

# Brookhurst Wood - Open Windrow Compost Facility

Environmental Permit Variation EPR/AB3700LS/V006  
Updated Site Condition Report for ATRF and OWC

Biffa Waste Services Ltd

Project reference: EPR/AB3700LS/V006  
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<b>Prepared by</b>	<b>Checked by</b>	<b>Verified by</b>	<b>Approved by</b>
Diane Jeffery Senior Engineer	Caroline Braithwaite Principal Consultant	Angela Graham Associate	Angela Graham Project Manager

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	1	Neil Sumner / Biffa Waste Services Limited

## Prepared for:

Biffa Waste Services Ltd

## Prepared by:

Diane Jeffery  
Senior Engineer  
M: 07786 395693  
E: [diane.jeffery@aecom.com](mailto:diane.jeffery@aecom.com)

AECOM Limited  
6th Floor, 2 Charlotte Place  
Southampton SO14 0TB  
United Kingdom

T: +44 23 810 2180  
[aecom.com](http://aecom.com)

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## Table of Contents

1.	Report Context.....	6
1.1	Introduction.....	6
1.2	Proposed Facility.....	6
2.	Site Details .....	7
2.1	Applicant.....	7
2.2	The Site.....	7
2.3	Application Document References .....	7
2.4	Site Description and Layout .....	7
2.4.1	Site Location.....	7
2.4.2	ATRF Location .....	8
2.4.3	OWC Location.....	8
2.4.4	Surrounding Area .....	9
3.	Condition of Land at Permit Issue .....	10
3.1	Environmental Consents, Permits and Designations.....	10
3.2	Environmental Setting .....	11
3.2.1	Geology .....	11
3.2.2	Hydrogeology.....	11
3.2.3	Surface Waters .....	12
3.3	Pollution History .....	12
3.3.1	Pollution incidents which may have affected the land.....	12
3.3.2	Historical Land Uses and possible associated contaminants.....	13
3.3.3	Visual and Olfactory evidence of existing and historic contamination.....	14
3.3.4	Other Potentially Contaminative Industries .....	14
3.3.5	Evidence of damage to pollution prevention measures.....	14
3.3.6	Baseline Data.....	15
4.	Permitted Activities.....	16
4.1	Site Permitted Activities .....	16
4.1.1	Existing Wider Site Activities.....	16
4.1.2	Existing ATRF Activities .....	16
4.1.3	Proposed New Treatment Operations.....	16
4.1.3.1	OWC Facility.....	16
4.1.3.2	New ATRF Crushing Operations .....	17
4.2	Non-Permitted Activities.....	18
4.3	Environmental Risk Assessment .....	18
4.3.1	Methodology .....	18
4.3.2	Potential Sources of Contamination .....	18
4.3.3	Potential Receptors .....	18
4.3.4	Potential Pathways.....	19
4.3.5	Qualitative Risk Assessment.....	19
4.3.6	Conclusion.....	22
4.4	Operational Environmental Risk Assessment.....	22
	Appendix A Envirocheck Report.....	23
	Appendix B MAGIC Screen.....	24
	Appendix C Capita Symonds 2010 Report .....	25
	Appendix D Swan Environmental 2023 Report.....	26
	Appendix E List of Receptors .....	27
	Appendix F Conservation Screen from EA.....	29

## Figures

Figure 1. Site Location Plan .....	8
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## Tables

Table 1 Site Details .....	7
Table 2. Historical Land use .....	13
Table 3. Waste Management Operations at the ATRF.....	16
Table 4. Waste Operations at the OWC.....	17
Table 5. Waste Operations associated with the crusher. ....	17
Table 6 Potential Sources of Contamination.....	18
Table 7. Potential Receptors.....	19
Table 8. Potential Pathways .....	19
Table 9. Qualitative Risk Assessment .....	20

# 1. Report Context

## 1.1 Introduction

AECOM has been commissioned by Biffa Waste Services Limited (“the Operator” or Biffa) to prepare an application to develop a new Open Windrow Composting Facility (OWC) at Brookhurst Wood, Warnham, West Sussex. Given the locality of the new development on site, the new OWC will be added as an additional operation to the environmental permit (EPR/AB3700LS) for the Aggregate Treatment and Recycling Facility.

The new OWC facility is being developed to treat up to 60,000 tonnes per annum (tpa) of green waste and 30,000 tonnes per annum of wood waste.

This document is the updated ATRF Site Condition Report which has been prepared to support the permit application. The report details the history and current state of the site and surrounding land and should be read in conjunction with other supporting application information.

## 1.2 Proposed Facility

There are no changes proposed to the existing Aggregate Treatment and Recycling Facility (ATRF) operations although a new crushing operation will be included, and some additional waste codes will be added to the permitted waste list, including mixtures of waste from the mechanical treatment of wastes that contain a high proportion of recoverable aggregate.

The proposed OWC facility will comprise new plant to facilitate the receipt, shredding and subsequent composting of green waste and the shredding of wood waste. Waste types accepted at the facility will be defined according to their List of Waste (LoW) Code and will generally consist of:

- wood waste;
- green waste;
- leaves;
- grass clippings; and
- horticulture type waste.

The facility will not receive or accept any waste covered by the Animal By-Product (Enforcement) (England) Regulations 2013 (ABPR).

The new plant will be designed to effectively shred the constituent parts of the incoming green waste, which is then transferred to open air windrows for composting and maturation. Green waste will be treated through the composting process while wood waste will only be shredded.

The intention is to produce a PAS 100 compliant product and as such it will be deemed to have reached end of waste criteria and has achieved product status. The product can be utilised for a wide range of beneficial after-uses including landfill restoration, community projects within West Sussex, use in domestic gardens and for agriculture.

## 2. Site Details

### 2.1 Applicant

Biffa Waste Services Limited  
Coronation Road  
Cressex  
High Wycombe  
Bucks  
HP12 3TZ

Registered company number: 946107

### 2.2 The Site

The details of the site are summarised in Table 1 below:

**Table 1 Site Details**

	Site Details			
<b>Activity Address</b>	Brookhurst Wood Waste Treatment and Recycling Facility Langhurstwood Road Horsham West Sussex RH12 4QD			
<b>National Grid Reference</b>	TQ 17099 34700			
	Easting	517099	Northing	134700

### 2.3 Application Document References

<b>Document Reference and Dates for SCR at Permit Application</b>	<ul style="list-style-type: none"> <li>• Envirocheck Report (Appendix A).</li> <li>• MAGIC Search Results (Appendix B).</li> <li>• Capital Symonds Geo-environmental Report, June 2010. (Appendix C).</li> <li>• Swan Environmental Generic Quantitative Risk Assessment Report, July 2023. (Appendix D)</li> </ul>
<b>Document References for Site Plans</b>	<p>Drawings in Application Section 10.0 Drawings and Plans</p> <ul style="list-style-type: none"> <li>• BA235900 Proposed Site Plan</li> <li>• BA0313400 OWC Drainage Plan</li> <li>• BA234501 ATRF Drainage Plan</li> <li>• BA236000 Receptor Layout</li> </ul>

### 2.4 Site Description and Layout

#### 2.4.1 Site Location

The site is located approximately 4 kilometres to the north of Horsham. The village of Warnham is 1.5 km to the southwest and Kingsfold is 2km to the north. The centre of the site is located at National Grid Reference (NGR) E517099, N134700 at Brookhurst Wood, Langhurstwood, Horsham, West Sussex.



**Figure 1. Site Location Plan**



### 2.4.2 ATRF Location

The existing ATRF treatment area occupies an area of approximately 0.6865 ha which is situated to the south / southwest of the current Brookhurst Wood landfill site. The existing access road occupies an area of approximately 0.27 ha. The plant is situated on existing hardstanding and will be situated to the north and west of the new OWC facility.

### 2.4.3 OWC Location

The OWC application area will be located adjacent to the southern and eastern installation boundary of the existing ATRF plant and to the south of the Brookhurst Wood Landfill Site.

The OWC process will be developed on existing vacant land adjacent to the east and south of the ATRF. The OWC treatment area extends to approximately 2.84ha.

A new impermeable concrete platform will be constructed for the OWC operations and will incorporate new access road along the southern boundary of the OWC site, to the west is a storage and treatment area including a screening /separation treatment building and the windrow treatment area will be situated along the eastern side of the site. A new weighbridge area incorporating incoming/outgoing weighbridges and a new weighbridge office on the access road – this will replace the existing weighbridge at the landfill and the ATRF traffic will also use the new weighbridge facilities once constructed.

The installation boundary at the ATRF will be extended as part of this application to facilitate the new OWC treatment processes.



The installation boundary is shown on Drawing BA235900 Proposed Site Plan which is attached in Application Part 13 Drawings and Plans.

#### **2.4.4 Surrounding Area**

Residential communities within 2km of the site include Horsham, Warnham, Kingsfold and Holbrook. These are found to the south, west, north and east respectively.

There is a scattering of farmhouses and other isolated dwellings to the north, east and west of the site. These include Graylands Lodge and Graylands Farm to the east of the site, Cox Farm and Andrew's Farm to the west and Gunbarn/The Nowhere Houses to the north-west. A further dwelling, 'Bramblehurst', abuts the site to the south-east, adjacent to the site access from Langhurstwood Road. A small row of dwellings lies to the south of this.

There are eight residential properties on the western side of Langhurst Road between its junction with the A246 and the site entrance, and a recently converted farm building residential development on the eastern side of Langhurstwood Road.

A full list of receptors within 1km of the site is provided in Appendix E.

### 3. Condition of Land at Permit Issue

The following sections detail the sources of desk study information searched in order to describe the condition of the site and, in particular, to determine the potential for substances to be present in, on or under the land associated with present and past uses of the site and its surrounding areas.

#### 3.1 Environmental Consents, Permits and Designations

An Envirocheck Report for the site is reproduced in Appendix A. The report provides extensive information and details on:

- waste management licences;
- environmental permits;
- discharge consents;
- groundwater vulnerability;
- trade effluent consents;
- records of any land pollution incidents associated with the site; and
- sensitive land uses

The Multi-Agency Geographic Information for the Countryside (Magic) website was searched to provide details of any:

- European Nature Conservation Sites;
- Special Protection Areas (SPAs);
- Special Areas of Conservation (SACs);
- RAMSAR sites; and
- Sites of Special Scientific Interest (SSSIs).

The search was completed for a 2km and a 10km radius of the site boundary, and the results are contained in Appendix B – these were confirmed by a Nature and Heritage screen completed by the EA during the pre-application process which is attached in Appendix F. In summary the searches identified:

- The application site does not lie in, or have any overlaps with, any statutory, non-statutory or international designated sites;
- The Warnham Site of Special Scientific Interest (SSSI) lies approximately 400m to the north-east of the site boundary and is designated for its national geological interest. The SSSI is represented by Langhurst Wood brick pit, which is an important exposure of the Lower Weald Clay Group above the Horsham Stone, and provides evidence of a range of depositional environments;
- The Warnham local nature reserve (LNR) lies approximately 1,165m to the south of the site boundary;
- There are a number of Local Wildlife Sites (LWS) within 2km of the site, including; Benland Wood, Brookhurst Wood, Brookhurst Gill and Morris' Wood, Tickfold Gill and Warnham Mill Pond; and
- There are areas of ancient woodland within 2km of the site, in all directions including:
  - Allingham Wood
  - Benhams Gill
  - Blackmead Copse
  - Dutshell Copse
  - Furzefield Copse
  - Hawksbourne Wood
  - Holming Wood

- Hurst Wood
  - Langhurst Copse
  - North Heath Copse
  - Old Barn Gill
  - Tickfold Gill
  - Upper Rapeland Wood
- There are three sites with non-statutory designations present within 2km of the site boundary. These are Sites of Nature Conservation Importance (SNCI) designated for their ecological value in a local context and are included in the Horsham District Local Plan:
    - Brookhurst Wood, Brookhurst Gill and Morris' Wood, Horsham (SNCI H07);
    - Warnham SNCI (SNCI H51); and
    - Tickfold Gill, Kingsfold (SNCI H11).
    - Warnham SNCI is also designated as a Local Nature Reserve (LNR).

Given the distance of the sites from the proposed development, no impacts from it are expected on this or any other designated site. A full list of Receptor Details is listed in Appendix E.

## 3.2 Environmental Setting

### 3.2.1 Geology

The local area is situated on an exposed outcrop of Weald Clay, in a broad low-lying vale, and has been the site of major brick making activity for over 100 years.

The Weald Clay deposits, from the Lower Cretaceous period, consist of grey silty clays, shales and mudstones, as well as thin bands of sand, ironstone and shelly limestone. The deposits were formed as a series of estuarine and freshwater deposits. The entire sequence, when present, is over 330 metres thick. The clay minerals present include predominantly illite, kaolinite and mica.

The Weald clay is one of the major formations used in brick making in the UK and reserves in South-East England represent up to 6% of the total national reserves.

### 3.2.2 Hydrogeology

The Enviromark information in Appendix A includes copies of the 'Groundwater Vulnerability' map and the 'Source Protection Zone' map. This information confirms that the site is:

- Situated on Weald Clay Formation, which generally has a negligible permeability and is regarded as a non-aquifer, which means that it is regarded as having insignificant quantities of groundwater. There are no sandstone or limestone bands evident within the clay which could act as a local groundwater source;
- Not located in a ground water source protection zone and no groundwater source protection zones within 2km of the site;
- Not located within 1km of any licensed groundwater abstraction sites; and
- The site is located within a nitrate vulnerable zone.

Groundwater quality is routinely monitored within boreholes around the perimeter of the Brookhurst Wood landfill. Monitoring data for the site indicates that:

- Results for GW boreholes for NH<sub>4</sub>-N with a permit compliance limit 1.99mg/l have some variation through 2021 - 2022, but a large number of boreholes have remained compliant. GW borehole with a NH<sub>4</sub>-N compliance limit of 2.40mg/l has remained compliant but one borehole located close to an old landfill has shown elevated levels of NH<sub>4</sub>-N.
- GW boreholes with compliance limits for Chloride have remained stable and generally below the permit compliance limits.

- GW Mecroprop results have remained below the compliance limit, but with some elevated levels in boreholes closed to the former Cleanaway Warnham Landfill area Other hazardous substances not discussed above but that were detected in groundwater during the 2021 to 2022 monitoring period include the following: arsenic, cadmium, chromium, copper, iron, lead, nickel, toluene and zinc. However, the majority of the results for these substances were below the detection limit on each occasion they were monitored.
- Schedule notices have been supplied for all breaches of the permit. The groundwater continues to be monitored in accordance with the permit and a consultant has been appointed to undertake a groundwater review as part of an improvement condition.

The Hydrogeological Risk Assessment (HRA) for the landfill is kept under review at frequencies in accordance with the Landfill Environmental Permit.

### 3.2.3 Surface Waters

The Envirocheck report, reproduced in Appendix A, provides information on the local surface water features in the area. From the report, the Great Brookhurst Gill runs to the north of the Brookhurst Wood Landfill. It drops in height along the northern boundary and joins the larger Boldings Brook, running to the west of the brickyards and adjacent to the railway line. Boldings Brook is a small tributary of the River Arun, which is classed as a major river by the Environment Agency.

The water classifications for Boldings Brook are regularly assessed by the Environment Agency, and quoted for 2016 in <https://environment.data.gov.uk/catchment-planning/WaterBody/GB107041012910> as:

- Chemical Water Quality - Good;
- Ecological Water Quality - Poor; and
- Overall Water Body – Poor.

The site is classified as Flood Zone 1 (i.e., land outside the floodplain).

The Envirocheck report indicates that there have been up to five surface water abstraction points within 1km of the site at various times. The water was abstracted from what appear to be sumps in the old brick making pit. The water was used for internal applications by the local brickworks.

There are a large number of consents noted in the Envirocheck report in Appendix A, for trade /sewage/wastewater discharges into Boldings Brook, from surrounding industrial and residential sites.

There is a Southern Water Sewage treatment plant to the south-west of the Wareham brickworks and the main London railway line. The treatment plant also discharges into Boldings Brook.

## 3.3 Pollution History

### 3.3.1 Pollution incidents which may have affected the land.

In reviewing the Landmark information, it can be confirmed that no historical pollution incidents within the proposed site boundary have occurred. However, a review of the information for the adjacent land uses has identified:

- One minor pollution incident recorded for the landfill site. This involved the escape of household domestic waste into the Boldings Brook, from the Brookhurst Wood Landfill;
- One minor pollution incident was recorded from Station Rd in Warnham – this was associated with vehicle washings and de-waxing;
- One minor pollution incident was recorded from Tylden House on the Dorking Road - this was an escape of treated sewage caused by a leaking underground pipe; and
- There has been one major pollution incident in the vicinity of the site, resulting from the escape of heating oil into Boldings Brook.

In addition to the above it has been noted that:

- The Warnham Landfill site was constructed, operated/infilled, capped and restored by Cleanaway prior to the site coming into Biffa's ownership and current permit boundary. Biffa developed, operated/infilled, capped and is in the process of restoring the Brookhurstwood Landfill area;
- The base of both the Brookhurst Wood and Warnham Landfill Sites lie below the regional water table. There is a moderate risk of leachate migration from the Warnham Landfill unless regular control/extraction of the leachate is undertaken as it predates the Landfill Directive requirements, the risk is lower for the Brookhurstwood landfill as it is an engineered site in accordance with the Landfill Directive containment requirements. No incidents of leachate contamination have been recorded in the Envirocheck report, nor are reported by Biffa;
- It is understood from a report of the Horsham District Council that the brickworks site and adjacent properties have very low levels of contamination, and that where it is encountered it is in localised hotspots. No further details were given in the report, but the brick quarries did operate a small gauge railway until the early 1990's for the extraction of clay, with loco sheds, associated workshops and fuel storage tanks. These installations or the fuel storage facilities may have been the cause of the localised pollution; and
- Horsham District Council also reported that as well as the pollution hotspots, the former silt ponds and buildings associated with the brickyard may contain asbestos, but it has proved impossible to confirm this assertion.

The complaints involve hydrogen sulphide odours escaping from the northern boundary of the Biffa landfill site in 2001. There are no recent incidents recorded.

### 3.3.2 Historical Land Uses and possible associated contaminants.

The area has an extensive planning history, with mineral uses, including clay extraction and processing, and brick manufacture, dating back more than 100 years.

The first planning permission for the deposit of waste was given to Cleanaway Ltd in 1982 and covered an area in the eastern section of the old Warnham Brick clay quarry.

Further permission was granted for the larger northern part of the clay quarry, later in 1982.

The latest planning permission DC/2919/06 was granted in 2009, to fill and re-profile the valley between the old former Cleanaway Landfill and the current Biffa landfill. This extended the permitted landfill activity until 31st December 2016, designated as Phase 6 by Biffa. The landfill is currently operated in accordance with Environmental Permit EPR/BV98961Y, with all landfill disposal activities and final capping of the site now completed. The current main activities at Brookhurstwood Landfill include landfill restoration, environmental controls for gas and leachate and routine environmental monitoring.

In 2010, Biffa had planning permission granted on the Brookhurst Wood site for a Mechanical Biological Treatment (MBT) plant. The MBT plant is being used to facilitate the 25 year West Sussex municipal waste contract and has a capacity of 327,000 tonnes per annum.

In 2014 Biffa gained an Environmental Permit to operate a new Aggregate Treatment and Recycling Facility (ATRF) on the site. The recycling plant has a maximum throughput of 25 tonnes per hour, although the actual hourly throughput will be driven by the customer demand, as will the estimated annual throughput of 60,000 tonnes.

A review of the historical land use maps for the site and surrounding area are summarised in Table 2 below.

**Table 2. Historical Land use**

Map Period	Land use
1879 - 1880	<ul style="list-style-type: none"> <li>• No development evident on the site.</li> <li>• Langhurst Wood evident to the north.</li> <li>• Warnham Station located to the southeast.</li> <li>• Surrounding land use mainly agricultural.</li> </ul>
1898 - 1899	<ul style="list-style-type: none"> <li>• No change to site or the majority of the surrounding land use</li> <li>• Warnham Brickworks present to the southeast.</li> </ul>

Map Period	Land use
1913 - 1914	<ul style="list-style-type: none"> <li>• Brickworks buildings evident to the west and brickworks area shown encroaching on northwest part of site although no buildings present in this area.</li> <li>• Engine shed, tank and tramway for the brickworks evident outside the site to the west/southwest. Tramway encroaches into site boundary to the west.</li> <li>• Kiln located in an area to the northwest of the site.</li> <li>• No other changes noted to the external land use.</li> </ul>
1961 - 1962	<ul style="list-style-type: none"> <li>• Development of further buildings at the brickworks to the west.</li> <li>• Engine shed, tank and tramway to the southwest no longer evident.</li> <li>• New engine shed and tanks shown to the northeast of the site.</li> <li>• No other changes evident to the surrounding land use.</li> </ul>
1980 - 1982	<ul style="list-style-type: none"> <li>• 2 ponds evident on the development site believed to be associated with brickworks.</li> <li>• Brickworks to the east now include two additional ponds.</li> <li>• Langhurst wood no longer present although smaller Brookhurst Woods shown to the northeast.</li> <li>• 2 Clay pits now evident immediately to the north of site and the kiln to the northwest has been replaced by a conveyor.</li> <li>• New works buildings present beyond the clay pits to the north.</li> <li>• Further clay pits shown beyond Brookhurst Woods to the northwest.</li> <li>• Sewage works now present to the southwest.</li> <li>• No other changes noted to the surrounding land use.</li> </ul>
1991 - 1993	<ul style="list-style-type: none"> <li>• No further changes noted on the site or to the brickworks to the west.</li> <li>• Further industrial buildings to the immediate south.</li> <li>• Further development of the industrial area to the north of the clay pits – these are shown as a factory and a depot.</li> <li>• Commencement of landfilling at Brookhurst Wood Site.</li> <li>• No other external land use changes.</li> </ul>
1999-2000	<ul style="list-style-type: none"> <li>• A drain is now shown on the site between the two ponds.</li> <li>• No further development of the land use immediately adjacent to the site, although the industrial units beyond the clay pits to the north are now shown as a factory and Horsham Business park.</li> </ul>
2008	<ul style="list-style-type: none"> <li>• No further development on the site or to the adjacent brickworks.</li> <li>• The clay pit to the immediate north of the site is now shown as disused workings.</li> <li>• The second clay pit to the north is now shown as Brookhurst Wood Landfill.</li> <li>• The industrial complex beyond the clay pits/landfill is shown as containing Broadland Business Campus.</li> <li>• No other development of the surrounding land use is noted.</li> </ul>

### 3.3.3 Visual and Olfactory evidence of existing and historic contamination

No visual or olfactory contamination is currently evident on the ATRF site and proposed OWC area which will be used for the new treatment processes.

It is recognised that there have been historic issues with odour impacts associated with the Biffa landfilling operations along the northern border next to the Great Brookhurst Gill boundary. These events occurred in 2001, and corrective action has been undertaken by Biffa and there have been no further official complaints since this time. During July 2023 odour issues have been associated with the adjacent, separately permitted Biffa West Sussex MBT Facility. The odour issues are linked to the performance of the odour control system and the volumes of waste stored within the waste reception hall. A programme of work to improve odour management and control is now in place at the MBT Facility.

### 3.3.4 Other Potentially Contaminative Industries

None recognised that are likely to affect the site.

### 3.3.5 Evidence of damage to pollution prevention measures

There is no evidence of any damage to pollution control measures that have been put in place upon the site during previous years.

The wider Brookhurst Wood site area currently hosts:

- Biffa site offices, weighbridge and an environmental compound (landfill gas fired generators/leachate treatment plant) to the north;
- A derelict building known as 'Burt's Barn' is situated to the northern end of the development area and will be demolished as part of the OWC construction;
- A Mechanical biological treatment (MBT) is situated to the southeast .

A Phase II site investigation by Swan Environmental in 2023 of the OWC development area identified that:

- There was no visual or olfactory evidence of contamination;
- Made ground is present across the site to depths of up to 1.7m bgl;
- Analysis and ongoing monitoring identified one location with asbestos, one location with elevated methane and widespread elevated sulphates in the made ground and underlying natural clay;
- Localised perched groundwater may be present at shallow depth and may be encountered in excavations as the site is developed; and
- The site is not in an area where radon protection measures are required.

### 3.3.6 Baseline Data

There have been several reports containing information for the site and surrounding areas. The main reports studied have included:

- November 2003, Brookhurst Wood Landfill, PPC Application, SLR Consulting Ltd;
- March 2004, Brookhurst Wood, Borehole logs, Jacobs Babbie Laboratories;
- September 2006, Brookhurst Wood: Draft Hydrogeological Risk Assessment, Executive Summary, SLR Consulting Ltd; and
- June 2010, Brookhurst Wood, Geo-environmental Report, Capita Symonds Ltd.
- July 2023, Brookhurst Wood Generic Quantitative Risk Assessment, Swan Environmental

Extensive details of all measured soil, gas and groundwater values are included in these reports. Extracts from the most recent report from 2010 is included in Appendix C and from 2023 in Appendix D.



## 4. Permitted Activities

### 4.1 Site Permitted Activities

#### 4.1.1 Existing Wider Site Activities

The non-hazardous landfill site (Brookhurst Wood Landfill) which is currently undergoing final restoration was operated under permit reference EPR/BV98961Y dated 5th September 2017 for landfill operations, with Variation V016 issued on 16/03/2021 to facilitate the review of various compliance requirements.

The adjacent MBT facility is regulated under environmental permit EPR/HP3238GW which was first issued on 05/07/2010 with the most recent variation (V005) issued on 3<sup>rd</sup> November 2022 following the submission of the site response to the EA Regulation 61 review of the permit. .

Existing permitted activities will continue to take place at the site. No changes to their operation have been made as a result of the proposed development.

#### 4.1.2 Existing ATRF Activities

The Aggregate Treatment and Recycling Facility (ATRF) is operated under a separate waste operation permit EPR/AB3700LS to the landfill permit. The ATRF is a wet process which treats aggregates, gully washings and similar non-hazardous wastes to recover materials such as sand, aggregate, metals, organics, etc.

The waste types accepted are street cleansing residues and similar aggregate materials which fall under the EWC codes stipulated in Schedule 2, Table S2.1 of Environmental Permit EPR/AB3700LS. Plant intake capacity is up to 60,000 tpa.

In accordance with Annex II of the Waste Framework Directive as amended in 1996 (96/350/EC) the waste management operations to be undertaken at the ATRF are as follows:

**Table 3. Waste Management Operations at the ATRF**

Waste Management Operations	
R3	Recycling or reclamation of organic substances (not solvents) including biological treatment processes.
R4	Recycling or recovery of metals and metal compounds (bulky Recyclable)
R5	Recycling or recovery of other inorganic materials (e.g., glass, plastics, sand)
R13	Storage of recyclable waste prior to any R1 – R12 operations. For this site this will include onsite recycling/recovery activities or storage prior to transfer to a recycling or recovery activity.

#### 4.1.3 Proposed New Treatment Operations

##### 4.1.3.1 OWC Facility

The OWC will accept up to 60,000 tpa of green waste for composting and 30,000 tpa wood waste for shredding only.

The OWC will be located on a concrete pad and will be supported with a new surface water drainage and collection system. The facility will include:

- incoming waste storage areas comprising bays constructed with concrete block walls for both green and wood waste;
- mobile shredding unit which will shred incoming wood back into the storage bay and will shred green waste while moving along the treatment pad to directly for the windrows;
- enclosed screening and separation building which comprises feed hopper, screens, conveyors and Windsifter unit. The screening and separation plant has the flexibility to be used to treat incoming waste as well as the treated green waste following maturation stage.

- the screening and separation building will be designed with grey water collection which can be used for moisture control on the windrows or for dust suppression;
- water collection channels and storage lagoons to facilitate settlement and subsequent recirculation as process water for moisture control on the windrows and for dust suppression;
- two water storage tanks that can hold up to 70,000 litres each which provide buffer capacity for the drainage storage capacity and can facilitate removal of the OWC surface water either by road tanker or via discharge to sewer;
- a weighbridge office and incoming/outgoing weighbridges; and
- bunded fuel storage tank

The proposed OWC treatment process will be added into the extended installation boundary as a an EPR Schedule 1 installation as follows:

- Section 5.4 Part A(1) (b) (i) – recovery or mix of recovery and disposal of non-hazardous waste exceeding 75 tpd by biological treatment (open windrow composting).
- Waste Operation – shredding, screening and separation of wood waste streams for recovery purposes.

Directly Associated Activities (DAA) include:

- the storage of incoming waste;
- storage of processed wood, finished compost and non-compost fraction;
- recycling/reclamation of organic substances (not solvents) through a physical treatment process (shredding, screening and separation);
- process water collection and storage; and
- surface water collection and storage.

The proposed OWC operations are detailed further in the Technical Plan (ref: 606843711-ACM-00XX0RP-EN-TP-R03) submitted with this variation. It is expected the EWC codes approved will be detailed in Environmental Permit EPR/AB3700LS, Schedule 2, Table S2.2.

**Table 4. Waste Operations at the OWC**

Waste Management Operations	
R3	Recycling or reclamation of organic substances (not solvents) including biological treatment processes.
R4	Recycling or recovery of metals and metal compounds (bulky Recyclable)
R5	Recycling or recovery of other inorganic materials (e.g., glass, plastics, sand)
R13	Storage of recyclable waste prior to any R1 – R12 operations. For this site this will include onsite recycling/recovery activities or storage prior to transfer to a recycling or recovery activity.

#### 4.1.3.2 New ATRF Crushing Operations

A mobile crusher will be used to process both additional non-hazardous waste streams and the oversize fraction produced by the initial ATRF screening activities. The crusher operation will be added to the permit and regulated a new waste operation.

The proposed crushing processes wastes are detailed in the Technical Plan (ref: 606843711-ACM-00XX0RP-EN-TP-R03) submitted with this variation. It is expected the LoW codes approved will be detailed in Environmental Permit EPR/AB3700LS, Schedule 2, Table S2.1.

**Table 5. Waste Operations associated with the crusher.**

Waste Management Operations	
R5	Recycling or recovery of other inorganic materials (e.g., glass, plastics, sand)
R13	Storage of recyclable waste prior to any R1 – R12 operations. For this site this will include onsite recycling/recovery activities or storage prior to transfer to a recycling or recovery activity.

## 4.2 Non-Permitted Activities

Non-permitted activities at the site include use of the existing landfill office building for site management and admin purposes and a new weighbridge office building. No other activities are carried out at the site.

## 4.3 Environmental Risk Assessment

### 4.3.1 Methodology

The methodology adopted is described in detail in Environment Agency Report CLR11: Model Procedures for the Management of Land Contamination<sup>1</sup> and relies on the development of a site-specific conceptual site model (CSM) consisting of three components:

- A source of contamination, for example due to historical site operations;
- A pathway, a route by which receptors can become exposed to contaminants. Examples include vapour inhalation, soil ingestion and groundwater migration;
- A receptor, a target that may be exposed to contaminants via the identified pathways. Examples include human occupiers/users of the site, controlled water receptors, property or ecosystems.

For a potential risk to either environmental and/or human receptors to exist, a plausible pollutant linkage involving each of these components must exist. If one of the components is absent then a pollutant linkage, and thereby potentially unacceptable risk, is also unlikely to exist. Where all three components are or may be present, a potentially complete pollutant linkage can be considered to exist. This does not automatically imply the presence of unacceptable risk, but further investigation of the potential pollutant linkages is required.

The potential sources of contamination on or in the vicinity of the site, receptors on or near site, and pathways on or near the site are discussed within this section. Below is a summary of the CSM:

### 4.3.2 Potential Sources of Contamination

Potential sources of contamination have been identified from historic and current uses of the site. These are as follows:

**Table 6 Potential Sources of Contamination**

Potential Onsite Source	Potential Contaminants
<b>On-site Sources</b>	
Areas of made and unmade ground associated with former brickworks.	<ul style="list-style-type: none"> <li>• Principally relate to fuel for the kilns, with possible spillage or leakage of oil (TPH) from storage tanks or supply lines.</li> <li>• Disposal of ash from coal-fired kilns which may contain metals, polyaromatic hydrocarbons (PAH), phenols, BTEX, MTBE and sulphates.</li> <li>• Asbestos, unknown fill materials, PAH, hydrocarbons and metals associated from the construction and later demolition of the historical kilns and brickworks.</li> </ul>
Former and current site roads	Heavy metals, TPH and PAH.
Electricity sub-station	Potential source of PAH and PCB contamination.
Landfill operations to the north and northeast of the site.	Source of landfill gas, potentially contaminated leachate hydrocarbons, metals asbestos and inorganic contaminants.
<b>Off-site Sources</b>	
Adjacent Railway	Heavy metals (Cd, Cr, Cu, Ni, Pb and V), sulphate, asbestos, PAH, hydrocarbons, inorganics and phenols.
Agricultural land	Pesticides, Insecticides metals, TPH and PAH

### 4.3.3 Potential Receptors

The following potential receptors have been identified which would be adversely affected by any contamination at the site:

<sup>1</sup> The Environment Agency, 2004. CLR11: Model Procedures for the Management of Land Contamination.

**Table 7. Potential Receptors**

Potential Receptor	Description
Human Health	<ul style="list-style-type: none"> <li>Construction workers,</li> <li>Future site users; and</li> <li>Operational staff.</li> </ul>
Controlled Waters	<ul style="list-style-type: none"> <li>Groundwater within the underlying made ground deposits;</li> <li>Groundwater within the underlying bedrock;</li> <li>Site lagoons and drainage systems; and</li> <li>Boldings Brook.</li> </ul>
Construction Materials/Buildings	<ul style="list-style-type: none"> <li>Risk to concrete foundations and services; and</li> <li>Risk to buildings from ground gas.</li> </ul>
Vegetation	<ul style="list-style-type: none"> <li>Vegetation and landscaping along all site boundaries.</li> </ul>

#### 4.3.4 Potential Pathways

Potential pathways have been identified, which could link the potential sources with the potential receptors. These pathways are discussed by receptor type below in consideration of the redevelopment of the site:

**Table 8. Potential Pathways**

Potential Pathway	Description
Controlled Waters	<ul style="list-style-type: none"> <li>Migration of contaminants with sub-surface infiltration;</li> <li>Shallow ground water flow</li> </ul>
Ground Gas	<ul style="list-style-type: none"> <li>Have the potential to migrate via permeable strata within the made ground or through service trench backfill;</li> <li>Emissions to air from landfill gas engines; and</li> <li>Potential for landfill gas at ground level from the landfill activities.</li> </ul>
Soil	<ul style="list-style-type: none"> <li>Risk from organic vapours and migrated landfill gas during construction and maintenance activities and for future site users;</li> <li>Potential for direct contact and potentially contaminated soils during future construction activities; and</li> <li>Potential for direct contact by future users from any landscaped area will be low as no landscaping proposed for the new OWC.</li> </ul>

#### 4.3.5 Qualitative Risk Assessment

A Qualitative Risk Assessment has been undertaken for these potential source-pathway-receptor linkages based on current DEFRA (Guidelines for Environmental Risk Assessment and Management) and CIRIA (C552) guidance. This assessment is based on consideration of both:

- The likelihood of an event (probability – considers both the presence of the hazard and receptor and the integrity of the pathway);
- The severity of the potential consequence (considers both the potential severity of the hazard and the sensitivity of the receptor).

The method of dealing with identified risks and the level of significance of those risks will be a function of site use. The risks associated with each potential pollutant linkage considers the findings of the site investigation work undertaken at the site and are considered in Table 9 on the next page.

A Generic Quantitative Risk Assessment of the OWC area was completed in July 2023 and is presented at Appendix D.

**Table 9. Qualitative Risk Assessment**

Source	Pollutants	Pathway	Receptor	Associated Hazard (Severity)	Likelihood of Occurrence	Potential Impact
Potential contaminants within materials	Fuel spillages Leak from electricity sub-station Made Ground Natural contaminants in unmade ground/ underlying strata	Direct contact, ingestion and inhalation.	Site users	Effect on human health (medium)	Unlikely: Hardstanding will prevent contact with underlying materials.	Low risk.
			Future construction / maintenance	Effect on human health (medium)	Unlikely: Site workers or potential future construction / landscaping workers could be exposed to localised sub-surface contaminants during works. The use of appropriate PPE should mitigate this risk.	Very low risk.
		Surface run-off.	Aquatic resources, ecology and subsequent users including humans	Lateral movement to surface watercourses. (medium)	Unlikely: Materials are generally very low permeability with high attenuation.	Moderate/low risk
		Direct contact with foundations, services and migration in groundwater.	Construction/maintenance workers and site users	Effect on human health (medium)	Moderate: Sulphates known to occur naturally in Weald Clay, but ground is impermeable.	Moderate
		Direct Contact.	Building structures and services	Aggressive chemical attack	Low likelihood: Low levels of contamination characterised via the site investigation. Mitigation measures can be taken during future construction phases in order to reduce the likelihood of occurrence. It is considered that concrete should be designed in accordance with BRE Special Digest 1 <i>Concrete in Aggressive Ground</i> .	Very Low Risk
		Uptake via root.	Flora and fauna.	Effect on flora / fauna [Minor]	Unlikely: Vegetation is limited to the scrubland in the northern end of the site, with trees and shrubs located along the eastern, southern and western site boundary. Site vegetation showed no signs of stress or die-back during site visit. No protected species are present.	Very Low risk
Landfill operations	Leachate	Migration of contaminants with sub-surface infiltration and shallow groundwater flow.	Aquatic resources, ecology and subsequent users including humans	Lateral movement to surface watercourses. (medium)	Low: Landfill is engineered to control leachate. Ground is generally impermeable and will prevent flow and attenuate contamination.	Moderate/low risk
	Landfill Gas	Airborne	Human health		Moderate: Significant gas will be produced. Site controls include landfill engineering, gas capture/management using gas engines and flare.	Moderate/low risk

Source	Pollutants	Pathway	Receptor	Associated Hazard (Severity)	Likelihood of Occurrence	Potential Impact
Ground gas associated with the landfill operations, made ground / fill material present on-site.	Ground gases (including methane and carbon dioxide).	Gas migration and diffusion via permeable strata into enclosed spaces in/under buildings and structures	Construction workers and future maintenance works and site users.	Explosive risks and impact on human health (severe)	Low: Materials are generally impermeable so risk will reduce with distance from landfill	Moderate to Low Risk
			Building structures and services			
Offsite source – railways and agricultural land.	Heavy metals, sulphate, organic compounds	Direct contact, ingestion and inhalation	Construction workers and future operators/users	Health risks including skin irritation (medium)	Low likelihood Hardstanding will prevent contact with underlying materials. Construction workers to wear full and correct PPE.	Low risk
		Surface run off.	Aquatic resources, ecology and subsequent users including humans	Lateral movement to surface watercourses	Low Likelihood Hardstanding will prevent contact with underlying materials.	Low risk
		Leaching / dispersion	Aquatic resource – groundwater abstraction wells/surface water	Downward migration into groundwater	Low/moderate likelihood Site drainage to control surface water.	Low/moderate risk
		Direct contact	Building structures and services	Aggressive chemical attack	Low Likelihood Hardstanding will prevent contact with underlying materials.	Low risk

#### **4.3.6 Conclusion**

In summary, the risk of the concentrations of chemicals of potential concern encountered on the site posing a risk to human health is considered to be low and the risk to controlled waters is assessed as low to moderate/low.

#### **4.4 Operational Environmental Risk Assessment**

Environmental risk assessments have been completed for the proposed OWC operations and new mobile crushing operations at the ATRF. These are included in the:

- Odour Management Plan (Application, Section 5);
- Dust Emissions Management Plan (Application, Section 6); and
- Impact Assessment Report (IAR) document (Application, Section 9)



## Appendix A Envirocheck Report

## Appendix B MAGIC Screen

## Appendix C Capita Symonds 2010 Report

## Appendix D Swan Environmental 2023 Report

## Appendix E List of Receptors

Receptor	Description	Type	Approximate Distance (m)	Direction from Site
R1	Greylands Industrial Park	Human/Commercial	546m	E
R2	Greylands Lodge	Human/Commercial	260m	E
R3	Greylands Farm	Human	596m	SE
R4	Andrews Farm	Human	650m	SW
R5	Lower Chickens Farm	Human	770m	W
R6	Cox Farm Lodge	Human/Residential	566m	W
R7	Cox Farm	Human	330m	W
R8	Sussex Camper Vans	Human/Commercial	394m	NE
R9	Orchard Lodge	Human/Residential	550m	NW
R10	Durford Hill Farm	Human	668m	NW
R11	Fisher Clinical Services	Human/Commercial	587m	N
R12	Broadlands Business Centre	Human/Commercial	862m	N
R13	Weinerburger Brickworks and adjacent Business Park	Human/Industrial	427m	S
R14	Warnham Railway Station	Human/Commercial	600m	S
R15	South Lodge	Human/Residential	345m	NE
R16	Boldings Brook Academy	Human	575m	W
R17	Langhurst Moat Cottage	Human	399m	SE
R18	Holmwood	Human	860m	N
R19	Gunborn Crossing Cottages	Human	682m	N
R20	Nowhere House	Human	754m	NNW
R21	Richmond House	Human	817m	NNW
R22	Wood Farm	Human	948m	NNW
R23	Upper Chickens - Houses and Pet Supply Company	Human/Commercial	980m	NNW
R24	Highland House, The Mount & other residences	Human	610m	NW
R25	Dog & Duck Pub	Human	777m	NW
R26	Geerings	Human	900m	W

Receptor	Description	Type	Approximate Distance (m)	Direction from Site
R27	Police House & other adjacent residences	Human	975m	SW
R28	Westons Farm & Westons Place Residential Properties	Human	920m	SW
R29	Lower Gate House	Human	652m	S
R30	Pondtail Farm	Human/Commercial	915m	SSW
R31	Brittaniacrest Recycling	Human /Industrial	165m	S
R32	Biffa MMRC	Human /Industrial	75	SE
R33	Panel 2 Panel & Greens	Human/Commercial	563m	S
R34	Sewage Works adjacent to Farm	Human/Industrial	525m	SW
R35	Wealdon	Human	470m	SE
R36	Denhams Auctioneers	Human /Commercial	530m	NW
R37	Sussex Health Centre	Human	580m	NW
R38	Male Journey	Human	600m	NW
R39	White Cottage Cake Company	Human	630m	NW
R40	Houses on Station Road	Human	620m	S
R41	Little London Hill	Human	650m	W
R42	Vale Stud Riding School	Human	886m	NW
R43	Biffa ATRF	Human /Industrial	<10m	N & W
R44	Biffa Landfill	Human /Industrial	25	N

## Appendix F Conservation Screen from EA



