolition and excavation waste arising from local development projects, together with the stripped overburden, which would be retained on site for subsequent re-use as part of the restoration scheme.

16.2.7 The proposed infilling would commence after the start of sand and gravel extraction, giving an overall project life around 8 – 9 years in terms of HGV activity on the road network.

16.2.8 The proposed operating hours are Monday to Friday between 07:00 – 18:00 hours with no working on Sundays or Bank Holidays and only maintenance work as and when required, but no extraction or infilling, on Saturday mornings.

16.2.9 The significance of the transport impacts from the proposed development are dependent upon the adequacy of the proposed site access, the quantum of material produced, the duration of operations and the distribution of traffic around the local highway network. The impact of the development has been assessed with regard to these matters.

16.3 Baseline Conditions

16.3.1 At present, material is imported to the Monkey Island Lane plant site for processing from extractions sites located further afield than the proposed extraction area, which is currently in agricultural use.

16.3.2 The imported as-raised material is transported along the local highway network before travelling along the A308 and through its junction en-route to the site, where it is processed and subsequently sold/distributed by HGVs via the same routes.

16.3.3 The permitted activities at Monkey Island Lane would not be affected by the proposed development beyond the fact that the imported material would be sourced more locally than it is at present.

16.3.4 A review of the local highway network, including traffic and collision data provided by the Council, confirms that the existing activities are satisfactorily and safely accommodated.

16.4 Potential and Predicted Environmental Impacts

16.4.1 The proposed development would result in the creation of a new access to the A308 and additional traffic travelling the short 570m distance between it and the existing Monkey Island Lane junction.

16.4.2 Cumulatively, it was established that for a 5 year period when extraction and infilling activities overlap, on the short 570m section of the A308 between the proposed site access and Monkey Island Lane, an average of 234 HGV movements (117 in/117 out) per day would occur, assuming all of inert fill traffic approached the site via the northwest and therefore travelled along the same section of the A308 as the vehicles exporting sand and gravel to the processing plant. This equates to an average of 21 HGV movements per hour over the 11 hour working day.

16.4.3 By comparing the impact of the highest cumulative development traffic flow against the observed vehicle movements on the network provided by the Highway Authority, it was apparent that an increase of 234 movements per day represents just 1.2% of the average weekday traffic flow and just 16.7% of day to day variation.

16.4.4 Similarly, by reviewing the AM peak hour traffic flows, the cumulative peak average of 21 HGV movements associated with the development on the short section of the A308

between the site access and Monkey Island Lane, assuming a 100% directional distribution, represents just 1.4% of the average AM peak hour flow and 9.3% of the observed daily variation in traffic flow during the AM peak hour.

16.4.5 The same 21 HGV movements equate to 1.3% of the average PM peak hour flow and 15.8% of the observed day to day variation in traffic flow during the PM peak hour.

16.4.6 When assessing the HGV flows in isolation, it is also apparent that even where the highest HGV flow associated with the proposed development occurs, 21 HGV movements represent just 48.8% of the observed hour to hour variation of 43 HGV movements experienced and accommodated on the A308.

16.4.7 It is therefore apparent that in the context of the existing baseline traffic flows, even assuming there is no offset against the existing HGV movements importing sand and gravel to Monkey Island Lane, the impact of the proposed development HGV traffic would not be significant and would fall well within the range of normal day to day variations observed on the route.

16.4.8 When offsetting the existing sand and gravel imports against the development traffic and allowing for a directional split to the northwest and southeast for the vehicles importing inert materials, the significance of the development traffic would be further reduced and could be considered beneficial when taking into account the reduced distances along the network sand and gravel would be transported by sourcing the as-raised material so close to the established processing plant.

16.4.9 In addition to the HGV traffic, there would also be trips associated with the four members of staff employed within the site when extraction and infilling activities coincide. However, as a result of the operating hours, their movements would occur outside the peak hour periods and would not have a material impact on the highway network even if they chose not to take advantage of the local pedestrian/cycle routes and bus services.

16.4.10 A review of the proposed access and local highway network has been undertaken to confirm that the access would achieve appropriate design standards and that the existing road network could safely accommodate the development traffic.

16.5 Mitigation of Impacts

16.5.1 It was established that transporting as-raised material extracted from the proposed site to Monkey Island Lane for processing would result in a net saving of between 929,000 and 1,858,000 HGV miles on local roads over the 7 year duration of the proposed extraction operations when compared with transporting the same quantity of material from the alternative sources identified by the operator; indicating a significant reduction in the need to travel, which supports sustainable travel at its basic and fundamental level as a result of the proximity principle.

16.5.2 This would offset the increase associated with importing restoration material to the extraction area, thereby reducing the impact which was found to be acceptable with no allowance for offsetting the existing HGV movements.

16.5.3 The proposed new access would be designed and constructed to current standards in accordance with the Highway Authority's requirements. The Highway Authority has been engaged in pre-application consultations to agree the location and form of the proposed access.

16.5.4 Beyond the routine maintenance of the proposed access and visibility splays to ensure highway safety is not compromised at the access position, maintenance of the on-site plant, hauliers HGVs and access roads to ensure that the movements to/from the site avoid unnecessary disruption, no further mitigation is considered necessary.

16.6 Potential Residual Impacts

16.6.1 Following completion of the extraction and restoration of the proposed development site, there are not predicted to be any residual impacts.

16.7 Conclusions

16.7.1 Having established the foregoing, the impact of the proposed development was assessed against the national planning policy transport test.

16.7.2 In circumstances where an access providing appropriate geometry and visibility to meet safe design standards could be provided to a route where even under the worst case scenario the development traffic represents a small proportion of the baseline flow and falls within existing, observed day to day and hour to hour variations, it cannot be concluded that the proposed development would result in an unacceptable impact on highway safety or have a severe residual cumulative impact. Accordingly, permission should not be prevented or refused on transport grounds.

17.0 PUBLIC RIGHTS OF WAY

17.1 Baseline

17.1.1 There are a number of public rights of way which lie within or close to the site as shown on the **Current Situation** plan and described in more detail below.

17.1.2 Public footpath number Bray/53 crosses the site for a distance of some 400 metres in a north-south direction from the A308 in the north towards the B3024 in the south.

17.1.3 Footpath Bray/51A lies along the southern boundary of the site for a distance of 900 metres from Fifield Road in the west to footpath Bray/53 in the east. Footpath 51A lies partly within the planning application boundary.

17.1.4 Footpath Bray/51B lies along the southern boundary of the site for a distance of 150 metres running in an easterly direction from footpath Bray/53 and continues some 500 metres to the south to join footpath Bray/52. Footpath Bray/51B lies partly within the planning application boundary.

17.1.5 Footpath Bray/54 lies along the eastern boundary of the site for 400 metres from the A308 and continues 400 metres to the south where it crosses footpath Bray/52 and continues in a southerly direction to the B3024 and Oakley Green. Footpath Bray/54 lies partly within the planning application boundary.

17.2 Predicted Impacts

17.2.1 Footpath Bray/53 crosses the site and would be affected by the proposed development.

17.2.2 Site operations would be undertaken in relatively close proximity to footpath Bray/54 and at a greater distance from footpaths Bray/51A and Bray/51B.

17.3 Mitigation

17.3.1 There would be a requirement to temporarily divert footpath Bray/53 for a period of time to allow the development to proceed. The diversion would be subject to a formal diversion application.

17.3.2 The proposed diversion route for footpath Bray/53 is shown on the **Phase 1** plan. In the north footpath Bray/53 would be diverted in an easterly direction parallel with the A308 as far as footpath Bray/54. In the south the diversion would be along the route of footpath Bray/51B and then would continue beyond to footpath Bray/54. The diversion would provide a link between footpaths Bray/51B and Bray/54. The diverted footpath would be reinstated along the original route following the completion of extraction and restoration.

17.3.3 No other footpaths would need to be diverted.

17.3.4 Footpath Bray/54 is separated from the proposed development by a tree screen planted some 15 years ago which provides effective separation. Inside the tree screen there would be a perimeter ditch and then a soil screen bank which would prevent views into the operational area if views were to be available through the tree screen in the winter. The soil screen bank would also limit noise and dust emissions. Extraction and infilling operations would be undertaken no closer than 25 metres from footpath Bray/54. More details are provided on the **Footpath 54 Cross section**.

17.3.5 Footpath Bray/51A lies between 100 and 150 metres from the operational part of the site and would be separated by a soil screen bank. More details are provided on the **Footpath 51B Cross section**.

17.3.6 When the site is operational signs would be provided along the adjacent footpaths informing footpath users of the presence of the site. Secure boundary fencing would be provided to prevent access and comply with the requirements of the Quarries Regulations in the form of wooden posts and sheep netting topped with plain wire.

17.4 Proposed Enhancements

17.4.1 In the restoration proposals shown on the **Restoration Concept** plan footpath Bray/53 would be reinstated through a strip of grassland between hedges and occasional trees and would provide an enhanced route.

17.4.2 The footpath diversion link between footpath Bray/51B and footpath Bray/54, along the south-eastern site boundary, would be made into a formal right of way and dedicated for public use (subject to confirmation with the Public Rights of Way team at RBWM). This additional footpath is shown on the **Restoration Concept** plan and would pass through species rich grassland and close to a proposed pond which would add interest to footpath users.

17.5 Conclusion

17.5.1 Effects on users of existing public rights of way in and near the site have been recognised and mitigation measures proposed to ensure that footpath users did not experience unacceptable impacts. Site restoration would provide an additional right of way and enhancements.

18.0 CUMULATIVE IMPACTS

18.1.1 There are a number of recent planning applications and permissions, mainly connected with minor residential alterations, in the vicinity of the Water Oakley site. There are several larger permissions which are referred to below.

Planning reference	Description	Location	Comment
15/02107	Relocation of gym	Fifield Road to the immediate south-west of the site	Approved. Views of the site would be screened by the screen banks and also tree planting around the gym. Noise levels would be controlled by the use of perimeter screenbanks. Air quality would not be reduced due to operational controls. HGVs would not travel past the gym entrance. The highway assessment has concluded there would be no cumulative impact.
17/00798	28 bed hospice	Windsor Road 700 metres to the north-west of the site.	Approved. There would be no views of the site due to intervening development and trees. Noise levels and air quality would not be affected due to the separation distance. HGVs delivering to the processing plant would not travel past the hospice entrance. The highway assessment has concluded there would be no cumulative impact.
15/01984	Redevelopment of existing buildings and new build to create 25 residential units	Bray Studios, Windsor Road 200 metres to the north of the site.	Approved. There would be no views of the site due to intervening development, proposed screen banks and trees. Noise levels would be controlled by the use of perimeter screenbanks. Air quality would not be reduced due to operational controls. The highway assessment has concluded there would be no cumulative impact.
18/01804	127 residential units	Water Oakley Farm, Windsor Road to the north of the A308.	Not yet determined. There would be no views of the site due to the proposed screenbanks and trees. Noise levels would be controlled by the use of perimeter screenbanks. Air quality would not be reduced due to operational controls. There would be no cumulative impact in highways terms.

Table 18.1 Planning applications and permissions

18.1.2 There are unlikely to be any cumulative impacts with the developments as referred to in **Table 18.1.**

18.1.3 The Borough Local Plan 2013 – 2033 Submission Version (2018) identifies several large residential schemes in the area which are identified below.

Borough Local Plan Reference	Description	Location	Comment
HA11	450 residential units	Land west of Windsor either side of the A308 800 metres to the east of the site	There would be no views of the site due to the proposed screenbanks and trees. There would be no noise or air quality impacts due to the separation distance. There would be no cumulative impact in highways terms.
HA18	100 residential units	Windsor Road adjacent to hospice 800 metres to the north-west of the site.	There would be no views of the site due to intervening development and trees. There would be no noise or air quality impacts due to the separation distance. There would be no cumulative impact in highways terms.
HA23	100 residential units	Monkey Island Lane 500 metres to the north-west of the site.	This is the Monkey Island Lane processing plant site and would not be made available for residential development until mineral processing ceased permanently.

Table 18.2 Borough Local Plan Submission Version Housing Allocations

18.1.4 There are unlikely to be any cumulative impacts arising from the potential future developments as referred to in **Table 18.2**.

18.1.5 The ES demonstrates that the environmental impacts associated with the development of the Water Oakley site are fully understood and can be mitigated where necessary.

18.1.6 No cumulative impacts from the proposals have been identified in any of the technical assessments.

18.1.7 The development of the site is in accord with the emerging local planning policies.

18.1.8 It is considered that there are no significant or unacceptable potential cumulative impacts arising from the proposed development with any existing or planned developments in the vicinity.

19.0 PUBLIC HEALTH AND CLIMATE CHANGE

19.1.1 The 2017 EIA Regulations introduced a requirement to consider public health and climate change in the EIA process to understand the potential impacts from the development on these important areas. These aspects have been included where appropriate in the individual specialist assessments that are included as part of the overall EIA.

19.1.2 The implications of the development on public health are considered in the assessments of air quality, noise and highways. The assessments concluded that there were no unacceptable impacts arising from the development.

19.1.3 Climate change was considered in the air quality and flood risk assessment which concluded that the development would not worsen any impact from climate change.

20.0 SOCIO ECONOMIC

20.1.1 The development of the Water Oakley site would have a number of positive economic effects including providing a source of high quality construction aggregates for local construction work and a facility for the disposal of inert construction wastes as well as financial and employment benefits.

20.1.2 The Monkey Island Lane plant site supplies aggregates to a buoyant construction market primarily within a 10 – 15 mile radius. Material from Water Oakley would allow this aggregate supply to be continued and would avoid material being transported to the plant site from further afield. The development of an inert infill facility would be beneficial as there are very few such sites in the area.

20.1.3 The development of the Water Oakley site represents an initial investment of over £1 million. The annual level of expenditure generated from the site whilst operational would be over £1 million per year on a variety of purchases, transport, wages, consumables, services and business rates, some of this expenditure would benefit the local economy.

20.1.4 There would be four full time jobs created on site. In addition employment at the Monkey Island Lane processing plant would be maintained and indirect or periodic employment would be provided for HGV drivers, Summerleaze support staff and various contractors providing specialist services at the site in terms construction, electrical and earthmoving work.

21.0 CONCLUSIONS

21.1.1 The Environmental Statement accompanies a planning application for the extraction of sand and gravel from land at Water Oakley and the restoration of the land back to agricultural use at original ground levels by infilling with inert materials.

21.1.2 Sand and gravel would be transported by road from Water Oakley along the A308 to the existing Summerleaze processing plant site at Monkey Island Lane less than 1km away where it would be processed and sold.

21.1.3 The Water Oakley site has been identified for sand and gravel extraction in the June 2018 Joint Minerals and Waste Plan Consultation Paper prepared for the Central and Eastern Berkshire planning authorities.

21.1.4 The development of the site has been subject to a full Environmental Impact Assessment which has considered a range of environmental aspects that could experience impact as a consequence of the development. Where necessary mitigation measures have been incorporated into the development design to ensure that any unacceptable impacts were avoided. The result of the assessments is a conclusion that there would be no unacceptable impacts from the development on the environment or on local amenity and that the development would result in a number of environmental and economic benefits.

List of Plans

Location Plan
Application Plan
Current Situation
Landscape Designations
Block Phasing Plan
Initial Development Works
Phase 1
Phase 2
Phase 3
Phase 4
Phase 5
Reception Area Layout
Office and Welfare Elevations
Borehole Location Plan
Restoration Concept
Footpath 54 Cross section
Footpath 51A Cross section

Appendices

1 Exploration Borehole Logs