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Consulting Engineers Limited

Tilbury IBA Facility

Blue Phoenix Limited

EP Application Supporting Information

ENGINEERING CONSULTING

Document approval

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Non-Technical Summary

Blue Phoenix Limited (Blue Phoenix) operates an IBA Facility (the Facility) at the Port of Tilbury in Tilbury, Essex. An Environmental Permit (EP) for the operation of the Facility was originally granted on 25 June 2012 (ref: EPR/BB3239RD). Subsequently, there have been four variations to the EP.

Within this application, Blue Phoenix is applying for a variation to the EP to allow for an increase in capacity of the Facility from 180,000 tonnes per annum to 400,000 tonnes per annum of waste. The additional capacity will enable the Facility to process the IBA generated by Cory's Riverside Energy Park, which is currently under construction and expected to commence operations in 2025.

In addition, to facilitate the increase in capacity, Blue Phoenix is also proposing the following changes to the Facility:

- The installation of new/additional IBA processing equipment within an existing shed adjacent to the current site (Shed 3). The existing IBA processing building would maintain operations until the point at which the new processing equipment has been commissioned, at which point the existing building will be demolished.
- Extending the installation boundary to incorporate additional land to allow for the additional processing capacity and associated storage areas.
- Installation of 2 new attenuation lagoons to contain run-off.

The environmental impact of these changes have been assessed within the application, and it has been concluded that they will result in any significant environmental impacts.

Due to the proposed increase in capacity, Blue Phoenix understands that the application should be determined as a Substantial Variation.

Contents

1 Introduction

Blue Phoenix Limited (Blue Phoenix) operates an IBA processing facility (the Facility) at the Port of Tilbury, Essex. An Environmental Permit (EP) for the operation of the Facility was originally granted by the Environment Agency (EA) on 25 June 2012. Since the EP was granted, there have been four variations granted by the EA.

Blue Phoenix is applying for a variation to the EP to increase the capacity of the Facility from 180,000 tonnes per annum to 400,000 tonnes per annum of waste. The additional capacity will enable the Facility to process the IBA generated by Cory's Riverside Energy Park, which is currently under construction and expected to commence operations in 2025.

Section 1 of this document provides a brief overview of the application, including the proposed changes and type of variation. Section 2 describes the proposed arrangements for the processing of IBA in further detail. Section 3 considers the environmental impacts associated with the operation of the Facility. Section 4 considers whether the proposals represent BAT, and assesses compliance with relevant legislative requirements. Section 5 considers the changes to the installation boundary. Section 6 provides a summary of the management system associated with the operation of the Facility.

1.1 Proposed changes

Within this application, Blue Phoenix is applying for the following changes to the EP:

- Increase the capacity of the Facility from the permitted 180,000 tonnes per annum to 400,000 tpa to serve Cory's Riverside Energy Park EfW facility, which is currently under construction.
- The installation of new/additional IBA processing equipment within an existing shed adjacent to the current site (Shed 3). The existing IBA processing building would maintain operations until the point at which the new processing equipment has been commissioned, at which point the existing building will be demolished.
- Extending the installation boundary to incorporate additional land to allow for the additional processing capacity and associated storage areas.
- Installation of 2 new attenuation lagoons to contain run-off.

1.2 Type of variation

The Environment Agency's guidance on Charging Schemes states that there are four types of variations – administrative, minor technical, normal and substantial.

Blue Phoenix acknowledges that the proposed changes will not constitute either an administrative or minor technical variation.

The Environment Agency has published guidance (Regulatory Guidance Note 8 – Substantial Change) which defines a substantial change. It is acknowledged that the guidance has subsequently been withdrawn but any replacement guidance is not as prescriptive. The guidance defined a substantial change as:

> *'… a change in operation of installations or mining waste facilities, which in our opinion may have significant negative effects on human beings or the environment. Certain changes are automatically regarded as substantial, namely:*
>
> > *a. a change in operation of a Part A installation which in itself meets the thresholds, if any, set out in Part 2 of Schedule 1 EPRs; or*

b. a change in operation of an incineration or co-incineration plant for non-hazardous waste which would involve the incineration or co-incineration of hazardous waste.'

The proposed increase in capacity is approximately 465 tonnes per day, assuming operation for 365 days per annum. The threshold for a regulated activity (S5.4 A(1)(b)(iii)) is 75 tonnes per day. On this basis, the proposed increase in processing capacity is more than the threshold for a Patr A installation as set out in Part 2 of Schedule 1 EPRs. Therefore, Blue Phoenix understands that the application should be determined as a Substantial Variation.

2 IBA Processing

2.1 Overview

The Facility will consist of a number of components:

- IBA processing building;
- oversize storage and processing area;
- unprocessed IBA stockpile area;
- IBAA storage stockpile areas (for different grades of IBAA);
- metal storage stockpile area.

2.2 IBA deliveries to the Facility

All materials transferred into and out of the Facility are delivered by road within enclosed or covered vehicles to reduce dust emissions. As part of the facility's pre-acceptance procedures, Cory is required to dampen down the material at the EfW Facility prior to loading for dispatch to the Facility.

All IBA delivered to the Facility is subject to the requirements of the Blue Phoenix's existing waste pre-acceptance and waste acceptance procedures. The arrangements for the pre-acceptance and acceptance of waste will not change from the proposed extension to the Facility.

In addition, as per the current arrangements, virgin aggregate will be imported via barge to the port of Tilbury and transferred to the Facility for blending with the IBA to produce IBAA products.

A record shall be kept of the types and quantities of waste delivered and removed from the Facility. These records are kept in the Site Office and available for inspection by Environment Agency officers. These records are kept secure from loss, damage or deterioration. Records are kept for a minimum of 6 years. The records of waste accepted and removed from site will include the following information:

- Time and date received or removed from site.
- Vehicle registration and waste carrier details.
- Producer's name and address, SIC Code, and Waste Hierarchy declaration.
- Description of the waste by EWC category and quantity in tonnes.
- Details of the onward site for wastes removed from site.

A speed limit of 11mph is enforced on site.

Site vehicles will be regularly cleaned during dry months. This can also reduce dust emissions in dry conditions.

2.3 IBA Reception

If the IBA is tipped and found to be unusually dusty (IBA is delivered with a moisture content that typically prevents dust from being generated), it will be dampened down to prevent dust being generated. If these measures are not sufficient, then the tipping and processing of the material will be temporarily halted until conditions improve.

Once tipped, the IBA will be stored in stockpiles for a period of up to four weeks prior to processing to:

1. reduce the water content of the IBA, as the material is allowed to dewater; and
2. allow the material time to undergo several naturally occurring chemical reactions. These reactions, including carbonisation and hydration, reducing its pH and thereby improves the material prior to processing.

The storage area for IBA delivered to the Facility will have a storage capacity of approximately up to 240,000 tonnes.

2.4 IBA Processing

IBA will be moved by a loading shovel from the IBA storage area to a hopper at the IBA Processing Building.

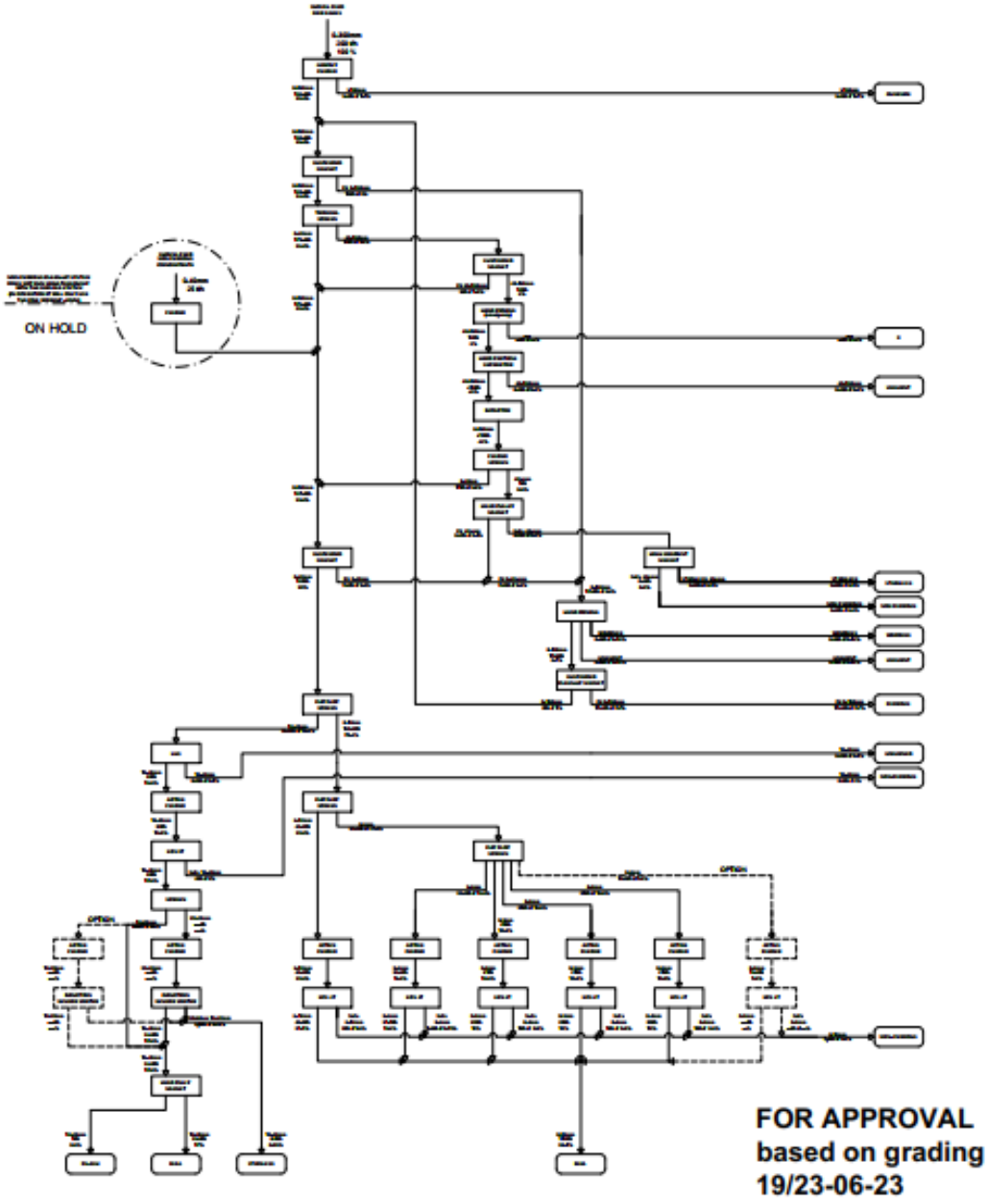
Within the processing building, the IBA is processed through vibrating screens and magnetic metal separation which removes the ferrous and non-ferrous metals and produces different sized fractions of Incinerator Bottom Ash Aggregate (IBAA). In addition, virgin aggregate will be blended into the IBA to produce IBAA products.

The process screens, separates and sizes the IBA and extracts the non-ferrous and ferrous metals. The processed material is split into various product sizes, before being stored in stockpiles as IBAA in dedicated external stockpiles for onward delivery. Whilst the IBAA is being stored it will continue to be weathered by the air and rainwater.

The quantities of IBAA being stored on site will be influenced by the market demand for IBAA material. Typically, the lowest demand occurs during the winter months and the highest during the summer months.

An indicative process schematic for IBA processing is provided is provided in Figure 1, with a larger version being provided in Appendix A.

Figure 1: Indicative IBA processing schematic



The estimated storage capacities for the output materials recovered within the Facility is provided in Table 1.

Table 1: Storage capacities for materials recovered

Material Recovered	Estimated storage capacity (tonnes)
Fines aggregate	100,000
Coarse aggregate	40,000
Ferrous metals	2000
Non-ferrous metals	500

2.5 Water management

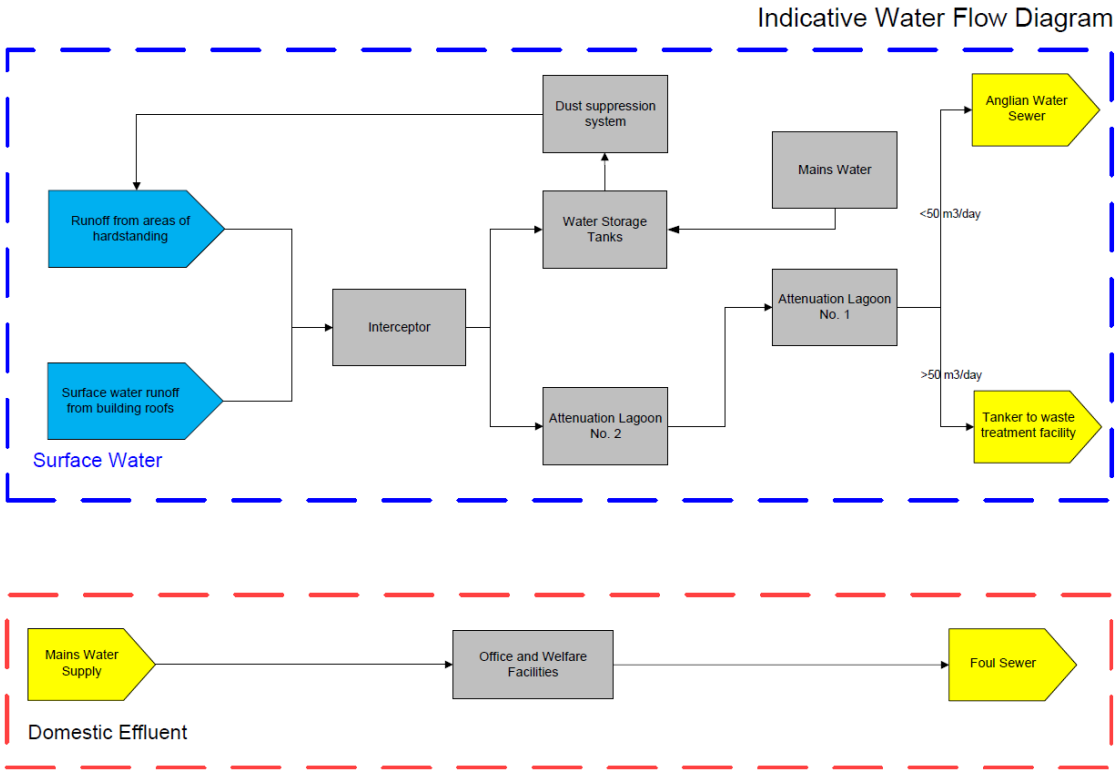
The existing surface water management arrangements for the existing land within the installation boundary will be retained, and will continue to manage run-off from these areas. Excess run-off from the existing facility is discharged to sewer in accordance with an existing Trade Effluent Consent granted by Thames Water.

The Facility will utilise water for dust suppression, as discussed in section 2.6. To minimise the consumption of mains water, the Facility currently collects surface water run-off from all areas of the additional hardstanding within the on-site attenuation lagoon. This same approach will be adopted for the additional area of land to be included within the installation boundary, with hardstanding being designed to direct run-off from this area into a new (additional) attenuation lagoon (attenuation lagoon No.2) which will be installed in this area. The attenuation lagoons will be designed as a water retaining structure. Excess surface water run-off which cannot be re-used within the Facility will be discharged to sewer in accordance with the existing Trade Effluent Consent.

To provide additional containment capacity for surface water run-off, and control the flow of surface water run-off from to sewer, there will be three water storage tanks, along with attenuation lagoon No.2, which will be utilised to contain and store run-off from the Facility prior to discharge to sewer. Excess water which is collected in the water storage tanks and attenuation lagoon No.2 will overflow into the existing attenuation lagoon (attenuation lagoon No.1), which subsequently discharges to sewer.

An indicative water flow schematic is provided in Figure 2, with a larger version being provided in Appendix A.

Figure 2: Indicative water flow schematic



2.6 Dust management

The Facility has been designed to reduce fugitive emissions, including the following measures:

- Material stored in the external storage bays is dampened prior to movement/handling in dry, dusty conditions.
- The processing equipment is housed within a dedicated enclosed processing building.
- The outdoor surface will be regularly cleaned.
- Weather conditions are checked prior to undertaking activities with a potential for dust release.
- The site has an impermeable surface (concrete) with a fully contained drainage system.
- A dust suppression system is installed on site with surface water run-off harvested from all areas of hardstanding being collected in attenuation lagoons; water storage tanks; and mains water when these primary sources have been fully utilised.

A detailed Dust Management Plan for the Facility is provided in Appendix B.

2.6.1 Rain guns/water cannons

Rain guns/water cannons will be strategically located around the IBA and IBAA storage areas to provide dust suppression. The rain guns/water cannons are a comprehensive system of spray nozzles covering all loading, unloading and storage areas. Each rain gun/water cannon will spray water to a radius of 30m. A site layout plan showing the indicative locations of the rain guns/water cannons is provided in Appendix A. The location of the rain guns will ensure an arc coverage of all IBA and IBAA storage areas/stockpiles.

2.6.2 Plant and equipment

Processing equipment includes screens, conveyor systems, vibrating screens, trommel, crushers, magnetic separators and eddy current separators. The loading equipment includes a loading shovel and a 360 excavator, and a forklift truck is also used on site for movement of containers.

The equipment is maintained and serviced in accordance with a preventative maintenance programme, as outlined by the manufacturer's specifications.

If any process equipment is required to be replaced, Blue Phoenix will select replacement equipment with the lowest emissions standard possible at the time of replacement.

2.6.3 Sweeping and dampening down systems

Blue Phoenix can confirm the following:

1. The mobile plant will not be used on the public highway.
2. Araes of hardstanding/roadways will be cleaned with a road sweeper on a periodic basis – this will be undertaken more frequently during dry periods.
3. Daily inspections are undertaken as part of the daily checks and the plant and machinery are cleaned to remove residual dusts in response to the daily inspections; the Operator cleans the plant and machinery on a daily basis, which can be increased to weekly if there is no requirement for daily cleaning. The cleaning is in response to the operations and the daily checks.
4. The shovel is used to clear dust off the site surface when required.
5. Areas where dust is likely to build up are frequently cleaned, typically on a daily basis.

6. The Operator has access equipment and onsite spill kits to clean up after spillages of waste material on site.

3 Environment Assessments

An Environmental Risk Assessment has been developed to identify the control systems associated with minimising the impact of the Facility in relation to the following:

1. noise;
2. fugitive emissions; and
3. accidents.

The Environmental Risk Assessment has been developed to consider the requirements of Environment Agency Guidance Notes H1 Annexes A, C, H and F. It is acknowledged that these guidance documents have been withdrawn; however, it is understood that the requirements of the guidance are still applicable.

Full details of the Environmental Risk Assessment can be found in Appendix D and the environmental impacts in relation to the following have been summarised in sections 3.1 to 3.5:

- emissions to air;
- emissions to water and sewer;
- noise;
- odour; and
- fire prevention.

3.1 Emissions to air

There will not be any point source emissions to air from the Facility.

The following activities have been identified as potential sources of dust and particulate emissions during the operation of the Facility:

- on-loading and off-loading incoming and outgoing materials from river vessels to site vehicles and mobile plant; and
- potential for particulates from exhausts and from vessels importing and exporting material to and from the Facility.

All deliveries will be within enclosed vehicles. The IBA is also when wet when it is transferred into the containers. Since it is not ‘dry’ material, it will not give rise to dust emissions when unloaded.

Processing of IBA is undertaken within an enclosed building, to prevent and mitigate emissions of dusts. Blue Phoenix acknowledges that the storage and handling of IBA, if not appropriately managed, can result in fugitive dust emissions. Therefore, Blue Phoenix proposes to extend its existing arrangement for dust management and mitigation to minimise the off-site impacts of dust from the Facility.

Whilst the Facility is subject to detailed design, a Dust Management Plan to cover the proposed operations is provided in Appendix B.

3.2 Emissions to water and sewer

There are no emissions to water from the Facility.

All surface water run-off is collected within the site drainage systems, including the attenuation pond and water storage tanks, and are re-used within the process to dampen the IBA and minimise the generation of fugitive dust emissions.

Excess effluents are either discharged to sewer in accordance with a Trade Effluent Consent granted by Anglian Water or are transported off-site via road tanker to a suitably licensed waste management facility. Following implementation of the proposed variation, the arrangements for the excess effluents will remain with the discharges to sewer being in accordance with the existing arrangements.

On this basis, there will not be any changes to the emissions to water or sewer associated with the proposed variation.

3.3 Noise

A Noise Assessment has been developed to understand the noise impacts associated with the proposed extension to the Facility. Refer to Appendix C.

As set out within the noise assessment, allowing for the unloading of IBA within the Port of Tilbury and the transfer to the Facility (these are both existing operations, which will not be changing from the proposed variation) and the expansion of the Facility, the proposed variation will result in a 'low noise impact' in accordance with the noise assessment criteria set out in BS4142.

On this basis, it is understood that a Noise Management Plan is not required to support this application. Furthermore, it is worth noting that the existing EP does not require Blue Phoenix to implement a Noise Management Plan at the existing facility.

3.4 Odour

IBA is generated from the combustion of waste. Due to the high temperatures at which it is combusted, any organic materials which is within the waste is destroyed. On this basis, it is understood that IBA is not inherently odorous, and Blue Phoenix does not propose to implement an Odour Management Plan for the Facility. Furthermore, the EP for the existing facility does not require the implementation of an odour management plan.

3.5 Fire Prevention

In accordance with the Environment Agency titled '*Fire prevention plans: environmental permits*', a Fire Prevention Plan is required for all waste treatment facilities which accept any amount of combustible waste. Whilst the Facility will process wastes, the wastes which it processes is the non-combustible residue generated by waste incineration plants.

On this basis, it is understood that a Fire Prevention Plan is not required to support this application. Furthermore, it is worth noting that the existing EP does not require Blue Phoenix to implement a Fire Prevention Plan at the existing facility.

4 BAT assessment

4.1 Treatment techniques

There are three potential treatment techniques for IBA:

- Wet Treatment (washing);
- Thermal Treatment (vitrification); and
- Dry Treatment (air maturation).

Wet treatment systems use water to wash soluble salts from the IBA. Wet treatment systems produce large quantities of effluent which require treatment either on-site or offsite and subsequent discharge to water/sewer. There is no on-site water treatment facility ; therefore, any effluent would require transport off-site to a suitably licensed recovery/disposal facility. Due to the large quantities of effluent produced by wet system these are not considered appropriate for the Facility.

Thermal treatment systems have high destruction efficiency of organics and immobilization of environmental harmful elements. However, the high temperature processing required for vitrification of the IBA has a very high energy cost. Bottom ash from the incineration of MSW is a very inhomogeneous product and the results of vitrification have been known to vary. Therefore, the slag received at the Facility can differ in composition and the subsequent level of immobilization of pollutants can vary. Due to the high energy costs and the potential for varying levels of immobilization of pollutants from the IBA, thermal treatment systems are not considered appropriate for the Facility.

The dry treatment of IBA uses small quantities of water and produces comparatively small quantities of effluent. The effluent can re-used on site, and when there is excess effluent this can be transported off-site to a suitably licensed recovery/disposal facility. The volume of effluent produced in a dry treatment system will be significantly smaller than a wet treatment system. The equipment used on dry treatment systems use significantly smaller quantities of power when compared to thermal treatment systems. Due to the small quantities of effluent and low power consumption associated with dry systems, they are considered to represent BAT.

In addition, there are no IBA treatment facilities in the UK which employ either wet treatment or thermal treatment techniques, so Blue Phoenix does not consider these techniques to be a proven technology. Blue Phoenix currently operates a number of facilities in the UK which employ the use of dry treatment systems, including the existing facility.

Taking into consideration the above, Blue Phoenix considers that dry treatment of IBA through air maturation represents BAT for the treatment of IBA.

4.2 The Legislative Framework

4.2.1 Requirements of the Waste Treatment Industries BREF

The Waste Treatment Industries (WT) BREF BAT conclusions were published by the European IPPC Bureau in December 2019. All waste treatment facilities are required to demonstrate that they meet the requirements of the BREF. The table below identifies the requirements of the Best Available Techniques (BAT) conclusions as set out in the WT BREF and explains how the Facility will comply with them.

Table 2:Summary table for Waste Treatment Industries BAT conclusions compliance

#	BAT Requirement	How met or reference
1	In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the features as set out in the BREF. The scope (e.g. level of detail) and nature of the EMS (e.g. standardised or non-standardised) will generally be related to the nature, scale and complexity of the installation, and the range of environmental impacts it may have (determined also by the type and amount of wastes processed).	The existing facility is operated in accordance with a documented environmental management system (EMS) which has been accredited to ISO:14001, refer to Appendix F. Blue Phoenix proposes to extend the existing EMS to incorporate the operation of the extent of the entire Facility.
2	In order to improve the overall environmental performance of the plant, BAT is to use all of the techniques set out in the BREF.	The existing facility is operated in accordance with fully documented waste pre-acceptance and waste acceptance procedures. Blue Phoenix will extend the existing waste pre-acceptance and waste acceptance procedures to cover the operation of the extent of the entire Facility.
3	In order to facilitate the reduction of emissions to water and air, BAT is to establish and to maintain an inventory of wastewater and waste gas streams, as part of the environmental management system (see BAT 1), that incorporates all of the features set out in the BREF.	As part of the existing EMS, Blue Phoenix maintains an inventory of the wastewater streams generated at the existing Facility. Blue Phoenix will extend this to incorporate the operation of the entire Facility.

#	BAT Requirement	How met or reference
4	In order to reduce the environmental risk associated with the storage of waste, BAT is to use all of the techniques set out in the BREF.	Blue Phoenix has developed the expansion of the Facility to take into consideration the techniques provided in BAT4.
5	In order to reduce the environmental risk associated with the handling and transfer of waste, BAT is to set up and implement handling and transfer procedures.	As part of the existing EMS, Blue Phoenix maintains an inventory of the wastewater streams generated at the existing Facility. Blue Phoenix will extend this to incorporate the operation of the entire Facility.
6	For relevant emissions to water as identified by the inventory of waste water streams (see BAT 3), BAT is to monitor key process parameters (e.g. waste water flow, pH, temperature, conductivity, BOD) at key locations (e.g. at the inlet and/or outlet of the pre-treatment, at the inlet to the final treatment, at the point where the emission leaves the installation).	There are no discharges to water from the Facility. Therefore, this BATc is not applicable to the Facility.
7	BAT is to monitor emissions to water with at least the frequency given below, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.	There are no discharges to water from the Facility. Therefore, this BATc is not applicable to the Facility.
8	BAT is to monitor channelled emissions to air with at least the frequency given below, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.	There are no channelled emissions to air from the Facility. Therefore, this BATc is not applicable to the Facility.
9	BAT is to monitor diffuse emissions of organic compounds to air from the regeneration of spent solvents, the decontamination of equipment containing POPs with solvents, and the physico-chemical treatment of solvents for the recovery of their calorific value, at least once per year using one or a combination of the techniques set out in the BREF.	There are no diffuse emissions of organic compounds to air from the Facility. Therefore, this BATc is not applicable to the Facility.

#	BAT Requirement	How met or reference
10	BAT is to periodically monitor odour emissions.	The storage and processing of IBA does not give rise to odour. Therefore, this BATc is not applicable to the Facility.
11	BAT is to monitor the annual consumption of water, energy and raw materials as well as the annual generation of residues and wastewater, with a frequency of at least once per year.	As part of the existing EMS, Blue Phoenix monitors the annual consumption of water, energy and raw material consumption, as well as the annual generation of residues ad effluents. Blue Phoenix will extend this to incorporate the operation of the entire Facility.
12	In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements: — a protocol containing actions and timelines; — a protocol for conducting odour monitoring as set out in BAT 10; — a protocol for response to identified odour incidents, e.g. complaints; and — an odour prevention and reduction programme designed to identify the source(s); to characterise the contributions of the sources; and to implement prevention and/or reduction measures. The applicability is restricted to cases where an odour nuisance at sensitive receptors is expected and/or has been substantiated.	The storage and processing of IBA does not give rise to odour. Therefore, this BATc is not applicable to the Facility.
13	In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to use one or a combination of the techniques set out in the BREF.	The storage and processing of IBA does not give rise to odour. Therefore, this BATc is not applicable to the Facility.
14	In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour, BAT is to use an appropriate combination of the techniques set out in the BREF. Depending on the risk posed by the waste in terms of diffuse emissions to air, BAT 14d is especially relevant.	The Facility will be operated in accordance with a Dust Management Plan which sets out the measures to mitigate emission of dust (see Appendix B). As set out within the Dust Management Plan, the measures include for the dampening of the stockpiles of IBA/IBAA to minimise the fugitive emissions from the Facility.

#	BAT Requirement	How met or reference
15	BAT is to use flaring only for safety reasons or for non-routine operating conditions (e.g. start-ups, shutdowns) by using both of the techniques set out in the BREF.	There will not be any flaring of gases from the Facility. Therefore, this BATc is not applicable to the Facility.
16	In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use both of the techniques set out in the BREF.	There will not be any flaring of gases from the Facility. Therefore, this BATc is not applicable to the Facility.
17	In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to set up, implement and regularly review a noise and vibration management plan, as part of the environmental management system (see BAT 1), that includes all of the elements set out in the BREF.	As part of the existing EMS, Blue Phoenix undertakes periodic monitoring of noise from the existing facility. Blue Phoenix will extend this to incorporate the operation of the entire Facility.
18	In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to use one or a combination of the techniques set out in the BREF.	In accordance with the requirements of BAT 18, it can be confirmed that the following techniques will be employed at the site to prevent or reduce noise emissions: • Appropriate location of equipment and buildings – in accordance with normal industry practice, the layout of the Facility has been designed to implement an efficient layout to result in acceptable operational noise levels. • Operational measures – regular inspection and maintenance of equipment will be undertaken. Doors to IBA processing buildings will remain closed as far as is reasonably practicable. • Low-noise equipment – the process equipment to be specified within the Facility be based on the optimal plant selection, where appropriate, to reduce the noise level. • Noise attenuation – where appropriate, IBA processing buildings will have been designed for limiting noise emissions to acceptable levels for compliance with relevant workplace regulations.

#	BAT Requirement	How met or reference
		• Noise-control equipment/infrastructure – where appropriate, cladding will be used on IBA processing areas. Refer to the Noise Assessment presented in Appendix C for further details on noise mitigation measures proposed for the site.
19	In order to optimise water consumption, to reduce the volume of wastewater generated and to prevent or, where that is not practicable, to reduce emissions to soil and water, BAT is to use an appropriate combination of the techniques set out in the BREF.	In accordance with the requirements of BAT 19, it can be confirmed that the following techniques will be employed at the site to optimise water consumption; reduce the volume of wastewater generated; and reduce emission to soil and water: • Water management – use of harvested rainwater for dust suppression and maturation purposes • Water recirculation – surface water run-off will be collected in the attenuation lagoons for re-use within the Facility • Impermeable surface – the Facility will be covered within an impermeable hardstanding to prevent contamination of the underlying ground from leachate running off from IBA/IBAA stockpiles.
20	In order to reduce emissions to water, BAT is to treat wastewater using an appropriate combination of the techniques set out in the BREF.	There are no discharges to water from the Facility. Therefore, this BATc is not applicable to the Facility.
21	In order to prevent or limit the environmental consequences of accidents and incidents, BAT is to use all of the techniques set out in the BREF, as part of the accident management plan (see BAT 1).	As part of the existing EMS, Blue Phoenix has developed a documented accident management plan. Blue Phoenix will extend this to incorporate the operation of the entire Facility.
22	In order to use materials efficiently, BAT is to substitute materials with waste.	The Facility processes IBA to generate a produce a secondary aggregate (IBAA) which can be used in construction.
23	In order to use energy efficiently, BAT is to use both of the techniques (energy efficiency plan and energy balance record) set out in the BREF.	As part of the existing EMS, Blue Phoenix monitors the annual energy consumption, and has developed an energy efficiency plan to reduce the consumption of energy within the facility.

#	BAT Requirement	How met or reference
		Blue Phoenix will extend this to incorporate the operation of the entire Facility.
24	In order to reduce the quantity of waste sent for disposal, BAT is to maximise the reuse of packaging, as part of the residues management plan (see BAT 1).	IBA will be delivered to the Facility in ISO containers, which are subsequently returned to the IBA producer for re-use.
25	In order to reduce emissions to air of dust, and of particulate-bound metals, PCDD/F and dioxin-like PCBs, BAT is to apply BAT 14d and to use one or a combination of the techniques given in the BREF.	The Facility will be operated in accordance with a Dust Management Plan which sets out the measures to mitigate emission of dust (see Appendix B). As set out within the Dust Management Plan, the measures include for the dampening of the stockpiles of IBA/IBAA to minimise the fugitive emissions from the Facility.
26	In order to improve the overall environmental performance, and to prevent emissions due to accidents and incidents, BAT is to use BAT 14g and all of the techniques set out in the BREF.	The Facility will not be shredding metal waste. Therefore, this BATc is not applicable to the Facility.
27	In order to prevent deflagrations and to reduce emissions when deflagrations occur, BAT is to use the techniques set out in the BREF.	The Facility will not be shredding metal waste. Therefore, this BATc is not applicable to the Facility.
28	In order to use energy efficiently, BAT is to keep the shredder feed stable.	The Facility will not be shredding metal waste. Therefore, this BATc is not applicable to the Facility.
29	In order to prevent or, where that is not practicable, to reduce emissions of organic compounds to air, BAT is to apply BAT 14d, BAT 14h and to use technique a. and one or both of the techniques b. and c. given below.	The Facility will not be treating WEEE. Therefore, this BATc is not applicable to the Facility.
30	In order to prevent emissions due to explosions when treating WEEE containing VFCs and/or VHCs, BAT is to use either of the techniques set out in the BREF.	The Facility will not be treating WEEE. Therefore, this BATc is not applicable to the Facility.
31	In order to reduce emissions to air of organic compounds, BAT is to apply BAT 14d and to use one or a combination of the techniques set out in the BREF.	The Facility will not be treating waste with calorific value. Therefore, this BATc is not applicable to the Facility.

#	BAT Requirement	How met or reference
32	In order to reduce mercury emissions to air, BAT is to collect mercury emissions at source, to send them to abatement and to carry out adequate monitoring.	The Facility will not be treating WEEE containing mercury. Therefore, this BATc is not applicable to the Facility.
33	In order to reduce odour emissions and to improve the overall environmental performance, BAT is to select the waste input.	The Facility will not include biological treatment processes. Therefore, this BATc is not applicable to the Facility.
34	In order to reduce channelled emissions to air of dust, organic compounds and odorous compounds, including H2S and NH3, BAT is to use one or a combination of the techniques set out in the BREF.	The Facility will not include biological treatment processes. Therefore, this BATc is not applicable to the Facility.
35	In order to reduce the generation of wastewater and to reduce water usage, BAT is to use all of the techniques set out in the BREF.	The Facility will not include biological treatment processes. Therefore, this BATc is not applicable to the Facility.
36	In order to reduce emissions to air and to improve the overall environmental performance, BAT is to monitor and/or control the key waste and process parameters.	The Facility will not include aerobic treatment processes. Therefore, this BATc is not applicable to the Facility.
37	In order to reduce diffuse emissions to air of dust, odour and bioaerosols from open-air treatment steps, BAT is to use one or both of the techniques given in the BREF.	The Facility will not include aerobic treatment processes. Therefore, this BATc is not applicable to the Facility.
38	In order to reduce emissions to air and to improve the overall environmental performance, BAT is to monitor and/or control the key waste and process parameters.	The Facility will not include anaerobic treatment processes. Therefore, this BATc is not applicable to the Facility.
39	In order to reduce emissions to air, BAT is to use both of the techniques given in the BREF.	The Facility will not include mechanical biological treatment processes. Therefore, this BATc is not applicable to the Facility.
40	In order to improve the overall environmental performance, BAT is to monitor the waste input as part of the waste pre-acceptance and acceptance procedures (see BAT 2).	The Facility will not include physico-chemical treatment processes. Therefore, this BATc is not applicable to the Facility.
41	In order to reduce emissions of dust, organic compounds and NH3 to air, BAT is to apply BAT 14d and to use one or a combination of the techniques given in the BREF.	The Facility will not include physico-chemical treatment processes. Therefore, this BATc is not applicable to the Facility.

#	BAT Requirement	How met or reference
42	In order to improve the overall environmental performance, BAT is to monitor the waste input as part of the waste pre-acceptance and acceptance procedures (see BAT 2).	The Facility will not receive, treat or process waste oil. Therefore, this BATc is not applicable to the Facility.
43	In order to reduce the quantity of waste sent for disposal, BAT is to use one or both of the techniques set out in the BREF.	The Facility will not receive, treat or process waste oil. Therefore, this BATc is not applicable to the Facility.
44	In order to reduce emissions of organic compounds to air, BAT is to apply BAT 14d and to use one or a combination of the techniques set out in the BREF.	The Facility will not receive, treat or process waste oil. Therefore, this BATc is not applicable to the Facility.
45	In order to reduce emissions of organic compounds to air, BAT is to apply BAT 14d and to use one or a combination of the techniques set out in the BREF.	The Facility will not physico-chemical treatment processes for waste with calorific value. Therefore, this BATc is not applicable to the Facility.
46	In order to improve the overall environmental performance of the regeneration of spent solvents, BAT is to use one or both of the techniques set out in the BREF.	The Facility will not receive, treat or process spent solvents. Therefore, this BATc is not applicable to the Facility.
47	In order to reduce emissions of organic compounds to air, BAT is to apply BAT 14d and to use a combination of the techniques set out in the BREF.	The Facility will not receive, treat or process spent solvents. Therefore, this BATc is not applicable to the Facility.
48	In order to improve the overall environmental performance of the thermal treatment of spent activated carbon, waste catalysts and excavated contaminated soil, BAT is to use all of the techniques set out in the BREF.	The Facility will not receive, treat or process spent activated carbon, waste catalysts and excavated contaminated soils. Therefore, this BATc is not applicable to the Facility.
49	In order to reduce emissions of HCl, HF, dust and organic compounds to air, BAT is to apply BAT 14d and to use one or a combination of the techniques set out in the BREF.	The Facility will not receive, treat or process spent activated carbon, waste catalysts and excavated contaminated soils. Therefore, this BATc is not applicable to the Facility.
50	In order to reduce emissions of dust and organic compounds to air from the storage, handling, and washing steps, BAT is to apply BAT 14d and to use one or a combination of the techniques set out in the BREF.	The Facility will not include water washing of excavated contaminated soil. Therefore, this BATc is not applicable to the Facility.

#	BAT Requirement	How met or reference
51	In order to improve the overall environmental performance and to reduce channeled emissions of PCBs and organic compounds to air, BAT is to use all of the techniques set out in the BREF.	The Facility will not include treatment process for the decontamination of equipment containing PCB. Therefore, this BATc is not applicable to the Facility.
52	In order to improve the overall environmental performance, BAT is to monitor the waste input as part of the waste pre-acceptance and acceptance procedures (see BAT 2).	The Facility will not include treatment of water-based liquid wastes. Therefore, this BATc is not applicable to the Facility.
53	In order to reduce emissions of HCl, NH3 and organic compounds to air, BAT is to apply BAT 14d and to use one or a combination of the techniques set out in the BREF.	The Facility will not include treatment of water-based liquid wastes. Therefore, this BATc is not applicable to the Facility.

4.2.2 Requirements of the Waste Incineration BREF

The Waste incineration (WI) BREF BAT conclusions were published by the European IPPC Bureau in December 2019. Waste incineration plants, and associated IBA treatment facilities are required to demonstrate that they meet the requirements of the BREF when applying for an EP. As such, Table 3 identifies the relevant requirements of the Best Available Techniques (BAT) conclusions as set out in the BREF and explains how the Facility will comply with them. It should be noted that Table 3 only includes the BAT conclusions which are applicable to the treatment of IBA and is not the full list of BAT Conclusions within the WI BREF.

Table 3:Summary table for WI BREF BAT conclusions compliance

#	BAT Conclusion	How met or reference
23	In order to prevent or reduce diffuse dust emissions to air from the treatment of slags and bottom ashes, BAT is to include in the EMS the diffuse dust emission management features as given in BAT 21 of the WI BREF	The Facility will be operated in accordance with a Dust Management Plan which sets out the measures to mitigate emission of dust (see Appendix B). As set out within the Dust Management Plan, the measures include for the dampening of the stockpiles of IBA/IBAA to minimise the fugitive emissions from the Facility.
24	In order to prevent or reduce diffuse dust emissions to air from the treatment of slags and bottom ashes, BAT is to use an appropriate combination of the techniques as given in BAT 24 of the WI BREF.	Blue Phoenix has incorporated the following techniques within the design and layout of the Facility:

#	BAT Conclusion	How met or reference
		• Enclose and cover equipment – all IBA processing will be undertaken within an enclosed IBA processing building. • Use of water sprays – Rain guns are located around the Site for dust suppression. It is a comprehensive system of spray nozzles and covers the loading, unloading and storage areas. The design and location of the rain guns has been determined to ensure an arc coverage of all IBA and IBAA storage areas/stockpiles.
26	In order to reduce channelled dust emissions to air from the enclosed treatment of slags and bottom ashes with extraction of air, BAT is to treat the extracted air with a bag filter.	There are no plans to install a dust extraction unit within the treatment system. Prior to transfer of the IBA to the Facility, the EfWs where the IBA is generated will quench the IBA in a water bath. It is then loaded onto lorries and delivered to site. While the IBA is onsite, it is monitored in accordance with the requirements of the dust management plan. If required, the dust suppression system dampens down the site and the material stockpiles.
34	In order to reduce emissions to water from FGC and/or from the storage and treatment of slags and bottom ashes, BAT is to use an appropriate combination of the techniques as listed in BAT 34 of the BREF, and to use secondary techniques as close as possible to the source in order to avoid dilution.	There are no emissions to water from the Facility. Therefore, this BATc is not applicable to the Facility.
35	In order to increase resource efficiency, BAT is to handle and treat bottom ashes separately from FGC residues.	The Facility will not receive RGC residues. Therefore, this BATc is not applicable to the Facility.
36	In order to increase resource efficiency for the treatment of slags and bottom ashes, BAT is to use an appropriate combination of the techniques as listed in BAT 36 of the BREF, based on a risk assessment depending on the hazardous properties of the slags and bottom ashes.	The Facility will implement all of the measures listed within BAT 34 to increase the resource efficiency from the treatment process.

5 Changes to the Installation Boundary

5.1 Installation boundary

Due to proposed increase in capacity of the Facility and the installation of new/additional IBA processing equipment within an existing shed adjacent to the current site (Shed 3) and the extension of additional storage areas of IBA and IBAA, it is proposed to extend the installation boundary to incorporate the additional land.

A drawing identifying the additional areas which will be incorporated into the installation boundary, as well the extent of the revised installation boundary is provided in Appendix A. An updated Site Condition Report to reflect the changes to the Installation Boundary is presented in Appendix E.

5.2 Emission points

It is noted that the installation boundary drawing presented in Schedule 7 of the EP does not identify the location of the emission points identified in Schedule 3 of the EP. For completeness, an emission point drawing is provided in Appendix A, identifying the location of emission point S1 – emission to sewer. This is not changing from the implementation of the proposed changes to the Facility.

6 Management Systems

Blue Phoenix is committed to managing and continually improving environmental performance and have an existing Environmental Management System (EMS) which covers all existing Site operations and change management.

Blue Phoenix's existing EMS include dedicated procedures which ensure that the environmental performance of the Site is maintained, monitored, recorded, and continuously developed, these include:

- Weekly Environmental Checks;
- Daily Environmental Checks;
- Monitoring and Measurement;
- Internal Audit;
- Internal Audit Schedule;
- External Audit;
- External Audit Schedule;
- Audit Responses;
- Production Site Documentation Requirements;
- Document Control Procedure; and
- Document & Data Retention.

During internal audits, the facility's performance will be assessed against relevant sector guidance and standards.

External audits are carried out to ensure continued compliance with relevant ISO Standard Accreditations.

The existing EMS has a number of procedures in place which when applied, facilitate the effective implementation of the facility's environmental performance procedures. These include procedures which focus on staff training and development, effective process control and emergency preparedness, all of which facilitate the Site to implement their environmental performance procedures. These dedicated sections of the EMS are as follows:

- Roles & Responsibilities;
- Technical Competence Policy;
- Production Site Documentation Requirements;
- Document Control Procedure;
- Document & Data Retention;
- Communication Procedure;
- Communication Record Sheet;
- Weekly Environmental Check;
- Daily Environmental Check;
- Management of Change Process;
- Emergency Preparedness; and
- Legal Matrix (Compliance Matrix).

Documentation is kept within the EMS which relate to the ongoing upkeep of environmental performance, including documentations pertaining to emissions from Site and individual environmental management plans, which include:

- Aspects & Impacts Procedure;
- Accident Management Plan;
- Aspects & Impacts Matrix/Accident Management Plan;
- Dust Management Plan (refer to Appendix B);
- Noise Management Plan;
- Site Condition Report;
- Attenuation lagoon monitoring and discharge to sewer; and
- Procedure for General Spillage.

Inspection and maintenance schedules for the Site are kept within the EMS within the Weekly Environmental Check and the Daily Environmental Check documentation.

All changes on Site, proposed for existing procedures or infrastructure, are approved through the Management of Change Process, as outlined within the existing EMS.

The EMS has management commitment and is approved by senior management for the wider company. Senior management review the EMS at least annually to ensure the contents of the EMS is sufficient, as well as review if any newer cleaner technologies can be incorporated to Site operations. This is demonstrated within the EMS documents Management Review Protocol and Management Review Document. Any amendments required to the EMS following a management review are done as soon as practically possible and recorded within the Amendments document within the EMS.

The existing EMS clearly sets out the physical capacity of the Facility, outlining the capacity of waste storage and handling areas. These sections of the EMS will be updated accordingly to allow the revised storage and handling capacities of the Facility following the implementation of the proposed changes.

The EMS will be updated accordingly to incorporate the modifications associated with expansion of the Site where necessary. BPL's EMS is certified to ISO 14001 standard. A copy of the Site's ISO 14001 certification can be found in Appendix F.

6.1 Staff Competence

Blue Phoenix has developed a Training Matrix that outline the skills and competencies necessary for key posts within their facilities. This was part of the accreditation process to the Competence Management System (CMS) that was completed during 2015. As such, all staff are appropriately and adequately trained in the position they hold within the facility. The Facility is operated at all times by an adequate number of staff to ensure safe operation of the Site.

The design, installation and construction of the expansion of the Site will be conducted by competent contractors under a Construction Quality Assurance scheme.

6.2 Accident Management Plan

There are no changes proposed to the manner in which accidents will be managed at the facility. Blue Phoenix has an existing EMS which covers all existing operations, including how accidents are

managed on Site. Blue Phoenix has implemented the following procedures at the existing facility, and they will continue to be followed in the event of an incident at the Facility:

- Accidents / Incidents Reporting Procedure;
- Procedure for Non-Conformance & Corrective Action;
- Emergency Preparedness Procedure; and
- Procedure for General Spillage.

The EMS and associated documents will be reviewed and updated, where appropriate, to allow for the proposed changes to the Facility, where necessary.

The Environmental Risk Assessment, provided in Appendix D, identifies the mitigation measures to minimise/control any environmental impacts associated with accidents at the Facility.

6.3 Contingency Plan and Procedures

Blue Phoenix has an existing EMS which covers all existing Site operations, including contingency measures in the event of breakdowns, enforced shutdowns and / or any other changes to normal Site operations.

Blue Phoenix also has a dedicated Procedure for Non-Conformance & Corrective Action, which will be followed when necessary. The EMS and associated documents will be reviewed and updated, where appropriate, to allow for the proposed changes to the Facility, where necessary.

6.4 Decommissioning

Blue Phoenix has an existing Site Closure Plan for the IBEA facility. Following completion of detailed design, the Site Closure Plan will be reviewed and updated, where appropriate, to allow for the proposed changes to the Facility.

Appendices

A Plans and drawings

B Dust Management Plan

C Noise Assessment Plan

D Environmental Risk Assessment

E Site Condition Report

F ISO:14001 Certification

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