SUNDERLAND UTR FACILITY ENVIRONMENTAL PERMIT APPLICATION

Non-Technical Summary

Prepared for: Wastefront AS

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1.0 Introduction

SLR Consulting Ltd (SLR) has been instructed by Wastefront AS to prepare a bespoke Environmental Permit (EP) application for the proposed Sunderland Used Tyre Recycling (UTR) Facility, to be located at Extension Road, East End, within the Port of Sunderland, SR1 2NR (the site). The permit will be operated by Wastefront Sunderland Limited (Wastefront).

This Non-Technical Summary (NTS) provides a summary of the regulated facility, an explanation of exactly what is being applied for and a summary of key technical standards and control measures that will be implemented at the site.

1.1 Site Location

It is proposed to develop the facility on a brownfield site located within the Port of Sunderland centred on National Grid Reference (NGR) NZ 41364 56893. The site location is shown on Drawing 001 and the permit boundary is shown on Drawing 002.

The site is bordered to the north by an area used by Northumbrian Roads for aggregates processing, and to the south by a waste solvents plant operated by Tradebe, which is an upper tier COMAH site.

The main north-south access road within the docks lies to the west of the site, and to the east there is an area of open flat land before the sea wall. The enclosed area of the docks is located further to the west, and on their western side the former Hendon Railway sidings. The nearest residential properties are a development at the former Boys Orphanage, approximately 0.5km to the west of the proposed site, and further properties lie 750m south west, and 690m north west.

The surrounding land uses and receptors within 500m are identified on Drawing 003 Environmental Site Setting & Receptors. Cultural and Natural Heritage receptors within 2km are identified on Drawing 004 Cultural and Natural Heritage Receptors.

2.0 Proposed Development

Wastefront are proposing to develop and operate a new (UTR) facility to process up to 77,000 tonnes per annum (tpa) of end-of-life tyres by thermal treatment, cracking and refining to produce approximately 24,000 tpa of carbon black and 30,000 tpa of liquid products for use in tyre manufacture and synthetic fuels. Steel will be recovered as a by-product.

The key process steps and proposed technology is as follows:

- Shredding of used tyres and removal of steel wire;
- Treatment of the shredded tyres within pyrolysis reactors to produce a gaseous phase, liquid phase and carbon-rich solid residues;
- Distillation of the liquid phase to produce hydrocarbon fuels;
- Combustion of the cleaned gaseous phase and distillation of off-gas to provide fuel gas to heat the pyrolysis reactors;
- Combustion of the light distillate fraction in low speed diesel engines to generate power on-site;
- Separation of fine steel wire from the char followed by milling, pelletising and drying of the solid residues to produced recovered carbon-black (rCB);
- Treatment of all combustion gases, residual fuel gas and residual distillate in a regenerative thermal oxidiser; and

- Storage of intermediate and final products, feedstocks and wastes pending transfer off-site.

Phase 1 of the development will include a single pyrolysis line, distillation and liquid storage and Phase 2 will include expansion of 2 further pyrolysis lines and the hydrothermal/hydrocracking units.

Three possible feedstocks are considered: a typical blend of car and truck tyres, a blend in which truck tyres are predominant and a blend in which car tyres dominate. Two possible combinations of products are considered: one of which cuts the pyrolysis oil into naphtha, light distillate and "bunker oil" (i.e. a mix of heavy distillate and fuel oil components), the alternative which produces distinct heavy distillate and fuel oil cuts.

The application will seek the EA's approval for:

- Phase 1 and Phase 2 of the development;
- All three blends of tyres;
- Both distillation scenarios (both sets of liquid products).

The facility will fall under the UK Control of Major Accident Hazards (COMAH) 2015 regulations, as a result of the storage capacities for the liquid products.

3.0 Pre-Application advice

Enhanced pre-application advice was sought from the Environment Agency (EA) and a pre-application meeting was held on 30 July 2021. A copy of advice received from these discussions is provided in Appendix A. The EA noted that their position on the regulation of pyrolysis processes was still under development. However, following the initial pre-application advice and subsequent discussions with the EA it was agreed that the installation would be regulated under Section 1.2 A(1) (f) of the Environmental Permitting (England and Wales) Regulations 2016 (as amended) ('the EPR'), but because the fuel gas burned within the process would not meet end of waste and emissions no greater than the combustion of natural gas, that the IED Chapter IV and Annex VI requirements would apply to the combustion activities.

4.0 What is being applied for

4.1 Regulated Activities

The primary purpose of the development is to produce hydrocarbon fuels and as such, it is considered that the installation would be regulated under the following primary activity listed in Schedule 1 Part 2 of the EPR:

Section 1.2 Gasification, liquefaction and refining activities

Part A(1) (f) Activities involving the pyrolysis, carbonisation, distillation, partial oxidation or other heat treatment of—

(i) other carbonaceous material…

otherwise than with a view to making charcoal.

4.2 Specified Waste Management Activities

The waste management activities to be carried out at the site are detailed below:

- R3: Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).

4.3 Directly Associated Activities

The following directly associated activities will be undertaken at the site:

- shredding and sorting of non-hazardous waste;
- combustion of light distillate oil in low speed diesel engine generators;
- char processing by separation, milling and drying;
- combustion of gases in a conventional flare in extreme emergency situations only;
- receipt, storage and handling of waste;
- discharge of liquid effluent;
- storage and handling of chemicals, oils, products and residues; and
- storage of raw materials.

5.0 Application Contents

To support this application, the following documentation is submitted in addition to this NTS:

- Section 2: Application Forms;
- Section 3: Drawings;
- Section 4: Environmental Risk Assessment;
- Section 5: Air Emissions Risk Assessment;
- Section 6: Human Health Risk Assessment
- Section 7: Noise Impact Assessment;
- Section 8: Site Condition & Baseline Report;
- Section 9: Best Available Techniques and Operating Techniques (BATOT); and
- Section 10: Fire Prevention Plan.

5.1 Application Forms

Parts A, B2, B3, F1 and relevant appendices, of the EA's application forms have been completed in support of this application and are enclosed in Section 2 of the application.

5.2 Drawings

The following drawings have been prepared in support of this application:

- Drawing 001 Site Location Plan
- Drawing 002 Site Layout
- Drawing 003 Environmental site setting & Receptors
- Drawing 004 Cultural and Natural Heritage Receptors
- Drawing 005 Fire Prevention & Management Plan

They are enclosed as Section 3 of this application.

5.3 Environmental Risk Assessment

The Environmental Risk Assessment has considered the risks posed by the proposed facility to the environment. It includes assessment of fugitive emissions, dust, releases to surface water, litter, mud, pests and potential for accidents and incidents. The assessment concludes that with the implementation of the risk management measures described, potential hazards from the proposed development are not likely to be significant.

The Environmental Risk Assessment is enclosed as Section 4 of this application.

5.4 Air Emissions Risk Assessment

An Air Emissions Risk Assessment (AERA) which includes a detailed dispersion model has been carried out on the combustion emissions from the regenerative thermal oxidiser in accordance with EA guidance and is provided in Section 5 of this application. The conclusions of the detailed atmospheric dispersion modelling assessment of combustion emissions on sensitive human and ecological receptor locations arising from the proposed installation are as follows:

(a) there are no predicted exceedances of air quality standards for the protection of human health at the point of maximum ground level impact for any of the scenarios assessed.
(b) the predicted impact on designated sensitive habitats are considered insignificant according to EA guidance and will cause:
    a. 'no likely *significant effects (alone and in-combination'* to the SAC and SPA/Ramsar; and
    b. *'no significant pollution'* for the LWS.

5.5 Human Health Risk Assessment

A Human Health Risk Assessment (HHRA) has been carried out to assess the fate of the dispersion of dioxins and furans from the combustion emissions from the regenerative thermal oxidiser (RTO), in accordance with the Human Health Risk Assessment Protocol (HHRAP), developed by the U.S. Environmental Protection Agency (US-EPA) Office of Solid Waste (OSW) for conducting multi-pathway, site-specific human health risk assessments for waste incinerators.

The HHRA is presented in Section 6 of this application and concludes that the predicted impacts as a consequence of emissions from the RTO are all within limits for the protection of human health as defined by the Environment Agency and intake of dioxins and PCBs at all receptors are well below the EA's adopted Tolerable Daily Intake value of 2pg I-TEQ/kg BW/day.

This conclusion is considered robust on the basis of the worst-case approach adopted in the characterisation of emissions, the safety factors incorporated into the US-EPA HHRA Protocol, and the hypothetical worst-case exposure scenario considered in the assessment.

5.6 Noise Impact Assessment

A noise assessment has been undertaken in accordance with BS4142:2014, whereby the sound sources under investigation have been compared to the existing (background) sound levels.

The noise assessment is enclosed as Section 7 of this application.

The assessment concludes that noise from the operation of the proposed facility will not have a significant impact upon local sensitive receptors.

5.7 Site Condition & Baseline Report

The Site Condition Report (SCR) provides details of the condition of the baseline soil and groundwater conditions within the proposed EP boundary, so that a comparison can be undertaken upon the eventual cessation of activities.

A copy of the Site Condition Report is enclosed as Section 8 of this application.

5.8 Best Available Techniques and Operating Techniques

The Best Available Techniques and Operating Techniques (BATOT) document describes how the site has been designed and will be operated in accordance with Best Available Techniques (BAT) as described in EA guidance and the relevant Bref notes. The document includes an overview of the technical, operational and management measures that will be implemented at the site.

The BATOT is enclosed as Section 9 of this application.

5.9 Fire Prevention Plan

A Fire Prevention Plan (FPP) has been prepared in accordance with EA guidance for FPPs[1]. The FPP details the required mitigation and management methods to prevent a fire of combustible materials stored on site.

The information contained within the FPP aims to meet the 3 main objectives of the EA FPP guidance:

- minimise the likelihood of a fire happening;
- aim for a fire to be extinguished within 4 hours; and
- minimise the spread of fire within the site and to neighbouring sites.

The FPP is enclosed as Section 10 of this application.

6.0 Key Technical Standards and Control Measures

6.1 Technical Standards

The key technical standards that will be followed for the site are:

- European Commission Joint Research Centre – Best Available Techniques Reference (Bref) document and BAT Conclusions (BATc) for Mineral Oil and Gas Refining (2015);
- Industrial Emissions Directive – Chapter IV Special Provisions for Waste Incineration and Waste Co-incineration Plants and Annex VI Technical provisions relating to waste incineration plants and waste co-incineration plants (24 November 2010);
- EA Industrial Waste Management; Establishing a methodology that supports the assessment of the impact of ATT processes ED13600100 March 2021;
- Environment Agency - A1 installations: environmental permits (June 2020);
- Environment Agency - Legal operator and competence requirements: environmental permits (April 2021);
- Environment Agency - Develop a management system: environmental permits (January 2019);

[1] Environment Agency – Fire Prevention Plans, May 2018. https://www.gov.uk/government/publications/fire-prevention-plans-environmental-permits/fire-prevention-plans-environmental-permits

- Environment Agency - Risk assessments for your environmental permit (March 2021);
- Environment Agency - Control and monitor emissions for your environmental permit (October 2020);
- Environment Agency - Best available techniques: environmental permits (February 2016);
- Environment Agency - Energy efficiency standards for industrial plants to get environmental permits (July 2019); and
- Environment Agency – Fire Prevention Plans: Environmental Permits (January 2021).

The pollution control measures relevant to the proposed activities are described in the BATOT and ERA documents submitted with the application.

The proposals have been assessed against and meet the technical standards described above.

APPENDIX 01

EA Pre-application enhanced advice

Environmental Permitting: record of enhanced pre-application discussion

Name: Daniel Ros **Job title: Permitting officer** **Office: RFH Warrington** **Contact number: +442084745138** **Date: 30/07/2021**

What is the activity?	Installation
Type of Application:	New Bespoke
Existing Permit No.	EPR/NP3900MP/A001
Application Expected Date	Q4 2021
Site Name and Address	Sunderland Used Tyre Recycling Facility Extension Road East End Port of Sunderland SR1 2NR NZ 41364 56893
Permit Type	S1.2A(1)(f)(iv)
Operator Name and Registered Office Address inc Companies House number	WASTEFRONT SUNDERLAND LIMITED Company number 12839955

Record of pre-application discussion

Record operator name and address on page 1

Permit number	EPR/NP3900MP/A001
Date/s of discussion/s:	28/07/021

Record of officer/s carrying out pre-application discussions

Name: Daniel Ros

Job title: Permitting officer

Office: RFH Warrington

Contact number: +442084745138

Date form completed: 30/07/2021

Issues to discuss (See Operational instruction topic sections)

Is it likely to be a high public interest application?:

Possible but unlikely

Are there any confidentiality or national security issues:

None provided

What are the key priorities for this type of facility:

The enhanced pre-application advice has been sought for the following topics:

1. Advice to cover scope of application, guidance, fees and Nature, Conservation & Heritage screening;
2. Permit boundary and scope of activities within the permit application;
3. Confirmation of the activity descriptions, permitting approach and applicable regulations;
4. Requirements for any site management plans for noise and odour and any other local considerations that need to be addressed;
5. Requirements for any pre-operational conditions; and
6. Approach to consultation (local/national publication).

1. Scope of the application

The application to be submitted will be for a new bespoke permit. Forma Part A, B2, B3 and F1 should be submitted with the application.

The permit application fee for a Section 1.2A(1)(f) – pyrolysis activity, as defined in our charging guidance – reference 1.5.7, is £17,966. The subsistence charge is £21,710.

Nature conservation and heritage screening: already provided.

2. Permit boundary

The provided site plan clearly shows the permit boundary in green. It has been noted that the pipe that connects the east side of the site with the west side should be included in the permit boundary.

The site layout and buildings are identified and labelled on the site plan.

Once all the point source emissions (air, water, sewer, ground and groundwater) are known, these should be clearly labelled on the site plan. A separate site plan can be used if necessary.

3. Confirmation of the activity descriptions

Based on the provided information, EA's position is to consider the application as a S1.2 Part A(1)(f)(iv) activity, if IED article 42(1) – Chapter IV does not apply. All other activities will be considered directly associated activities, including the distillation. Please note that the night be subject to change as a result of the application determination process.

IED article 42(1) – Chapter IV does not apply if both of the following apply to the syngas:

- It is no longer a waste,
- It can cause emissions no higher than those resulting from the combustion of natural gas

If the syngas is burned on site and does not meet end of waste, and/or the residue is burned on site, the application is likely to be considered a S5.1 Part A(1) (b) activity.

The steps in NPS process are: duly making, consultation, assessment, review and issue. The end to end times vary for a permit application varies.

The following documents should be part of the application:

a) Non Technical summary

The following information should be considered for inclusion in the non-technical summary:

- A description of the Schedule 1 activity undertaken at the Installation
- A brief non-technical description of the facility, including the key stages in the "process".

- An indication of the scale of the operation e.g. production throughput.
- A brief description of the principal releases to all media (including noise, waste, energy etc.) and proposed abatement.

b) Site plan

Details provided at section 2 above.

c) Summary of management system

The summary of the management system should include the chapters and subchapters to give us an understanding of its appropriateness.

Waste competence certificate is not needed but the management system should identify training requirements.

d) Site condition report

The SCR related to a facility storing, using, producing or releasing hazardous substances should comply with H5 guidance by:

- Identifying 'relevant hazardous substances (RHS)'
- Including a stage 1-3 assessment where this identifies a risk to soil/and or groundwater – establish baseline reference data.

SCR guidance can be found here.

e) Technical description

The technical description of the facility should be provided. This should include but not limited to the following:

- The scope of the application, including the proposed scheduled activity and directly associated activities,
- Description of the type of system and all stages of the process – consider including a process flow diagram,
- Description of raw material used, acceptance criteria, handling, storage and efficiency of use,
- Infrastructure (E.g. secondary containment, tank specification, surfacing),
- Energy efficiency measures,
- Abatement techniques,
- Monitoring, monitoring frequencies and standards – consider commitment to MCERTS.

Guidance on Control and monitor emissions for your environmental permit can be found here.

f) Risk assessment

Link to risk assessment guidance here.

Air

Assessment should follow the methodology set out in Environment Agency guidance.

Where air dispersion modelling is submitted, it has to follow the following guidance, and the data input files should be supplied.

Water

Surface water pollution risk assessment for your environmental permit guidance.

Assessment for **hazardous pollutants** should follow the methodology set out in Environment Agency guidance

Requirements include:

- Apply each environmental risk assessment screening test to determine if the substances screen out as insignificant. Use of the H1 software tool is advised and this should be submitted with the application.
- For discharges to sewer, details of the trade effluent consent (i.e. any limits set, the sewage treatment works name and location of the final discharge point), Sewage Treatment Reduction

Factors (STRF) used.

Assessment of **sanitary determinands** should follow the methodology set out in Environment Agency guidance.

This may not be necessary for discharges solely of sanitary determinands to sewage treatment works.

If required, Modelling should be in line with Environment Agency guidance.

Ground and groundwater

Assessment should follow the methodology set out in Environment Agency guidance.

Habitats and receptors

All relevant nature and heritage sites, habitats and species should be identified and impacts assessed or provide sufficient information to support our assessment.

Human Health

A health risk assessment for dioxin and furans provided referencing either the USEPA Human Health Risk Assessment Protocol or the HMIP 1996 report.

Accident prevention and control

Storage, transfer and transport of high volumes of hydrocarbons pose a significant risk, therefore an assessment of containment and emergency procedures should be included in the application documents.

g) Management plans:

Fire management plan is required.

Odour management plan is required for refinery activities.

Noise and Vibration should not be an issue in this specific case, according to our Quantitative Noise Screening tool. No specific management plan required but noise and vibrations should be considered under BAT assessment.

Emissions management plan (commonly a dust management plan) is required if the site is receiving, processing or producing fine or dusty materials, and it is also within 500m of a sensitive receptor such as a home, school, hospital or nursing home, food preparation facility or similar.

Flood risk management plan – the site (at least part of the site) is in a high flood risk zone, assessment of risk of pollution in the event of a flooding event should be provided.

If you consider that you don't need any of these management plans, please provide a justification for our consideration.

h) Climate Change Screening

The climate change screening questions in Part B2, section 6b of the application form should be completed. Please refer to Part B2 Guidance for more information. If the score is 5 or more in the climate change screening questions please submit a climate change risk assessment.

i) BAT assessment

An assessment of the options taking into account cost vs benefits for:

- Furnace choice
- Abatement options and reagents used
- Cooling method
- Options for recovering heat

Energy efficiency and global warming potential need to be included in consideration of the options.

j) Syngas

Additional details should be provided regarding the techniques used to clean the syngas and a justification of how it will achieve the end of waste status. This needs to include measures to control/remove tar. Measurements in term of syngas monitoring as to show compliance with the end of waste specification should be provided. Situations when the fare will be used needs to be clearly described.

End of Waste

Considering that the syngas meets end of waste and can cause emission no higher than natural gas,

details on the syngas specification needs to be provided and compared to natural gas.

Comparator date can be found at this external link.

Note:

At the moment there is no single Bref document that applies specifically to pyrolysis. Our current advice is to consider the Mineral Oil and Gas, Inorganic Chemicals BATc and Waste Treatment BATc for any common techniques as an indication of BAT.

I have attached an internal guidance on assessing ATT. This provides a reference for syngas clean up techniques which can be used as BAT (Section 3). The document is a "Technical Reference Manual on alternative thermal waste treatment techniques commissioned by the Environment Agency in order to determine when Chapter IV IED applies". We are currently looking at how to implement the recommendations.

Additional details on end of waste are also included in the same document.

If any materials from the thermal treatment of waste are subsequently burned as waste, chapter IV applies to that incineration. This means that it can still be a S1.2 A(1) activity with Chapter IV applied and the Annexe VI requirements will need to be met for that part of the installation. From the information provided, this is potentially the RTO and the pyrolysis retort heating.

4. Requirements for any site management plans

Discussed in the management plans section above.

5. Requirements for any pre-operational conditions

This will be decided as a result of the technical assessment at the application determination stage but we usually require, through an improvement condition, more frequent monitoring and reporting in the first months of operation. These will be requested through a report to be approved by the EA that will show that the emissions are within expected limits.

6. Approach to consultation

We do not foresee that this application will be considered of high public interest. As such, we will consult with the local council and a few other local stakeholders and publicise the application on our website. We allow one month to provide comments and this happens whilst we determine the application.

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