



TARMAC Trading Ltd

# Wasing Quarry, Wasing Lane, Aldermaston, Reading, RG7 4LY

Waste Recovery Plan

Project no. 11655 - R01(02)

## RSK GENERAL NOTES

---

**Project No.:** 11655-R01(02)

**Title:** Waste Recovery Plan: Wasing Quarry, Wasing Lane, Aldermaston, Reading, RG7 4LY

**Client:** Tarmac Trading Ltd

**Date:** 23<sup>rd</sup> September 2022

**Office:** RSK Environment Limited, Fourways House, 57 Hilton Street, Manchester, M1 2EJ, UK

**Status:** Final

<b>Author</b>	<u>Andrea Grossey</u>	<b>Technical reviewer</b>	<u>Tim Holding</u>
Signature		Signature	
Date:	<u>23<sup>rd</sup> September 2022</u>	Date:	<u>23<sup>rd</sup> September 2022</u>
<b>Project manager</b>	<u>Tim Holding</u>	<b>Quality reviewer</b>	<u>Ellie Sanders</u>
Signature		Signature	
Date:	<u>23<sup>rd</sup> September 2022</u>	Date:	<u>23<sup>rd</sup> September 2022</u>

RSK Environment Limited (RSK) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and RSK. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by RSK for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

No part of this report may be copied or duplicated without the express permission of RSK and the party for whom it was prepared.

Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK Environment Ltd.

# CONTENTS

---

<b>1</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	Background.....	1
1.2	Consultation with Regulators.....	2
1.3	Objective.....	2
1.4	Scope.....	3
1.5	Existing Reports.....	3
1.6	Limitations.....	4
<b>2</b>	<b>SITE LOCATION AND DESCRIPTION.....</b>	<b>5</b>
2.1	Site Location and Description.....	5
2.2	Statutory and Non-Statutory Environmental Designations.....	7
2.3	Site History.....	8
2.4	Proposed Mineral Extraction on Site.....	8
<b>3</b>	<b>GROUND CONDITIONS AND ENVIRONMENTAL RISK.....</b>	<b>10</b>
3.1	Geology.....	10
3.1.1	Solid Geology.....	10
3.1.2	Superficial Deposits.....	10
3.1.3	Overburden.....	11
3.1.4	Made Ground.....	11
3.2	Hydrogeology.....	11
3.2.1	Groundwater Classification.....	11
3.2.2	Groundwater Abstractions.....	11
3.2.3	Source Protection Zones.....	11
3.2.4	Private water supplies.....	12
3.2.5	Groundwater Levels.....	12
3.3	Hydrology.....	12
3.3.1	Watercourses.....	12
3.3.2	Waterbodies, canals and drainage.....	13
3.3.3	Surface water abstractions.....	13
3.3.4	Flood Risk.....	13
3.4	Environmental Risk Assessment.....	13
<b>4</b>	<b>WASTE RECOVERY PROPOSAL.....</b>	<b>15</b>
4.1	Proposed recovery scheme.....	15
4.1.1	Backfilling and material overview.....	15
4.2	Substitution of non-wastes with wastes to produce the same outcome.....	17
4.2.1	Introduction.....	17
4.2.2	Obligation.....	17
4.3	Benefit of the scheme.....	18
4.4	Minimum volume of waste being used.....	19
4.5	Waste suitability.....	20
4.6	Standard of completion.....	22
4.7	Other benefits.....	23
<b>5</b>	<b>SUMMARY.....</b>	<b>24</b>

**FIGURES**

- Figure 1 Site Location Plan
- Figure 2 Site Layout Plan
- Figure 3 Local Designations to the site boundary
- Figure 4 Working Phase Layout

**APPENDICES**

- Appendix A RSK Service Constraints
- Appendix B EA Screening Report
- Appendix C Design Drawings - detailing excavation and restoration of the site
- Appendix D RSK's Environmental Risk Assessment (ERA)
- Appendix E Restoration Plan and Landfill Volumetrics
- Appendix F Planning Decision Notice and Section 106 agreement

# 1 INTRODUCTION

---

RSK Environment Limited (RSK) was commissioned by Tarmac Trading Ltd (the 'Client') to produce a Waste Recovery Plan for the land at Wasing Quarry off Wasing Lane, Aldermaston in Reading, hereafter referred to as the 'Site'.

This Waste Recovery Plan has been produced to form a package of supporting documentation for the application for a Bespoke Environmental Permit for the Wasing Quarry site which will be used for the importation of waste materials to restore the land following several phases of mineral extraction.

## 1.1 Background

Land at Wasing Quarry has been considered suitable for the extraction of sand and gravel to meet the required demand for mineral workings within the Kennet Valley.

Following detailed assessment of the site and consideration of other local sites, Tarmac Trading Ltd (who hold the rights to develop the minerals owned by the Wasing Estate) intend extract the sand and gravels reserves beneath the site for commercial use.

The site will be developed across three phases, with working of each phase on a progressive basis over a 13-year period, meaning areas will be excavated and restored before moving to the next phase, minimising the area of disturbance.

Proposals will comprise the excavation and removal of the sand and gravel with restoration following using imported inert materials over a four-year period to return the majority of the area back to farmland with some water bodies, contributing to biodiversity and flood storage capacity within the valley.

Restoration of the site has been designed to reflect the objective of the Kennet Valley Restoration Strategy with site restored levels broadly reflecting those seen today. Screening bunds (used for noise and visual protection of the site) will all be removed on completion of the works and incorporated into the restoration of the site.

Access for the site from the A340 (north of Aldermaston Village) will be included within the development proposals as will improvements to the existing bridge across the River Enborne.

Planning has been approved for the site by West Berkshire Council (in August 2013), which extends to 104 hectares (of which c.50 hectares will be excavated and restored) and will include ancillary buildings (site office, secure and surfaced compound, weighbridge etc) located in the east of the site. It is anticipated that some 200,000 tonnes per year extraction will be achievable with a similar input of reclamation materials.

The materials required to restore site levels will comprise the importation of locally sourced waste / natural materials that would be classified under Waste Acceptance Criteria testing as 'Inert'. As a sustainable approach, the reuse of waste materials is considered environmentally beneficial by reducing the use of virgin material and the need for landfill disposal.

In order to accommodate this proposal and deposit waste at the site, the Environment Agency (EA) have indicated that an Environmental Permit for waste recovery (Deposit for Recovery or DfR) will be required.

## 1.2 Consultation with Regulators

A request for pre-application information has been made to the Environment Agency (under reference EPR/LB3106TY/A001) to initiate the intent to apply for the Environmental Permit and seek an up-to-date screening report and maps (as part of their service).

Approval for the scheme was given by West Berkshire County Council in August 2013, under planning reference 12/01220/MINMAJ. The scheme was granted subject to a number of conditions, of which several relate to restoration of the site including:

- Inert construction, demo and excavation waste and soils are only approved for use in land reclamation;
- The reclamation operations shall be undertaken so that no rocks/large stones or other material exceeding 150 mm in any dimension or other deleterious material likely to cause physical obstruction to cultivation and maintenance of the surface to be restored, are placed within one metre of the surface of the deposited reclamation material;
- Reclamation boundaries to be marked out with pegs;
- Scheme of reclamation and monitoring (to ensure that groundwater flow within the site is maintained to reflect the existing groundwater movement) to be submitted and approved by the Local Planning Authority;
- Restoration Scheme detailing steps to bring the land to the required standard for agriculture prior to the commencement of the first phase of subsoil spreading shall be submitted and approved by the Local Planning Authority;
- Phased Restoration Landscaping Plan for each phase (in alignment with the principals set out on 0702/W/R/2 dated 4/12/12), shall be submitted to and approved by the Local Planning Authority;
- Landscape (and Ecological) Management Plan detailing long term design objectives, management responsibilities and maintenance schedules for a minimum period of 10 years to be submitted to and approved by the Local Planning Authority;
- Scheme of subsoil placement following the principles set out in the Defra guidance for successful reclamation of minerals and waste sites, shall be submitted to and approved by the Local Planning Authority; and
- Scheme of topsoil (detailing a minimum cover depth of 200 mm over a 'ripped' subsoil surface) shall be submitted to and approved by the Local Planning Authority.

## 1.3 Objective

The main objective of this Waste Recovery Plan is to demonstrate that the scheme is a waste recovery operation in that waste accepted on site is suitable for re-use under the development scheme as referenced in **Section 1.1** above and the import and reuse of

locally sourced waste materials would provide a sustainable and environmentally beneficial approach by recovering local wastes, avoiding landfill disposal and reducing the use of virgin material.

## 1.4 Scope

The scope of the Waste Recovery Plan has been designed with consideration of Environment Agency waste recovery plans and permit guidance (<https://www.gov.uk/guidance/waste-recovery-plans-and-permits> 2017), BS 10175: 2013 (BSI, 2013) and guidance on land contamination reports issued by the Environment Agency (2016) .

This document has been written to demonstrate that the re-use of wastes as part of the development at the site complies with the Definition of a Waste Recovery Operation as follows:

- The development could go ahead using non-wastes to get the same outcome;
- There is an obligation to do the work;
- Wastes will only be used in the minimum quantities necessary to achieve the proposed development scheme;
- Waste is suitable (physically and chemically) for its intended purpose and won't cause pollution; and
- Wastes will be used in accordance with the requirements for backfilling and restoration of the areas quarried for the commodity of natural sands and gravel and completed to an appropriate standard.

Much of the relevant detailed information to support these proposals is provided in various associated reports and correspondence, which are referenced and contained within the appendices to this report. It is intended that this report, together with other supporting documentation and consents will form part of an application for a Bespoke Environmental Permit to allow for use of waste within the proposed scheme.

## 1.5 Existing Reports

The following reports for the site have been completed by various consultants. Relevant information from these sources has been gleaned to allow better interpretation of the site and underlying ground conditions:

- Envireau Water, Wasing Quarry: Hydrological Impact Assessment (HIA), reference P21-253 Tarmac Wasing/Woolhampton\ RPT Wasing Quarry HIA, dated 31/3/2022
- D.K. SYMES Associates, Environmental Statement for Lower Farm Wasing dated May 2012;
- RSK Ltd, Environmental Risk Assessment: Lower Farm, Wasing Lane, Aldermaston, report ref 11655-R02 (02), Dated September 2022; and
- Environment Agency Pre-Application Screening Report dated 1<sup>st</sup> March 2022 (centred on Nation Grid Reference (NGR) SU 57992 65659).

Reference to the above reports has been made throughout this Waste Recovery Plan where relevant information pertaining to the site has been cited. Those reports, of which are appended to this one are detailed within the relevant report sections.

Further details on the proposed scheme have been included in **Section 3** alongside an outline of the sites Environmental Risk.

## **1.6 Limitations**

This report should be considered in the light of any changes in legislation, statutory requirement or industry practices that may have occurred subsequent to the date of issue.

The comments given in this report and the opinions expressed are based on the ground conditions interpreted from preceding investigations completed by 'others' including intrusive site work and on results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by investigations and therefore could not be taken into account.

The comments given in this report are subject to RSK's 'Service Constraints' provided in **Appendix A**.

## 2 SITE LOCATION AND DESCRIPTION

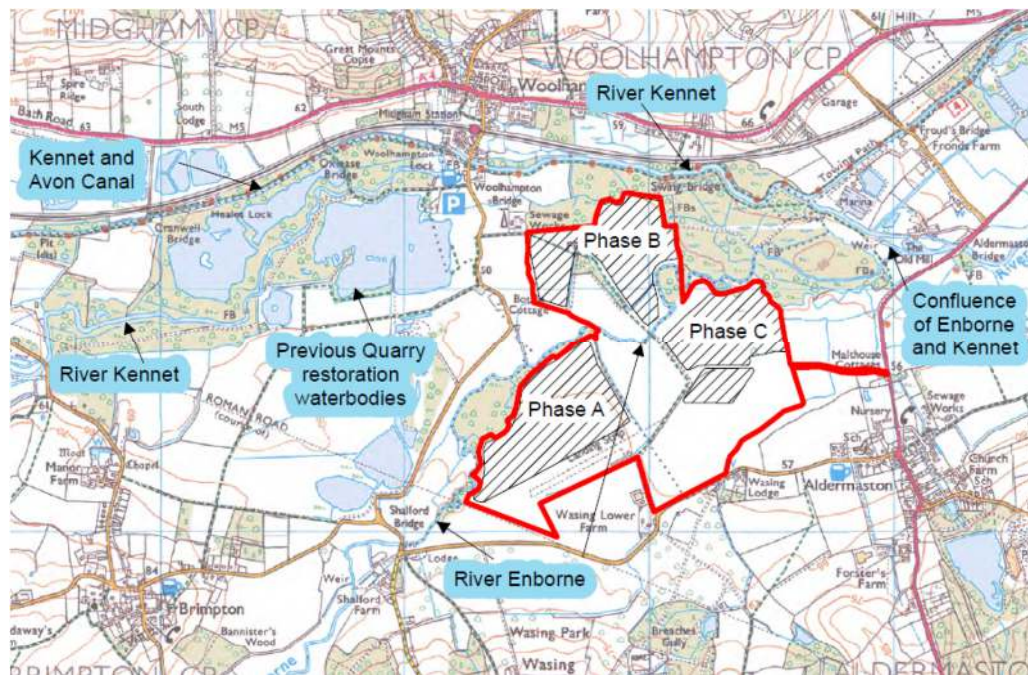
### 2.1 Site Location and Description

The site is located at Lower Farm on Wasing Lane in Aldermaston in Reading as identified on **Figure 1**. The site, owned by the Wasing Estate, extends to 104 hectares of greenfield land (as outlined in **Picture 1** below).

The site is currently characterised by agricultural farmland, comprising fields lined by various trees, wooded areas (to the north and northeast) and hedgerows. There are no residential properties or farms present within the site boundary, however an airstrip and associated storage sheds are located towards the south of the site area.

The River Enbourne flows north-eastwards across the centre of the site area, with several foot bridge crossing points. The river is fed from several smaller drains towards the north and west.

A temporary raised office building and small compound area with weighbridge has been constructed on the eastern side of the site, close to an area proposed as a new access route into the site.



**Picture 1. Site boundary**

Offsite to the north, an area of woodlands and dense reed beds (designated an SSSI) are present abutted against the southern bank of the River Kennet (100m north of the site). This is fed by a network of interjoining drains and tributaries.

The site is bound by Wasing Lane to the south, with Station Road running parallel to the western boundary.

Several waterbodies, associated with former sand and gravel extraction (to the west) are located within close proximity of the sites western boundary. A layout of the site area is presented as **Figure 2**.

The nearest residential property to the site boundary is a small collection of large homes on Wasing Lane approximately 25m south. Lower Farm, a single property located slightly west of the southern boundary (on Wasing Lane) is at a distance of approximately 55m and marks the access point for Brimpton Airfield.

Towards the eastern side of the southern boundary another collection of residential properties are present (approximately 210m south-east of the site), before the town of Aldermaston. Aldermaston, Woolhampton and Wasing are located to the east (500m), north (600m) and south (650m) respectively.

Aldermaston Primary School is located 220m to the southwest of the southern boundary.

With respect to these residential dwellings identified along the sites southern boundary, it is understood that the area nearest to these to be excavated (and restored) lies some 250m/300m to the north (Phase C5) encased behind a 3m high topsoil storage bund (visually screening the works from Wasing Lane).

A Sewage Works is present approximately 25m from the north-western boundary, with a residential property also close to the sites western boundary (approximately 150m west) identified as Bottle Cottage.

Features of significance (as detailed above) within the vicinity of the site are presented on **Figure 3**.

The area surrounding the site is as detailed in **Table 1**.

**Table 1: Site setting**

<b>To the north:</b>	Woodland (designated as a Local Wildlife Site) and marshland areas are present along numerous parts of the northern boundary. The Kennet and Avon canal and River Kennet flow as one watercourse directly north of the site, however some 400/500 m up and downstream, the river and canal are separate features. A small marina is present approximately 450 m to the northeast of the site at this junction.
<b>To the east:</b>	Agricultural land bounds the east of the site with residential properties and a garden centre beyond adjacent to Basingstoke Road (A340) and wooded area to the northeast.
<b>To the south:</b>	Wasing Lane bounds the south of the site, with buildings associated to the Brampton Airfield (located on the southern side of the site). Further sporadic residential and farm buildings are present to the south of the site with further agricultural land and wooded areas beyond.
<b>To the west:</b>	Station Road is present along the north-western boundary with lakes beyond (a former extraction area) used for recreation and wildlife. Agricultural land forms the remainder of the western boundary.

## 2.2 Statutory and Non-Statutory Environmental Designations

As part of the Environment Agency's Pre-Application Service a screening report has been provided (on the 1<sup>st</sup> March 2022) centred on National Grid Reference (NGR) SU 57992 65659. The report details records they currently hold on nature and heritage conservation sites and/or protected species and habitats identified within the vicinity of the site (screening radius of up to 1 km), which must be considered as part of the Bespoke Permit Application.

The screening report (presented in **Appendix B**) identified the features listed, which have been considered in more detail within RSK's Environmental Risk Assessment (ERA) completed for this site.

### Nature and heritage conservation sites

#### *Sites of Special Scientific Interest (SSSI) within 1km of the sites centred NGR*

- Woolhampton Reed Beds - area of 5.77ha (centred at SU575667) 270 m north of site boundary/170m north of excavation area;
- Brimpton Pit - area of 1.65ha (centred at SU566651) 400 m west of site boundary/ 560m west of excavation area; and
- River Kennet - area of 112.72 ha (centred between SU203692 to SU572667) 450 m north of site boundary/ 430m northwest of excavation area.

In addition, the following SSSI's are located within a 2 km radius of the site (not considered by the EA screening report):

- Aldermaston Gravel Pits (1.2km northeast) – area of 23.41 ha, centred at SU596668 northeast; and
- Wasing Wood Ponds (1.2km south) – Area of 12.52 ha centred at SU578636, SU583633 south.

#### *Local Wildlife Sites (LWS) within 500 m of the sites centred NGR*

- Woodland near Woolhampton (5m north of excavation area).

### Protected Species (within 500 m of the sites centred NGR)

- European Eel migratory route;
- Atlantic Salmon migratory route;
- Bullhead;
- Brown Trout;
- Unidentified Lamprey;
- Brook Lamprey;
- Atlantic Salmon; and
- Fine-lined Pea Mussel.

### Protected Habitats (within 50 m of the sites centred NGR)

- Deciduous Woodland;

- Chalk Rivers;
- Coastal and Floodplains Grazing; and
- Marsh.

## 2.3 Site History

The site predominately comprises undeveloped agricultural land, wooded areas and wetlands. Brimpton Airfield located towards the south of the site area (comprising a 620 m grass runway and plane storage sheds) was developed in the 1950s and later extended with several storage sheds in the 2010s.

Towards the east of the site a weighbridge and temporary site office with surrounding compound was developed in 2015. There has been no other significant development of the site with exception to these features up to present day.

## 2.4 Proposed Mineral Extraction on Site

The site was awarded planning permission by West Berkshire Council for mineral processing in August 2013.

For manufacturing purposes Tarmac Trading Ltd has identified a need to secure on average 100,000 tonnes of minerals each year. Suitability for use will be dependant on the ability to process an appropriately large volume of excavated materials and blend with finer, washed sand.

Materials not required to be processed (or considered unsuitable), would be available to supply the local market, which is broadly considered to be of the same quantity (i.e. a further 100,000 tonnes). The output of the site is therefore required to meet c.200,000 tonnes annually.

A new proposed access route (onto the A340) from site has been incorporated into the design of the site to allow transportation of materials on and off site.

The site has been divided into three phase areas (designated 'A', 'B' and 'C') as detailed on **Figure 4**.

Groundwater beneath the site can be relatively shallow (within 1 meter of ground surface within Phase B and C) and therefore, to maximise the recovery of the sand and gravel and to facilitate the reclamation it is proposed to dewater the mineral working. It is intended to pump groundwater from sumps formed in the base of excavations into one of three settlement/balancing ponds on site before being discharged to nearby water courses.

The scheme treats each phase as a separate area of mineral extraction, linked by internal roads. There will be an initial transfer of overburden material between phases with extraction commencing in the southwest within Phase A1 and A2. Topsoil will be stored to the southeast of the phase.

Phases A3 and A4 would be worked in conjunction with Phase B during periods where dewatering discharge (from B) will be prohibited by high flow rates in the River Kennet and Enborne. Phase C would also be worked on a campaign basis. Extraction in Phase C4 (1-4) will be undertaken when dewatering is not possible in Phases C1-C3. Topsoil

storage mounds for Phases B and C will be located in the southeast of the site, outside of Flood Zones 2 and 3. These will also provide visual screening from Wasing Lane.

Design drawings detailing the proposed extraction and restoration operations across Phases A, B and C are presented in A1, B1 and C1 in **Appendix C**.

Timescales for each phase are estimated between 3 to 5 years, providing an overall working of these three phases as approximately 13 years, as shown on drawings 'PO1' and 'PO2' (in **Appendix C**), with a further 4 years to complete restoration by infilling.

## **3 GROUND CONDITIONS AND ENVIRONMENTAL RISK**

---

The ground conditions underlying the Site area have been established from both published geological map information and from the findings of extensive site investigations. Ordnance Survey Maps and site survey data indicate that site levels range from c.63 m AOD in the southwest, sloping gently down to c.55 m AOD in the northeast.

### **3.1 Geology**

#### **3.1.1 Solid Geology**

The solid geology for the region is detailed to comprise a series of sedimentary Cretaceous and Tertiary age strata with a southerly inclination. The oldest formation within the region is the Upper Chalk (Seafood Chalk Formation and Lews Nodular Chalk), which outcrops some 5 km to the north, east and west of the Site and thought to extend to some 90-130 m in depth. Beneath the site it is understood that the chalk is some 35 to 40 m down. The Upper Chalk is overlain by the Lambeth Group (estimated around 20 m in thickness) which sub-divides into the Upnor (oldest) Formation, Reading and Harwich (youngest) Formations. The London Clay Formation overlies the Lambeth Group and is exposed widely at lower elevations within the region and outcrops to the north and south of the site. The London Clay is estimated to be around 10 m in thickness beneath the Site.

#### **3.1.2 Superficial Deposits**

The site area is located on a River Terrace system of the Kennet Valley Formation. The south of the site area (including Phase A) is underlain by the Beenham Grange Gravel (Second Terrace deposits of the River Kennet), whilst Phases B and C (to the north of the site) predominantly comprise Alluvium, which in turn is underlain by the Beenham Grange Gravel.

Boreholes drilled within the site area for mineral evaluation indicate that the Beenham Grange Gravels (the target economic mineral) to comprise sand and gravel, observed as being more silty (initially) within the south with a higher percentage of sand. Alluvium (initially underlying Phases B and C) comprises clayey, silty sand and flinty gravels with occasional peat layers.

The central region of the site where the Beenham Grange Gravels and Alluvium meet is seen to be much more variable, often with clean gravel being less abundant as a result of the River Enborne.

The average thickness of the Beenham Grange Gravels across the three Phase areas varies between 2.75 m and 3.28 m. The deposits reach a thickness of almost 6.0 m in the centre and northern parts of Phase B. Evidence of a thick band of mineral running east from Phase A to Phase C and northwards towards the River Enbourne are believed to be paleochannels of the River Enbourne. A further channel (likely of the River Kennet) is believed to cross Phase B east to west. Localised deposits of up to 10 m thick have been recorded at Woolhampton Quarry to the west.

### **3.1.3 Overburden**

Overburden thickness and composition varies spatially across the site, averaging between 1.06 m and 2.08 m, with the greatest thickness (of up to 4 m) identified within the north of the site (to the north of Phase B and River Enborne) and comprising topsoil and silt with peaty layers. Towards the south of the site overburden comprises silty clays becoming more gravelly with depth and generally less than 2 m in thickness. The Beenham Grange Gravels are often present immediately below the soil layer within the south of the site.

### **3.1.4 Made Ground**

There is unlikely to be any made ground present within the areas proposed for excavation/restoration, however there may be a small amount of made ground within areas of the site associated with trackways, the airfield to the south of the site and compound (and weighbridge) to the east. Close to the site boundaries, localised areas of made ground may be associated with the farm buildings to the south and sewage works to the northeast.

## **3.2 Hydrogeology**

### **3.2.1 Groundwater Classification**

The site is underlain by a Secondary 'A' Aquifer (comprising both the Beenham Grange Gravels and Alluvium). The Lambeth Group and Upper Chalk are designated a Secondary 'A' aquifer and Principal aquifer respectively and are likely to be in hydraulic continuity.

The solid geology of the London Clay Formation is considered unproductive with the London Clay acting as an aquitard between the superficial deposits and solid formations. The two aquifers are considered to be hydraulically separated. Beneath the site area the London Clay Formation is understood to be circa 10m thick.

### **3.2.2 Groundwater Abstractions**

EA information (dated January 2022) provided for Envireau Water's HIA report indicates that there are five active (at the time of the report) licensed groundwater abstractions within a 2 km radius of the site. The three nearest abstractions are circa 0.5 km from the site. Two are owned by the Environment Agency for non-remedial river/ wetland support to the north-west and south-west of the site, the other is owned by the client Tarmac for mineral washing at Woolhampton Quarry to the west of the site. The remaining two abstractions are for various domestic purposes.

### **3.2.3 Source Protection Zones**

The site falls entirely within the Total Catchment (Zone 3) of an EA Source Protection Zone (SPZ) for several abstractions to the north, east and west of the site. The nearest SPZ Zone 1 located 1.8 km northeast of the site is associated with an abstraction license held by Padworth Fish Farm.

### **3.2.4 Private water supplies**

Information provided by West Berkshire Council for Envireauwater's HIA report details that there are 10No private water supplies within a 2 km radius of the site (from both surface and groundwater supplies). The nearest to the site (located within 500 m) are located at Wasing Lodge (water well) 280 m south and Pyford Marina 500 m northeast..

### **3.2.5 Groundwater Levels**

Groundwater levels are monitored on a monthly basis by Tarmac in 22No boreholes screened across the sand and gravel deposits that are installed at and around the Site (including the former Woolhampton Quarry situated to the west). Groundwater levels in the area range from 52.1 – 62.8 m AOD.

Monitoring wells in close proximity to watercourses showed fluctuations of typically 1.0 m than those further from watercourses, which showed seasonal fluctuations of up to 2.0 m. Evidence of the monitoring and rainfall trends infers that there is a hydraulic connection between groundwater in the sand and gravel aquifer and the local watercourses.

The groundwater flow direction is inferred to be northward and north-eastward, towards the Rivers Kennet and Spring Ditch. Groundwater also discharges to the River Enborne, and locally to the smaller surface water features.

## **3.3 Hydrology**

### **3.3.1 Watercourses**

The River Enborne, present on the sites southwestern boarder, flows in a north-eastwards direction across the centre of the site area towards its confluence with the River Kennet (some 600 m downstream of the site boundary). There are several tributaries of the River Enborne that flow through the Site. The largest of these originate on land to the south and flow northwards east of excavation Phase A and along the south-eastern Site boundary. These are referred to as Stream A and Stream B, respectively.

The mean flow of the River Enborne at Brimpton flow gauging station (some 600 m upstream and southwest of the site boundary) is 1.33 m<sup>3</sup>/s.

The River Kennet flow eastwards some 100 m from the site boundary at its closest point and connects with the Kennet & Avon Canal at several reaches north of the site and downstream effectively forming the same watercourse (commencing from Woolhampton Lock 500 m northeast). Approximately 400 m north-east of the Site, the Canal and River Kennet spilt again with the canal branching off to the northeast and river branching off more towards the southeast.

To the north, around Woolhampton, several tributaries flow southwards to join the River Kennet/Kennet & Avon Canal.

Information within Envireau Water's HIA report details that the reach of the Kennet & Avon Canal between Woolhampton Lock and the weir downstream of the site is at an approximate constant elevation of c.55.9 m AOD and consequently has almost no flow within this reach.

### **3.3.2 Waterbodies, canals and drainage**

There are a number of waterbodies local to the site associated with the former sand and gravel extraction within the area. Towards the north and west, there are six waterbodies located within the former quarry workings of Woolhampton, the closest being c.200 m from the site boundary. Further waterbodies associated with sand and gravel workings are present within the vicinity of the site (c.1 km) to northeast and north of the Kennet & Avon Canal and (c.1.6 km) to the northeast near Aldermaston Wharf.

The drainage system to the north of the site between Phase B, C and the River Kennet were created in the 1950/60s as an overflow catchment to the river. The main drainage feature in this area is Spring Ditch, this flows westwards from the former Wollhampton Quarry and heads across the north of Phase B to its confluence with the River Enborne, 310 m east of the Site. There are several small watercourses in the woodland north of the Site. Some of these have been developed to direct any overflowing water from the River Kennet/Kennet & Avon Canal to Spring Ditch.

### **3.3.3 Surface water abstractions**

Current licensed surface water abstractions present within a 2 km radius of the site include one license for spray irrigation for the Wasing Farm Partnership approximately 1.2 km south of the site designated the Lake at Wasing (Point A).

### **3.3.4 Flood Risk**

Approximately 50% (calculated as c.48 ha) of the site area falls within an EA designated Flood Zone 3 which has an annual probability of fluvial flooding greater than 1 in 100 (>1%) in any given year. The majority of Flood Zone 3 is a functional floodplain for the River Enborne and modelling suggest that it floods more frequently.

A further 27% (calculated as c.19 ha) of the site falls within Flood Zone 2 which has an annual probability of fluvial flooding between 1 in 100 (1%) and 1 in 1000 (0.1%) in any given year.

The remaining 23% of the site (calculated as 16 ha) falls within Flood Zone 1 which has an annual probability of fluvial flooding of less than 1 in 1000 (0.1%).

## **3.4 Environmental Risk Assessment**

An Environmental Risk Assessment (ERA) has been carried out by RSK Ltd. A copy of the Assessment complete with overview of potential risks to Human Health the Environment is included as **Appendix D**.

The ERA has been conducted in accordance with the Environment Agency guidance published online. It considers the potential impact of the restoration works in respect of possible contamination, noise, dust, vibration and any other potential risks to the environment.

It gives due regard to the site operating period whilst looking at the potential risks and source(s) of the risks, derived from associated activities, potential receptors and risks to those receptors and potential screened out risks including control measures.

A summary table within **Section 7** of the ERA report details potential risk that may impact the 'Receptors' identified at the site from the restoration activities and management strategies in place (or to be adopted) to ensure that 'Overall Risk' to these receptors remains 'Low'.

Receptors at and in the vicinity of the site are considered to comprise:

**Local Human Population:**

- People and property (adjacent and nearby residents from as close as 25 m south, Aldermaston Primary School is 220 m southeast of the southern boundary);
- Recreation site and rights of way (recreation ground 370 m to the southeast and a public footpath crossing the site); and
- Air Quality (site is not located within an air quality management area for pollutants).

**Local Environmental Receptors:**

- Sites of Statutory and Non-Statutory Environmental Designation;
  - Protected Habitats (woodland, chalk rivers, coastal and floodplain grazing, marsh. Within 50 m);
  - Protected Species (Fish and Mollusca species. Within 500 m);
  - Local wildlife sites and SSSIs (Woolhampton Woodlands and Reed Beds 270 m north, Brimpton Pit 400 m west and River Kennet 450 m north); and
- Animals (grazing horses present 100 m northwest of the northern boundary). Other potential wildlife (e.g. water voles, badgers, dormouse).

**Groundwater**

- Shallow Secondary 'A' Aquifer (groundwater within the Alluvium and Beenham Grange Gravels) between <0.1 m and 4.5 m bgl, but locally at ground level or even recorded as flooded;
- Off-site groundwater abstractions <0.5 km west (northwest and southwest) and private water supplies (500m northeast).

**Surface water**

- River Enborne on site (plus local drainage network north);
- Off-site surface water abstractions (1.2 km South for Spray Irrigation); and
- River Kennet (100 m north off-site).
- Drainage network on site (tributaries of the River Enbourne – Stream A flowing to the north, east of Phase A and Stream B flowing to the northeast, along the sites south-eastern boundary)

The ERA has considered emissions to air, land and water, odour, noise, dust, litter, and potential for accidents and incidents and any other potential risk to the environment.

The assessment concludes that with the implementation of the risk management measures; potential hazards from the proposed works are not likely to be significant and no further assessment is required.

## 4 WASTE RECOVERY PROPOSAL

---

### 4.1 Proposed recovery scheme

As discussed in **Section 2.4**, the scheme involves the phased extraction of sand and gravel with progressive restoration of the site, largely back to agriculture (with several minor waterbodies), using imported suitable inert materials and site derived overburden and soils.

The restoration policy for the Kennet Valley is to avoid creating further large water bodies following extraction (as seen with former mineral workings to the west of the site). Therefore, the design of the scheme is to restore the majority of the area back to agricultural land at broadly (or marginally below) original site level.

The exception is to leave three small settlement lagoons in-situ, as identified on **Appendix E** (used for quarry discharge water to settle out suspended soils).

After excavation works on site have ceased it is proposed to retain these features as waterbodies which will undergo further enhancement through shaping the margins and peripheral planting.

In addition, a fourth waterbody (a fishing lake) will be developed along the sites northern boundary to aid surface water management of the site and not increase the risk of flooding off-site.

Details provided to both the EA and the councils Sustainable Drainage Officer satisfy concerns that the proposals will not generate an unacceptable level of impact to the sites environment or increase the risk of flooding, Furthermore the proposals will provide an additional 15,000 m<sup>3</sup> of flood storage capacity through the lowering of land across large areas of the site upon completion of restoration.

As detailed in the planning conditions a surface water drainage scheme must be submitted to and approved in writing by the local planning authority for the phase of the site as it is restored, based on sustainable drainage principles and an assessment of the hydrological and hydro geological context of the development.

#### 4.1.1 Backfilling and material overview

Based on volumetric calculations, it is considered that the annual amount of sand and gravel mineral removed from across the three Phase areas to meet production requirements will be c.125,000 cubic meters. It is anticipated that approximately 10% of the material processed annually will comprise silt (as detailed in **Table 2**).

To return the site to near original level it is proposed to import acceptable, strictly inert material, arising locally (including clay, sandy clays and similar) that are unsuitable for extraction as part of the mineral working. The base of the extraction void will be lined with a low permeability clay type material to form a protective barrier.

It is considered (for volumetric purposes) that a total import of 1,153,000 m<sup>3</sup> of material will be required to complete the restoration requirements for the site.

To balance material output from the site it is considered that 112,400 cubic meters of material is to be imported annually.

Silt recovered from processing of the excavated sand and gravels may be use on site in the restoration process, reducing the volume of imported materials. It is considered that roughly 10% of the material processed annually will comprise silt (which has been calculated at c.12,400 cubic meters).

Experience from other mineral exploration sites (including Midgham, Beenham) has shown that more realistic import volumes achievable are around **90,000 cubic meters annually**. This figure has been adopted to provide realistic timescales for reclamation at the site.

The site has been intensively investigated to determine mineral yields from each of the Phase areas. These are determined in **Table 3** below along with anticipated restoration requirements to achieve the proposed landform.

**Table 2 : Phase area mineral yields and import requirements**

Phase	Sand and Gravel (cu.m)	Silt (cu.m)	Total Import requirement (cu.m)
<b>A</b>	563,200	68,300	494,900
<b>B</b>	412,300	50,500	361,800
<b>C</b>	338,500	42,300	296,200
Total	1,342,600	161,100	1,153,000

Programming of the phases will allow overburden from certain phases to be used as part of the reclamation materials for other phases. At the moment it is anticipated that:

- overburden from the first stage of Phase B will be used in reclaiming Phase A,
- overburden from the first stage of Phase C will be used in reclaiming Phase B.

Reclamation is anticipated approximately 12 months after commencement of extraction (once a mineral void has been created) and therefore (allowing for one year of no tipping) the following estimate of each phase working, reclamation and completion is detailed in **Table 3** below.

**Table 3: Approximate time period for each working Phase**

Phase	Mineral Extraction	Reclamation	Completion
<b>A</b>	3.25 years	3.5 years	By year 5
<b>B</b>	5 years	6.25 years	By year 11
<b>C</b>	4 years	5 years	By year 15
Total	12.25 years	14.5 years	

Planning conditions require that extraction of minerals shall cease no later than the 13 years from the date upon which operations commenced and that the deposit of reclamation materials shall cease no later than 15 years upon which operations commenced.

Based on the adopted infill rate of 90,000 cubic meters being achievable to restore the site annually, over a tipping period of 14 years (allowing an additional year of no filling) a potential fill volume would equate to 1,260,000 cubic meters.

However, recent 3D modelling and volumetric assessment estimates the available void as 1,314,100 cubic meters.

As calculated in **Table 2**, it is anticipated that 161,100 cubic meters of mineral excavated from the site will be derived from silt separated during processing activities which could be used alongside imported inert materials as fill to meet the required quantity modelled.

The average fill rate to achieve the 14-year planning deadline (including a year of no filling) will be **82,357 cubic meters annually** (approximately 148kt per year) to meet the total import calculated as **1,153,000 cubic meters** (approximately 2.1Mt at 1.8t/ cubic meter) to complete the scheme and return the site to near original levels.

The materials required to raise site levels will comprise the importation of locally sourced materials of an 'Inert' waste classification. As a sustainable approach, this is considered to significantly reduce the need to import virgin materials to the site to complete the approved scheme.

There is likely to be some short-term on-site storage of materials prior to deposition within the voids.

## **4.2 Substitution of non-wastes with wastes to produce the same outcome.**

### **4.2.1 Introduction**

The restoration of the site is considered to be a waste recovery activity rather than a waste disposal activity as the primary reason for the work is to achieve a clear benefit which Tarmac has an obligation to undertake.

### **4.2.2 Obligation**

The Section 106 agreement places a statutory planning obligation on Tarmac to complete the scheme in accordance with the approved planning consent and restoration scheme. A copy of the Planning Decision Notice and Section 106 agreement is presented in **Appendix F**.

This means that Tarmac would have to do the work to get the same outcome using non-waste materials, if waste materials could not be employed.

This section provides a summary of the requirements defined by the Section 106 agreement and planning consent. The parties named on the Section 106 agreement include:

- West Berkshire District Council: The local planning authority ("the Council");
- Sir William Stratford Dugdale and Lady Cecilia Mary Dugdale, William Matthew Stratford Dugdale and Hugh Adrian Bethell): The trustees of the Wasing 1985 Settlement ("the Owner"); and

- Lafarge Aggregates Ltd (Tarmac): The 'Operator' who will undertake the restoration of the Site and will hold the Environmental Permit ("the Developer").

The Section 106 agreement defines several terms and meanings which include the following:

- The "Application" with reference to planning permission dated 18<sup>th</sup> May 2012 submitted to the council for the 'Development' and allocated reference 12/01220/MINMAJ; and
- the "Development" as meaning progressing mineral extraction with restoration using imported inert material to agriculture, lakes and grassland, the construction of new access onto the A340 together with ancillary buildings (site office/messroom, weighbridge, security compound etc) and internal roads (including improvements to existing bridge across the River Enborne) pursuant to the Planning Permission.

The parties named on the Section 106 agreement acknowledge that the planning obligations contained in the agreement and conditions pertaining to the site by the council are necessary to make the development acceptable in planning terms and directly related to the development.

In summary, the Schedule 106 agreement and associated covenant included in the schedule (notably Items 4 and 5) require the development (including scheme for monitoring the condition of the A340 either side of the new access route and conservation improvements as details in the Conservation Management Plan – 702/W/CM/1) for the site to be undertaken.

In addition, approval for the scheme was granted by West Berkshire County Council in August 2013, subject to a number of conditions detailed in **Section 1.2** of this report, of which several relate to restoration of the site including timescale upon which reclamation must commence and cease, classification of waste accepted for as fill, submission and approval by the council of a reclamation and monitoring scheme, phased restoration scheme and landscaping plan, landscaping and ecological management plan and a topsoil and subsoil placement scheme.

Based on the requirements of the Environment Agency (2016) it is therefore considered that, under the Section 106 agreement and planning conditions, Tarmac has a statutory obligation to carry out the work at the site.

### 4.3 Benefit of the scheme

In order to meet supplier demand there is need for sand and gravel by the local construction market. The sand and gravel deposits in the Kennet Valley have long been identified as the main resource from which a steady supply can be obtained. The site identified at Lower Farm in Wasing represents the best available remaining reserve to be developed.

To ensure that the development has the least impacts locally and reflects a sustainable approach, the site will be developed by Tarmac as the only mineral working in this part of the valley for use within the local market.

The design of the working and restoration of the site has been prepared jointly with the Wasing Estate who are the landowners and are therefore concerned to achieve the best

balance in restored land use that enables successful stewardship of the site into the future, long after working and restoration have finished.

The development is on a phased basis, with each phase being worked and restored on a progressive basis. The design includes:

- Early planting to assist in screening any visual impacts;
- A new purpose designed access onto the A340;
- Reclamation by infilling with inert materials to achieve high quality restoration to agriculture;
- Creation of four waterbodies to improve biodiversity locally; and
- Increase the capacity of the area (by 15,000 m<sup>3</sup>) to accommodate flood water storage.

The restoration design is to return the majority of the area back to its existing level and use to reflect the guidance in the Kennet Valley Landscape and Restoration Strategy and planning condition obligations made on approval of the development scheme.

Utilising silt material available after processing the sand and gravel extracted from the site (where possible) demonstrates a clear environmental benefit in relation to the waste hierarchy, with recovery taking precedence over disposal.

It is anticipated that that a total import of 1,153,000 cu.m of material will be required to complete the restoration requirements with an additional 161,100 cu.m of site derived silt also used as a waste product from processing the mineral, thereby further reducing waste materials unnecessarily to landfill

The importation of locally source waste, natural soils and inert made ground will reduce the unnecessary transportation and use of virgin materials/aggregates from further afield, with the associated environmental disbenefits.

#### **4.4 Minimum volume of waste being used**

The estimated quantity of materials required represents the minimum amount necessary to achieve the proposed restoration of the site in accordance with the Statutory Obligation set by the approved planning and Section 106 agreement.

The design seeks to ensure the volume of imported material is kept to the minimum needed to achieve the benefits for restoring the site. Volumetric calculations for the scheme are presented in **Appendix E**.

As discussed in **Section 4.1** and **4.3** above, the estimated volume of imported materials required to meet the approved restoration scheme is approximately 1,153,000 cubic meters.

Based on an approximate density of 1.8 tonnes per m<sup>3</sup>, the anticipated tonnage of imported restoration material is approximately 2,075,400 tonnes, with an average fill rate of **82,357 cubic meters annually** (approximately 148kt per year).

Complete details on the restoration of the site is provided on the restoration plan (presented in **Appendix E**). Restoration of each 'Phase' (A, B and C) is shown on drawings PO1 and PO2 within **Appendix C**.

Several lines of evidence should be considered which demonstrate that only the minimum amount of waste necessary is being used:

- Silt materials will be recirculated for use at the site following processing of the excavated sands and gravels and incorporated into the final restoration material requirements;
- Planning conditions stipulate that the site levels are to remain largely the same (and not above existing site levels), with the addition of a several small waterbodies (three of which will be retained settlement ponds from the extraction works). Therefore, no area will be raised above the existing site levels on completion of excavation and restoration;
- Furthermore, if less material was used then the required site levels would not be achieved, and local depressions may arise. Given groundwater is shallow beneath the site area, further waterbodies would be created on site (in addition to those approved) which would go against the requirement of the Kennet Valley Landscape and Restoration Strategy; and
- In addition, the design highlights that the use of less imported waste or non-waste materials to the site to complete the scheme would cause a significant impact on the surface and water management design.

No more than the permitted amount of waste specified by this Waste Recovery Plan will be utilised. The proposals will only incorporate the approved design aspects, so no additional imported materials would be required to complete the scheme.

## 4.5 Waste suitability

Wastes to be used in the restoration of the site will be consistent with those acceptable for recovery schemes of this type. As an indicative list, it is proposed that the wastes listed in the **Table 4** below can be accepted as inert without testing provided that are from a single source and there is no reason to suspect they are contaminated.

**Table 4: Site setting**

EWC Code	Description	Restrictions
01	WASTE RESULTING FROM EXPLORATION, MINING, QUARRYING AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS	
01 01	Wastes from mineral excavation	-
01 01 02	Wastes from mineral non-metalliferous excavation	Restricted to waste overburden and interburden only
01 04	Wastes from physical and chemical processing of non-metalliferous minerals	-
01 04 08	Waste gravel and crushed rocks other than those mentioned in 01 04 07	-
01 04 09	Waste sand and clays	-
10	WASTE FROM THERMAL PROCESSES	

EWG Code	Description	Restrictions
10 12	Waste from manufacture of ceramic goods, bricks, tiles and construction products	-
10 12 08	Waste ceramics, bricks, tiles and construction products (after thermal processing)	-
<b>17</b>	<b>CONSTRUCTION AND DEMOLITION WASTES</b>	
17 01 01	Concrete	Selected C&D waste only <sup>2</sup>
17 01 02	Bricks	Selected C&D waste only <sup>2</sup>
17 01 03	Tiles and ceramics	Selected C&D waste only <sup>2</sup>
17 01 07	Mixtures of concrete, brick, tiles and ceramics other than those mention in 17 01 06	Selected C&D waste only <sup>2</sup>
17 05 04	Soil and stones <sup>1</sup>	Excluding topsoil, peat; and soil and stone from contaminated sites
<b>19</b>	<b>WASTE FROM WASTE MANAGEMENT FACILITIES</b>	
19 12 09	Minerals (for example sand, stones) only	-
<b>20</b>	<b>MUNICIPAL WASTE (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL AND INDUSTRIAL AND INSTITUTIONAL WASTE)</b>	
20 02 02	Soil and stones <sup>1</sup>	From garden and parks waste; excluding topsoil and peat
<sup>1</sup> For the purposes of waste acceptance, soil includes naturally occurring sands and clays. <sup>2</sup> Selected construction and demolition (C&D) waste: with low contents of other types of materials (like metals, plastics, organics, wood, rubber, etc). The origin of the waste must be known. <ul style="list-style-type: none"> <li>• No C&amp;D waste from buildings, polluted with inorganic dangerous substances, e.g. Because of production processes in the construction, soil pollution, storage and usage of pesticides or other dangerous substances, etc unless it is made clear that the demolished building was not significantly polluted; and</li> <li>• No C&amp;D waste from buildings treated, covered or painted with materials containing dangerous substances in significant amounts.</li> </ul>		

Subject to the application of suitable waste acceptance procedures at the site during restoration, these waste types will not pose an unacceptable risk to environmental or human health receptors (as discussed in **Section 3.4**). The proposed imported waste materials would be subject to chemical testing for a range of solid and leachate parameter to meet an Inert WAC classification.

The incoming materials will be predominately clean excavation soils, sourced from mid to large scale local construction projects. Silt material as a result of processing the sand and gravel extracted from the site will also be returned forming part of the total import requirement.

Planning conditions stipulate that no rocks/large stones or other material exceeding 150 mm in any dimension or other deleterious material likely to cause physical obstruction to cultivation and maintenance of the surface to be restored, are placed within one metre of the surface of the deposited reclamation material.

Full details of waste acceptance procedures and operator competence will be provided as part of the Environmental Permit Application submission.

## 4.6 Standard of completion

The purpose of the work has already been clearly defined in preceding sections of this WRP. Environment Agency (2016) requires that a WRP must provide evidence to show how the work will be:

- Designed and constructed; and
- Fit for purpose.

It is considered that evidence of design, construction and that the scheme is fit for purpose has been demonstrated through the planning process (and associated design drawings) and as such the proposed development has been granted consent.

Environment Agency (2016) also requires that the WRP demonstrates that the finished scheme must not result in any environmental problems such as:

- Soil erosion;
- Pollution; and
- Increased risk of flooding in the surrounding area.

The restoration of the site will require significant financial commitment to gain regulatory approval for the scheme and undertake the sequence of works described. It is in the interest of Tarmac to complete the scheme to a high standard.

Planning conditions require that the scheme will be completed to a engineered standard appropriate to the final use.

Testing may be necessary to confirm that the required standard (and placement of materials) has been met in line with the Specification for Highways Works.

Chemical verification of imported soils will be undertaken to ensure soil concentrations meet the requirement of an Inert Waste Assessment Criteria (WAC). Documentation should also be provided to include the name and origin of the supplier of imported materials.

All imported materials will be of suitable properties for the scheme and be appropriately placed to ensure the site meets the standards required by the Kennet Valley Landscape and Restoration Strategy. All works will also be conducted in accordance with prevailing Environment Agency guidance as well as relevant industry guidance, including but not limited to DEFRA (2009).

As identified in **Section 4.1**, a SUDs design scheme has been produced as part of a detailed Flood Risk Assessment to support planning, which will specifically include measure to ensure that the restored site does not increase local flood risk. The SUDs scheme itself is likely to also derive environmental benefits.

The proposed recovery activity will be regulated by the Environment Agency under an Environmental Permit. Relevant staff within Tarmac who will be managing the restoration of the site have been assessed to be technically competent for inert waste management operations under the WAMITAB/CIWM Operator Competency Scheme. Copies of

technical competence and training certificates for relevant Tarmac staff will be provided as part of the Environmental Permit application.

Tarmac operates a comprehensive quality and environmental management system that meets the requirements of ISO 14001. Full details of Tarmac's Environmental Management System will be provided as part of the Environmental Permit application. It is therefore considered that Tarmac has an effective management system in place that ensures a high level of environmental protection.

A programme of groundwater monitoring is ongoing within existing monitoring wells on site before, during and after the site redevelopment to identify any potential presence of contaminant concentrations. Existing monitoring data will be assessed and a baseline for future groundwater quality assessment will be derived.

Should any failures of either chemical or geotechnical test results be identified, an appropriate course of action will be agreed with the EA, which may include excavation and off-site disposal of any failing materials.

The verification testing results will be used for eventual surrender of the Environmental Permit.

It should be noted that Environmental Permitting Regulation state that a Site Condition Plan (SCP) is not applicable to those part of a permitted activity that have permanent deposits of waste and therefore will only cover areas of the permitted site where waste has not been deposited (for instance, access routes, site office/compound, storage areas).

In conclusion it is clear that the scheme must be completed to an engineered standard appropriate to the final land use in order to comply with the planning conditions for the development.

## **4.7 Other benefits**

Details within the planning approval letter discuss the reasons for the Local Authority's decision to grant permission for the scheme including the number of benefits they foresee in the long-term including enhancements of Public Rights of Way Network, improvements to the landscape character of the area, increasing in flood water storage capacity, ecological and biodiversity enhancements.

## 5 SUMMARY

---

It has been identified that to maintain an adequate and steady supply of minerals to meet the need of the growing market and production output; that an immediate new reserve of sand and gravel is required in West Berkshire.

The sand and gravel deposits in the Kennet Valley have long been a viable resource from which a steady source of material has been obtained. From a view of several sites, it is considered that the Wasing Quarry site at Lower Farm on Wasing Lane represent the best available remaining reserve to be developed, ensuring the least impacts on the local area and reflects a sustainable approach to future mineral resourcing.

The design of the workings and restoration of the site have been prepared jointly with the Wasing Estate (landowners) with a focus on achieving the best balance in restored land uses long after restoration has finished and achieving enhancements in the sites ecological and biodiversity. Additional benefits also include enhancements of Public Rights of Way, improvements to the landscape character of the area, the addition of water bodies across the site area and increasing flood water storage capacity.

The site has a complex environmental setting with several Site of Specific Scientific Interest (SSSI) nearby. In addition, the site is recognised as having local wildlife and classified under protected habitats and species. A shallow Secondary 'A' aquifer underlies the site with deeper groundwater resources classified as a Principle Aquifer (although these are considered to be hydraulically separated). A degree of hydraulic connection exists between shallow groundwater and local watercourses to the north and west with groundwater flow inferred to the northeast, towards the Rivers Kennet and Enborne.

Comprehensive studies have been completed to establish baseline information and identify any potential environmental impacts and inform appropriate mitigation measures. The conclusions of the assessments completed to date and ERA show that the scheme (including approved restoration of the site) will not give rise to any unacceptable impacts to the sites environment and will provide a sustainable environmentally beneficial approach by recovering wastes, avoiding landfill disposal, and reducing the use of virgin material.

Soil imports and processed materials from onsite treatment will be deemed suitable for use subject to specific site acceptance criteria.

Groundwater monitoring will be carried out to ensure there is no deterioration of the current groundwater quality resulting from the proposed works.

In conclusion, it is considered that the scheme demonstrates waste recovery as defined in the Environment Agency waste recovery plans and permit guidance (<https://www.gov.uk/guidance/waste-recovery-plans-and-permits> 2017)

## **FIGURES**

---

# APPENDICES

---

# APPENDIX A

## RSK SERVICE CONSTRAINTS

---

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Tarmac Trading Ltd (the "Client") in accordance with the terms of a contract [RSK Environment Standard Terms and Conditions] between RSK and the Client. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by an environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.
2. Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the Client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials, unless specifically identified in the Services.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services or accreditation system (such as UKAS ISO 17020:2012 clause 7.1.6):
  - a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.
  - b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.
  - c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the Client and RSK.

8. The intrusive environmental site investigation aspects of the Services are a limited sampling of the site at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope between the client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species are not present.

9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.
10. The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.
11. Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works.
12. Unless stated otherwise, only preliminary geotechnical recommendations are presented in this report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed



# APPENDIX B

## EA SCREENING REPORT

---



# APPENDIX C

## DESIGN DRAWINGS

---



# APPENDIX D

## RSK ENVIRONMENTAL RISK ASSESSMENT

---



# APPENDIX E RESTORATION PLAN AND LANDFILL VOLUMETRICS

---



# **APPENDIX F PLANNING DESIGN NOTICE AND SECTION 106 AGREEMENT**

---