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VALENCIA WASTE MANAGEMENT LTD

SHELFORD LANDFILL VARIATION APPLICATION (EPR/XP3434HX)

BEST AVAILABLE TECHNIQUES ASSESSMENT

NOVEMBER 2023

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DATE ISSUED:	**NOVEMBER 2023**
JOB NUMBER:	**ST20075**
REPORT NUMBER:	**004**
VERSION:	**V2.0**
STATUS:	**FINAL**

VALENCIA WASTE MANAGEMENT LTD

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BEST AVAILABLE TECHNIQUES ASSESSMENT – MATERIALS RECOVERY FACILITY

NOVEMBER 2023

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1 INTRODUCTION

1.1.1 Wardell Armstrong has been appointed to prepare an application to vary the permit for Shelford Landfill Site at Shelford Farm Estate near Kent. The site is operated by Valencia Waste Management Ltd (Valencia) under permit number EPR/XP3434HX.

1.1.2 The site is permitted to accept non-hazardous commercial, industrial and household waste for disposal, as well as for the treatment of leachate arising from the landfill.

1.1.3 Valencia is seeking to prevent recyclable and recoverable wastes from going to disposal, in accordance with the principles of the waste hierarchy. The variation will allow mixed non-hazardous waste arriving at the landfill to be first treated to recover metals, wood and plastic for recycling, then further treated to remove non-combustible material to prepare the combustible wastes for energy recovery off-site. The residual waste will be placed in the landfill.

1.1.4 This document provides an assessment of Best Available Techniques (BAT) shows how the site will comply with 2018 BAT Conclusions for Waste Treatment and the Appropriate Measures for non-hazardous and inert waste facilities.

2 COMPLIANCE WITH 2018 BAT CONCLUSIONS

2.1.1 The variation will allow for the addition of an MRF with the purpose of removing recyclable and non-combustible materials from incoming non-hazardous waste streams to prepare combustible waste for recovery off-site, with the benefit of preventing recoverable and recyclable wastes going to disposal.

2.1.2 The facility will classify as an installation under the Environmental Permitting (England and Wales) Regulations 2016, with the activity falling under Section 5.4 A(1) (b) (ii) i.e. a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day involving pre-treatment of waste for incineration or co-incineration.

2.1.3 As an installation, the MRF must apply Best Available Techniques (BAT) as set out by the European Commission in the 2018 BAT Conclusions for Waste Treatment. Table 2.1 below assesses the MRF operations against the relevant BAT Conclusions and describes how the site will comply.

2.1.4 The Environment Agency has recently published appropriate measures for the transfer and treatment of non-hazardous and inert waste. These are largely based on the BAT conclusions. This document, along with the other documents that make up the application show how the appropriate measures are applied.

2.1.5 Further detail regarding the measures in place is given in the EMS Summary, Operating Techniques, Odour Management Plan, Dust Management Plan, Fire Prevention Plan and Environmental Risk Assessment.

Table 2.1 Compliance with the 2018 BAT Conclusions

BAT Requirement	Compliance
BAT 1 Environmental Management System	Valencia has a companywide EMS which will be rolled out to the new Materials Recycling Facility (MRF), covering issues such as staff appraisal and training. Valencia's Environmental Management System Summary is provided in support of the variation application. Standard operating procedures will be in place for waste pre-acceptance and acceptance and all waste treatment operations. Where necessary the EMS includes management plans submitted to the EA including an accident management plan and site--specific Fire Prevention Plan.
BAT 2 Site pre-acceptance and acceptance procedures, waste tracking, sorting of waste, wase	As described in the Operating Techniques support the application, pre-acceptance and acceptance procedures will be as those for the landfill, ensuring the waste is permitted and is suitable for transfer or treatment. Records will be kept

Table 2.1 Compliance with the 2018 BAT Conclusions	
BAT Requirement	**Compliance**
segregation and managing the quality of outputs	of all incoming waste, any treatment process to which it was subjected and outgoing materials. Where appropriate, manual sorting will take place to remove non-conforming materials or those that might impact waste treatment. Certain waste will be subject to mechanical treatment to improve waste recovery. Visual inspection of outgoing materials will be made to ensure they are of appropriate quality.
BAT 3 Inventory of waste gas and waste water streams	There will be no point source emissions to water or air from the permitted activities. Only water from roofs and clean areas will discharge to the existing surface water system.
BAT 4 Adequate storage at an optimised location. Separate storage for hazardous waste.	No hazardous waste will be received in the MRF. Storage bays provided to allow good management of waste types. Site designed with sufficient capacity. Wastes stored in building to minimise emissions.
BAT 5 safe handling including management of spills and staff training	No liquid wastes or powders to be accepted. Staff trained regarding safe storage, appropriate wastes for treatment, proper control of sorting machinery, quality of output and environmental risks (e.g. understanding of dust prevention plan and fire prevention plan).
BAT 6 and BAT 7 Monitoring emissions to water	Not applicable. No emissions to water.
BAT 8 Monitoring of point source emissions to air	Not applicable. No point source emissions to air.
BAT 9 monitor emissions from regeneration of solvents, treatment of solvents and use of solvents to decontaminate equipment containing POPs.	Not applicable. No waste solvents will be accepted. No POPs waste will be treated.
BAT 10 Odour monitoring where a nuisance at sensitive receptors is expected or has been substantiated.	Not applicable. There is no intention to treat putrescible waste. Only wastes with a low putrescible content, such as construction and demolition wastes and some commercial and industrial wastes, will be directed to the MRF. No odour nuisance has been substantiated. Daily olfactory monitoring will occur and will be recorded.
BAT 11 monitor energy, raw material and water use	Use of diesel, electricity, water and raw materials (e.g lubricants for site plant) will be monitored and recorded.
BAT 12 Odour Management Plan in place	An Odour Management Plan has been prepared and is submitted as part of this application.

Table 2.1 Compliance with the 2018 BAT Conclusions	
BAT Requirement	**Compliance**
BAT 13 Reduce odour by limiting residence times, using chemical treatment and optimising aerobic treatment	There will be no aerobic treatment on site. Chemicals will not be used as these may add to emissions and can mask rather than treat the odour. Residence times are limited. Waste will be turned round as soon as possible and will not be stored on site for more than 72 hours.
BAT 14 Minimise sources of diffuse emissions e.g. dust by minimising sources of emissions, using good quality well maintained plant, damping down where needed, cleaning waste storage areas having a leak detection and repair (LDAR) programme	Due to the type of waste treated LDAR is not applicable. Site roads and storage areas will be swept as necessary to prevent a build-up of dust. Plant will be maintained in accordance with the manufacturer's recommendations. A water supply is available to allow damping down where necessary. Emissions of particulates will be controlled in accordance with the Dust Management Plan.
BAT 15 and BAT 16 Flaring only for safety reasons, correct design of flare	Not applicable. The waste treatment does not generate flammable gas.
BAT 17 Noise Management Plan where nuisance at sensitive receptors is expected or has been substantiated.	Not applicable. The MRF will be set within the industrial setting of the landfill and is unlikely to cause and additional impact to sensitive receptors nearest to the site. Operations take place inside a building, further attenuating noise.
BAT 18 reduce noise by one, or a combination of appropriate location, proper operation and maintenance of plant, low noise equipment, noise attenuation.	The building will provide some attenuation. Doors will be kept closed. Plant will be operated by trained staff and maintained in line with the manufacturer's recommendations. Noise levels will be a consideration in purchasing new equipment with quieter models used where cost effective.
BAT 19 Manage water effectively by managing water use, recirculating water where appropriate, reducing the chance of overflows, roofing waste storage areas, impermeable surfacing and adequate drainage.	Water use will be metered and use of water for damping down dust or cleaning will be limited to that which is appropriate. Water in the water bath will be kept at an appropriate level to avoid overflows. All waste will be stored and treated in a building limiting contaminated run-off from the waste. Roof water and from clean areas will be kept separate. All waste storage and treatment areas will have impermeable pavement. Water collected in the building will be sent for disposal when required as it is likely to be contaminated. Roof water may be captured and used on site.
BAT 20 treatment of wastewater	Not applicable. The process does not use water other than in the water bath. Losses will be due to evaporation or within the sorted waste. There are no emissions to water so water treatment is not necessary.

Table 2.1 Compliance with the 2018 BAT Conclusions	
BAT Requirement	**Compliance**
BAT 21 Limit emissions from incidents by protecting plant from malevolent acts, effective controls, prevention of fire, incident management plan, logging incidents and reviewing for	A Fire Prevention Plan has been developed for the MRF, including management of firewater. There will be safe means to isolate plant in the event of an incident. Site security in place including fencing around the site and lockable door on the building, all incidents and near misses logged as reviewed on a regular basis for lessons learned.
BAT 22 reduce raw material use by substituting waste	Not applicable. Raw materials limited to those necessary for proper operation of site plant and use of waste is not appropriate.
BAT 23 Energy balance and energy efficiency plan	Specific energy use recorded. Energy used will be measured and reviewed on a regular basis. Plant will be properly maintained to prevent excessive use of diesel.
BAT 24 Reuse of packaging	Not applicable. Waste is accepted and dispatched loose.
BAT 25 Reduce emissions of dust to air by use of cyclone, fabric filter or wet scrubber or damping by injecting water into shredder The waste to be shredded is damped by injecting water into the shredder. The amount of water injected is regulated in relation to the amount of waste being shredded (which may be monitored via the energy consumed by the shredder motor). The waste gas that contains	No point source emissions to air external to the building. The 3 way separator has localised extraction which feeds air from the plant via a dust filter back into the building. Spray bar provided at transfer point for light wastes to minimise fugitive emissions to atmosphere from the 3 way separator.
BAT 26, 27 and 28 applicable to shredding of metal	Not applicable.
BAT 29 and 30 applicable to treatment of WEEE	Not applicable.
BAT 31 limit emissions of VOCs to air form mechanical treatment of waste with calorific value by use of adsorption, biofilter, thermal oxidation or wet scrubbing.	Mixed municipal waste to be treated and emissions of VOCs should not cause a nuisance. To be reviewed should olfactory monitoring show odour is a problem.
BAT 32 applicable to treatment of WEEE	Not applicable. No WEEE treatment on site.
BAT 33,34,35,36,37,38 and 39 applicable to biological treatment	Not applicable. No biological treatment on site.

Table 2.1 Compliance with the 2018 BAT Conclusions	
BAT Requirement	**Compliance**
BAT 40 Monitor waste inputs for metals, salts, odorous compounds, oxidisers and organics.	Not practicable where the input is mixed municipal waste or similar material. The waste will be subject to visual inspection prior to treatment to ensure that nothing is present that might damage the plant or cause other issues.
BAT 41 Limit emissions of dust, organic compounds and ammonia by use of adsorption, wet scrubber, biofilter or fabric filter.	Not applicable. No point source emissions to air.
BAT 42,43 and 44 applicable to re-refining of oil	Not applicable. No waste oil to be accepted.
BAT 45 reduce emissions of VOC to air by cryogenic condensation, thermal oxidation, adsorption or wet scrubbing.	Not applicable no point source emissions to air.
BAT 46 and 47 applicable to regeneration of spent solvent	Not applicable.
BAT 48 and 49 applicable to thermal treatment of spent activated carbon, contaminated soil and waste catalysts	Not applicable.
BAT 50 applicable to washing of contaminated soil	Not applicable.
BAT 51 applicable to treatment of equipment containing PCBs	Not applicable
BAT 52 and 53 applicable to treatment of liquid waste	Not applicable. Only solid wastes will be treated.

3 USE OF WATER

3.1.1 The process does not use water, other than in the water bath. Otherwise, use of water will be limited to damping down of dust and cleaning. As a rule, bays will be cleaned by dry sweeping or vacuuming to limit water use.

3.1.2 Water in the water bath will be constantly reused. Some losses will occur via evaporation and entrained in the waste. The system may need to be topped up using approximately 25m^3 of water a week.

3.1.3 A water meter is installed to monitor water use. Records will be kept of water usage and these will be reviewed annually with targets set for reduction where appropriate.

3.1.4 It is not intended to reuse water collected from the waste as in normal circumstances very little water will be present. By unloading and storing the waste inside a building the amount of run-off from stored wastes should be negligible. In the event of a fire the water collected in the building footprint is likely to be contaminated and will be taken offsite for disposal.

3.1.5 Consideration will be given to the collection of roof water for use on site for damping down dust or cleaning. This will be implemented subject to health and safety considerations being acceptable, that is legionella can be prevented.

3.1.6 Water use will be reviewed at least once every four years to assess whether any improvements can be made.

4 USE OF RAW MATERIALS

4.1.1 The following raw materials will be used on site:

- Lubricating oil for site plant
- Hydraulic oil for site plant

4.1.2 The new MRF is for the mechanical treatment of waste and so no raw materials are used directly in the process.

Raw material use will be reviewed at least once every 4 years and where more environmentally friendly options are available these will be adopted provide that they provide the correct performance and are cost effective.

5 USE OF ENERGY

5.1 Compliance with BREF Note on Energy Efficiency

5.1.1 In order to comply with the BAT Conclusions on energy efficiency, Valencia will have an energy efficiency and management system incorporated in their EMS. This will include a commitment from senior managers to use energy efficiently and to seek to reduce carbon emissions. Valencia is committed to complying with all energy efficiency legislation.

5.1.2 Communications will be made to staff to raise awareness of the energy policy and encourage employee engagement.

5.1.3 Energy use will be reviewed at least once every four years and targets for efficiencies will be set, seeking continuous improvement and reduction in emissions.

5.1.4 Where new plant is being purchased energy efficiency will be an important consideration and all processing plant, lighting and HVAC systems will be designed with expert input to ensure the most efficient schemes are adopted. This will include optimising layouts, assessing correct sizing of motors and using variable speed drives where appropriate and effective.

5.1.5 All plant will be part of the planned preventative maintenance programme and will be properly maintained so as to operate without excessive use of energy. Staff will receive training so that procedures are followed correctly and idling of plant or inefficient loads are avoided.

5.1.6 All energy use will be recorded so that quantitative comparisons can be made and energy savings can be properly assessed.

5.2 Specific Energy Consumption

5.2.1 To allow benchmarking and assessment of progress against any energy efficiency targets that are set the specific energy consumption will be calculated each year. An initial assessment of electricity usage is given below.

5.2.2 An overall breakdown of the power required by the recycling plant has been provided by the technology supplier, based on the installation of the technology at a number of Valencia's sites. This indicates that the plant will require a 627.71kW supply and will operate for 2,000 hours a year. The scale of the final scheme is to be confirmed and the energy use calculations will be updated as required when the site specific energy usage is finalised.

5.2.3 On the basis of the currently available information, it is anticipated that the site will have an electricity usage of 1,255.42MWh per year.

5.2.4 This allows the potential carbon emissions to be calculated as shown in the following tables.

Table 5:1 Energy Consumption		
Energy Source	**Units/year as delivered MWh**	**At primary source Unit MWh /year**
Electricity from mains supply	1,255.42	3,013.01*
Total MWh	1,255.42	3,013.01
Notes: * When electricity from the national grid is utilised there are losses from the grid between the power station and the plant. Environment Agency guidance requires that a conversion factor of 2.4 is used to account for this. https://www.gov.uk/guidance/assess-the-impact-of-air-emissions-on-global-warming#greenhouse-gases-impact-of-your-emissions		

5.2.5 As the site will process 150,000 tonnes of waste a year the specific energy use per tonne of waste treated will be as follows:

Table 5.2 Projected SEC for First Year of Operation			
Year	**Total Energy Consumption (kWh)**	**Total Waste received (tonnes)**	**Projected SEC for year (kWh/ Tonne)**
1	3,013,010	150,000	20.08

5.2.6 Since the quantity of waste treated may vary from year to year the specific energy usage can be calculated to make like for like comparisons regarding energy efficiency.

5.2.7 Currently the expected energy usage would equate to the following carbon emissions.

Table 5:3 Annual Carbon Dioxide Emissions from Energy Use			
Energy source	**Primary Energy Usage (MWh)**	**Conversion factor & CO_2 factor**	**CO_2 (tonnes per annum)**
Electricity	3,013.01	0.166*	499.66
TOTAL	3,013.01		499.66
* Conversion factor taken from https://www.gov.uk/guidance/assess-the-impact-of-air-emissions-on-global-warming#greenhouse-gases-impact-of-your-emissions accessed on 7th April 2020.			

5.2.8 As yet there is no estimate of diesel usage for mobile plant at the site. During the first year of operation diesel usage will be monitored and recorded, allowing this to be incorporated into the specific energy use calculation. An assessment of available mobile plant will be made at the point that it is ordered to establish whether available diesel or electric plant is more suitable for operational purposes.

5.2.9 Energy use will be recorded and will be reviewed at least once every four years to assess where savings could be made. Where assets come up for replacement consideration will be given to the following options:

- use of more efficient models;
- use of alternative fuel (e.g. biofuels);
- use of renewable electricity where possible.

6 WASTE MINIMISATION

6.1.1 The whole purpose of the variation is to move waste further up the waste hierarchy. Waste treatment will allow the recovery of ferrous metal for recycling. It will also allow energy recovery from waste that might otherwise have been landfilled. Finally, the fines from the trommel will be used as daily cover on the landfill, minimising the use of non-waste for that purpose.

6.1.2 At least once every four years the waste treatment will be reviewed to determine whether there are cost effective options for improving recovery of materials for recycling.

6.1.3 The process itself uses few raw materials and generates little new waste. This will be limited to rags and waste oil from plant maintenance. Waste oil will be sent for recycling wherever possible.

6.1.4 All wastes will be stored in appropriate bays or containers and waste oil drums will be provided with a bund as secondary containment.

6.1.5 All waste dispatched from site will be sent to a permitted waste recovery or disposal facility. Transfer notes will be provided (or consignment notes for waste oils that are hazardous). Records will be maintained detailing the quantity of waste dispatched form the site and its final destination.

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