3 Need and Alternatives Considered

3.1 Introduction

3.1.1 This chapter of the Environmental Statement (ES) provides a summary of the need for the project and the main alternatives considered by Britaniacrest during the environmental assessment process.

3.1.2 As set out in Chapter 1 of this ES, the 2017 Environmental Impact Assessment (EIA) Regulations are the relevant consideration for the proposed 3Rs Facility. The regulations require an ES to include:

'A description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment.'

3.1.3 This chapter therefore sets out the key reasons for the selection of the project site, together with a description of the alternative design and layout options that have been considered. Further information is provided in the Planning Statement and Design and Access Statement that accompany the planning application.

3.2 Need for the Proposed Facility and Site Suitability

Need for Recycling and Recovery Facilities in the UK and West Sussex

3.2.1 It has been the objective of the UK and Europe for many years to reduce the quantity of waste being sent to landfill. This can only be achieved if there is infrastructure available to allow the waste to be recycled or recovered. Whilst the UK has made major strides in reducing the landfilling of waste, and the UK Government and local authorities have spent over £2 billion in recent years, investing in such infrastructure, this has been almost exclusively for municipal wastes. Yet the Waste Framework Directive (WFD) sets the same objectives for commercial and industrial wastes as it does for municipal waste. Whilst there is around twice the quantity of this waste compared to municipal waste, there are few facilities available that enable the waste from shops and businesses to be properly recycled and recovered. As a result, up to 9 million tonnes of commercial and industrial waste is landfilled in or exported from the UK, and the waste is travelling further afield as landfill sites are being closed.

3.2.2 Department for Environment Food and Rural Affairs (Defra) "Statistics on UK Waste", published 27 February 2018 states that the estimated annual commercial and industrial waste production in the UK in 2016 was circa 32.2 million tonnes (Defra, 2018). Statistics on commercial and industrial waste are not easily obtained and, therefore, to determine the destination of that waste would require the waste transfer documents to be collated and the locations to which the waste is taken to be mapped. What is known, however, is that in Kent, East Sussex and Hampshire there are now no landfill sites at all for active non-hazardous waste. In West Sussex, the landfill capacity available is primarily designated for use for municipal waste and the landfill will be full within the next year. Even household waste arising in West Sussex requiring to be landfilled may need to be transported to Redhill, Surrey.

3.2.3 In August 2017, Biffa published its report, "The Reality Gap" in which the company updated its 2015 study, and predicted a potential residual waste treatment capacity gap in the UK of 4.4 million tonnes per annum (mtpa) or up to 5.9 mtpa by 2025 if further disposal infrastructure is not developed. This was followed in September 2017 by Suez Environment, who published their report "Mind the Gap", reinforcing Biffa's conclusion, and evidencing the company's claim that the UK could face a 'disaster scenario' with regard to a shortage of waste treatment infrastructure over the next decade. These reports have since been followed by

the Environmental Services Association, report (ESA, 2017) that estimates that if no further infrastructure is built, there will be an EfW capacity gap of circa 17 million tonnes per annum by 2030.

3.2.4 There is therefore a clear need for facilities to treat commercial and industrial waste in the UK.

Proposed 3Rs Facility Site

3.2.5 Britaniacrest Recycling Ltd currently operates a Waste Transfer Station (WTS) at its site at the old Wealden Brickworks, Langhurstwood Road, Horsham, West Sussex. The facility has planning permission to handle up to 230,000 tonnes per annum of industrial and commercial waste.

3.2.6 Currently the operation at the old Wealden Brickworks is confined to receiving wastes, including deliveries from skip collections from local businesses, separating what is viable to separate and bulking up for processing and recovery elsewhere. With the exception of wood, any active waste has to be transferred to Hookwood, where it is shredded and converted into a refuse derived fuel (RDF) and exported to continental Europe. With the current facilities, it is not possible to extend the recycling activity significantly without investment in infrastructure, and other than wood and demolition waste, the amount of waste the site can receive is limited. Britaniacrest Recycling Ltd is proposing to develop the 3Rs Facility at its old Wealden Brickworks site to enhance the waste management operations at the site, which would anticipate achieving a diversion from landfill of around 95% of the waste coming in to the facility.

3.2.7 In September 2016, West Sussex County Council (WSCC) announced that it would issue tenders for the transport and treatment of the RDF produced by the Mechanical Biological Treatment (MBT) plant operated by Biffa at the site adjacent to the proposed 3Rs Facility. In September 2017, WSCC indicated its intent to award the contract to Britaniacrest Recycling for a nominal five year period. During the contract period the RDF will be transported by heavy goods vehicles (HGVs) to UK docks and exported to energy recovery facilities within the European Union. If constructed, and subject to public procurement regulations, the proposed 3Rs Facility would provide a potential treatment point for the RDF, significantly reducing the carbon footprint compared to the current export arrangements and maintaining the resource within the UK economy.

3.2.8 The new facility would replace the existing Waste Transfer Station and would take commercial and industrial waste or similar, and sort and segregate materials such as metals, plastics and rubble and recover their value using the latest sorting technology. The energy content of the residual material left over would be recovered using well established and proven thermal treatment technology.

3.2.9 Electricity would be exported to the local electrical distribution grid. These processes would provide a sustainable alternative to landfill disposal, avoid the use of fossil fuels and save primary materials.

Conclusion

3.2.10 There is a clear need for state-of-the-art facilities to allow commercial and industrial waste to be treated, recycled and energy to be recovered in the UK. This would avoid long distance waste travel and export of materials, such as RDF, to Europe for energy recovery.

3.2.11 In order to meet the challenges facing the UK in terms of lack of landfill capacity and the need for waste treatment, leading new facilities are required that can treat, recycle and recover energy from commercial and industrial waste.

3.2.12 The existing Britaniacrest site is confined to receiving wastes, including deliveries from skip collections from local businesses, separating what is viable to separate and bulking up for processing and recovery elsewhere. With the current facilities at the site, it is not possible to extend the recycling activity significantly without investment in infrastructure, and the amount of waste other than wood and demolition waste the site can receive is limited.

3.2.13 Development of the site to provide the proposed 3Rs Facility would provide a modern facility suitable for waste treatment, recycling and energy recovery. The site already operates as a waste handling facility and is large enough to accommodate the required functions within the existing site boundary.

3.2.14 The site provides an opportunity to create a facility positioned in an area where there is currently a lack of suitable landfill capacity for such wastes. The main reasons for the selection of the site for the proposed use include:

- Existing use as a waste transfer station, with planning permission to handle up to 230,000 tonnes per annum of industrial and commercial waste;
- Allocation of the site within the Waste Local Plan for waste transfer/recycling/recovery use;
- Location within an area with limited landfill capacity, resulting in long distances travelled for waste treatment or energy recovery (including export of RDF overseas);
- Ability to accommodate the new use within the existing site boundary;
- Site ownership by family business with over 40 years' experience in energy recovery, recycling and haulage;
- Location in an area of existing built development, on a former brickworks site, adjacent to the railway and Brookhurst Wood landfill site;
- The site is not subject to any statutory environmental designations and is at low risk of flooding;
- The site provides good public transport links, including access to the A24 and A264; and
- Ability to accommodate proposed use without any increase in traffic flows during the operational phase.

3.3 Alternative Layout and Technology Options Considered

Introduction

3.3.1 The evolution of the project design and site layout has been an iterative process, which has been undertaken during the period 2015-2018 and has taken account of input from a range of sources, including:

- Consultation, including in particular, feedback from statutory and non-statutory consultees and from the previous application at the site;
- EIA topic specialists, resulting from the findings of site surveys or assessment work; and
- A wide range of other specialist consultants forming part of the wider team, including specialists in planning, energy, drainage and utilities.

3.3.2 This section sets out the key stages of the design process and the main reasons for the selection of the current design.

Alternative Waste Management Technology Options

3.3.3 In considering alternative technology options and determining the ultimate technology option proposed at the site, the applicant sought advice from Vismundi Limited.

3.3.4 Vismundi Limited assessed the technology options available for the relevant waste streams and the resulting Alternative Technologies Assessment report is included at Appendix 3.1 to this chapter. The scope and conclusions of the report are summarised below.

3.3.5 The assessment considered the alternative processes for the treatment of the waste streams to be managed at the site.

3.3.6 The proposed 3Rs Facility would receive commercial, industrial and municipal wastes that have not been recycled and, in the absence of such a facility, would have been subjected to minimal sorting and materials recovery, and therefore would have largely been disposed of at landfill. A basic assumption of the assessment, taking into account the waste hierarchy, was that landfill was not an alternative option for these wastes. Furthermore, since the facility would be the receiver of the wastes and would not be engaged directly with the waste producer, nor with the method of collection of the wastes, alternative options for the collection methodologies and logistics were not considered.

3.3.7 The technology options considered included:

- Mechanical sorting and treatment;
- Biological processing in the form of:
  - Composting;
  - Anaerobic digestion; and
  - Mechanical biological treatment.
- Thermal treatment in the form of:
  - Combustion or incineration in the form of:
    - Moving grate combustion; and
    - Fluidised bed combustion; and
  - Gasification and pyrolysis.

3.3.8 The analysis concluded that mechanical pre-treatment followed by thermal treatment would be the best technology choice. Gasification was identified as a possible thermal treatment option, but was dismissed primarily due to its significantly smaller operational experience base. Pyrolysis does not currently demonstrate any environmental benefit and has a significantly weaker business case.

3.3.9 In view of the type of material to be treated at the site, alternative treatment technologies, such as composting, anaerobic digestant or mechanical biological treatment (with either of the latter processes), were not considered to be a viable option.

3.3.10 On balance, mechanical pre-treatment with energy recovery using modern, state of the art technology was identified as the preferred option. The main factors in this choice included:

- Technical performance;
- Reliability; and
- Environmental performance, including emissions.

3.3.11 The selected technology is flexible and robust and would allow the facility to achieve “recovery” status in accordance with the Waste Framework Directive, providing an alternative to landfill in addition to much needed renewable energy.

Alternative Designs

3.3.12 National planning policy highlights the importance of good design as a key contributor to providing sustainable solutions to new development and working practice. The design of the facility has drawn upon a number of considerations, including the surrounding landscape context, topography, proposed facility requirements and layout and the views and aspirations of the local community.

3.3.13 The process has necessarily been iterative in nature, responding to technical and environmental considerations. The key design aims can be summarised as:

- Retention and enhancement of existing landscape features;
- Provision of new landscape treatment and minimising the height of the building;
- Consideration of colour options for the main building, taking into account its landscape context;
- Efficiency of building/plant layout;
- Heavy goods vehicle (HGV) access and manoeuvrability;
- Implementation of sustainable design;
- Securing sustainable drainage and minimising impacts on adjacent watercourses;
- Optimisation of the existing ground conditions, topography of the site and surroundings;
- Minimising the environmental effects of the proposed development; and
- Achievement of environmental improvements.

3.3.14 The design has been guided from the outset by the landscape context, the site configuration, topography and the operational needs of the facility.

3.3.15 In particular, the design has evolved through an understanding and appraisal of the site's context and the subsequent architectural design evolved through an iterative process guided by this, together with consultation with key stakeholders and outputs from the EIA process.

3.3.16 Input from the following key stakeholders has taken place at various stages throughout the evolution of the project and has influenced and shaped the design of the proposals:

- Formal EIA scoping process: A formal Scoping Opinion was requested from the planning department of West Sussex County Council. The Council in turn consulted: The Environment Agency, Natural England, County Council (Highways, Environment, Heritage and Ecology), Warnham and Horsham District Councils, Gatwick Airport Aerodrome Safeguarding and Langhurstwood Road Residents Group.
- EIA process: Key outputs and findings from the EIA process have been fed back to the architect team to enable the design to be responsive to the findings of the assessments and to incorporate recommended mitigation measures into the design of the facility, where appropriate.
- Gatwick Airport Aerodrome Safeguarding: A separate specific consultation was held with Gatwick Airport Aerodrome Safeguarding in order to confirm any specific safeguarding measures that may influence the design.
- Process engineers: The architect has worked closely with the process engineers to ensure that the emerging design would meet technical and operational requirements of the facility.
- Community Liaison Group: A presentation by the applicant's agent of the early design concept was made to the Community Liaison Group for the project and their feedback, particularly in terms of scale, finish materials and cladding was fed into the design.
- Committee report on the December 2016 application: The report of the planning committee in July 2017 has been reviewed to consider the key reasons for the recommendation for refusal of the December 2016 application on the same site. This has been taken fully into account in developing the updated design.

3.3.17 The design process has been heavily influenced by the aspirations of Britaniacrest Recycling Ltd for a functional and cost effective design that relates to the context of the site. Account has been taken of the potential effects of the buildings upon the surrounding landscape. This has been considered through the

visual assessment, using agreed viewpoints from the surrounding area with accurate site and building levels to consider the predicted view.

Design Process Prior to 2016 Application

3.3.18 This section sets out the evolution of the design prior to submission of the previous planning application in December 2016. In developing the design of the facility, the applicant considered a number of alternative layouts and designs for the site. The options considered during the design evolution process are summarised in Figure 3.1a-h.

3.3.19 Initial design options looked at separation of different elements of the design; the offices, workshop and waste transfer facility. These options also looked at the entrance route and the impact of the topography of the site.

3.3.20 Option 2 (Figure 3.1b) sought to include sustainable characteristics, such as maximising natural lighting in order to reduce the use of artificial lighting. This was to be achieved through the use of large areas of translucent cladding (see Figure 3.1c). However, when the potential landscape and visual effects of this option were appraised it was considered that, taking into account the 24 hour nature of the operations, the resulting night time light spillage would lead to an increase in potential impacts and, as a result, the amount of translucent cladding was reduced to a simple band that breaks up the vertical form of the boiler hall.

3.3.21 Option 4 (Figure 3.1e) was developed from the initial layout of Option 1 (Figure 3.1a). A large area of HGV parking was provided and a flexible and legible route around site was created. The footprint of the building changed as the brief was developed through comments from the client and technology providers.

3.3.22 Option 5 (Figure 3.1f) included the integration of offices, to increase health and safety for members of the public and staff by minimising the pedestrian and vehicle cross over.

3.3.23 The discovery of great crested newts within the ponds to the north of the site during the EIA process and the subsequent need to provide appropriate stand-offs between those ponds and the built development (in order to minimise the potential for effects and provide for sufficient space for ecological enhancement) resulted in a decrease in the site area available for development. This dictated the requirement for a more efficient layout to be created and this was achieved by integrating the tipping hall into the bunker and waste transfer facility. Extensive vehicle tracking was completed to minimise the footprint of this area whilst ensuring the one way system was maintained.

3.3.24 The design selected for the December 2016 submission scheme was derived following a further refinement to the layout, which provided for visitor and staff parking closer to the offices, especially for cyclists and disabled bay users and a more detailed analysis of the process equipment.

3.3.25 An image of the design at the time of the 2016 application is provided in Figure 3.1h.

Design Process Since the 2016 Application

3.3.26 Following submission of the 2016 application, feedback on the design was received from West Sussex County Council and its consultees. The design has been amended to respond to the feedback, with amendments to three key aspects, as described below:

- Height of built structures;
- Roof design; and
- Colour options.

Height

3.3.27 Throughout the design process, a key aim was to minimise the height of the building through:

- Lowering the ground level as much as possible, whilst maintaining the functional operation and sustainable characteristics of the facility; and
- Lowering the roof height of the tallest elements of the facility to the minimum requirement of the technology providers. This resulted in a stepped roof design for the boiler hall.

3.3.28 The maximum height of the building was defined by the height of the boiler drum, with an allowance for a crane rail and gib. The height of the boiler drum was in turn set by the pathway the flue gas needs to travel to meet two criteria:

- The requirement by the Industrial Emissions Directive for the flue gas to be at a temperature above of 850 ºC for more than 2 seconds from the last injection of oxygen (air); and
- The heat transfer surface of the boiler required to achieve the transfer of the heat from the flue gas to the water/steam in the boiler and superheater tubes to achieve the required steam temperature.

3.3.29 The current design is much lower in height than the previous design options considered (by almost 13 metres for the main building compared to the December 2016 application). This has been achieved through space efficiency in terms of the internal process technology and through sinking the design into the ground.

Roof Design

3.3.30 The design solutions considered consisted of two new distinct options. These were a curved roof solution, known as the 'curvilinear' option, and a rectangular solution. known as the 'rectilinear' option. Both the curvilinear and rectilinear options had the benefit over previous proposed design schemes of significantly reduced external height (as set out above).

3.3.31 The curvilinear solution incorporates a large sweeping curve across the facility. The purpose of the curve is to visually bring all of the separate elements of the facility together and to visually reduce the building's height. The reduction in building height is also helped by allowing the higher elements of the facility to protrude through the curve rather than taking the roof above all elements. This would have generated additional unnecessary volume and accentuated external visual mass.

3.3.32 The rectilinear solution was considered as an alternative approach to the facility design. This option kept the building form as a simple reflection of the necessary required internal process elements. Rather than using a sweeping curve to harmonise all of the different elements together, the use of colour and materials was intended to visually declutter and rationalise the design as one coherent entity.

3.3.33 For both options the flue gas treatment elements and silos would be housed within mesh screens to rationalise their visual appearance.

3.3.34 Both design options were presented at a public exhibition. The curvilinear option was favoured by the majority of residents as they considered that this would lessen the visual impact of the building.

Colour

3.3.35 The design process further considered visual effects through the placement of colour and the proposed façade treatment.

3.3.36 Great care has been taken to follow "Guidance on the selection and use of colour in development" (High Weald Area of Outstanding Beauty Partnership, 2017). It is aimed at integrating new buildings into the landscape in a way that benefits both the landscape and the built form. This can range from effectively camouflaging or minimizing the visual appearance of a utilitarian building to emphasizing the specific qualities of a place through the architecture, expressed in colour, form and massing. Good colour choices depend upon a good understanding of the proposed development in relation to its landscape setting.

3.3.37 The final colours chosen for the elevational treatment of the design reflect the darker, autumnal nature of the High Weald colour palette, and the desire to minimise the visual impact of the proposed facility within the landscape.

Summary

3.3.38 The design of the facility was achieved following a number of iterations. The design for the application was selected as the preferred option as it provided both the most operationally efficient design for the site and also the most beneficial in environmental terms. Grouping the buildings together and lowering the facility into the ground assisted in reducing the visual effect of the facility, making the most efficient use of the land.

3.3.39 Key design outcomes included:

- Economic, with the capability of the facility being used innovatively;
- Sustainable materials and design;
- Design that enables speed of installation/ construction;
- Self-cleaning surfaces to reduce frequency of maintenance to high risk areas;
- High acoustic, fire, vibration, odour, movement mitigation;
- Adhering to strict building insurance requirements;
- Complex and strict access and security control requirements;
- Complex vehicular logistic and movement strategy;
- Health and safety considerations; and
- Accommodating a 3Rs Facility with a capacity of 230,000 tonnes per annum incorporating a thermal treatment plant with a capacity to recover energy from 180,000 tonnes of residual waste in a single line.

Summary and Conclusions

3.3.40 The applicant considered a number of different technology options before deciding on the final scheme to take forward.

3.3.41 Mechanical pre-treatment followed by thermal treatment was assessed to be the best technology choice primarily based on technical performance, reliability, and environmental performance including emissions. Gasification was felt to be a possible thermal treatment option, but it was dismissed primarily due to its significantly smaller operational experience base. Pyrolysis does not currently demonstrate any environmental benefit and has a significantly weaker business case.

3.3.42 In view of the type of material to be treated at the site, alternative treatment technologies, such as composting, anaerobic digestant or mechanical biological treatment (with either of the latter processes) were not considered to be a viable option.

3.3.43 Mechanical pre-treatment and energy recovery using modern, state of the art technology is flexible and robust and was consequently selected as the technology proposed for the proposed 3Rs Facility. The facility would achieve "Recovery" status in accordance with the Waste Framework Directive and provide an alternative to landfill in addition to much needed renewable energy.

3.3.44 The design of the buildings and the site layout has evolved throughout the design development process and has been influenced and shaped by technical and environmental impact considerations as well as stakeholder consultation.

3.3.45 The final design has been selected as the preferred option as it provides both the most operationally efficient design for the site and is also the most beneficial in environmental terms. Grouping the buildings together and lowering the development into the ground has assisted in reducing the visual impact of the development, together with the use of an amended curvilinear roof design and suitable colour palette.

3.4 References

Publications

Biffa (2017) The Reality Gap (2017) (https://www.biffa.co.uk/wp-content/uploads/2015/11/048944_BIFFA_Reality-Gap_2017Single-150817-2.pdf).

Defra (2018) UK Statistics on Waste. 22 February 2018

High Weald AONB (2017) High Weald Area of Outstanding Natural Beauty Guidance on the Selection and Use of Colour.

Suez Environment (2017) Mind the Gap (www. http://www.sita.co.uk/wp-content/uploads/2017/09/MindTheGap20172030-1709-web.pdf).

Environmental Services Association (2017) "UK Residual Waste: 2030 Market Review" http://www.esauk.org/esa_reports/UK_Residual_Waste_Capacity_Gap_Analysis.pdf