

Natural Resources Wales permitting decisions

**Parc Adfer Operations Limited –
Parc Adfer Energy Recovery Facility
Decision Document**

Contents

Normal Variation	3
Purpose of this document	3
Structure of this document.....	3
Key issues of the decision.....	4
Receipt of Application	4
The facility	4
European Directives	4
The site.....	4
Operation of the Installation – General Issues	6
Administrative Issues.....	6
Management.....	7
Site Security	7
Accident Management	7
Off-site conditions	7
Operating Techniques	7
Energy Efficiency	8
Waste Management.....	8
Environmental Risk Assessment.....	8
Minimising the Installations environmental impact.....	8
Emission limits	9
BAT Assessment.....	9
Acid Gas Abatement.....	9
NO _x abatement	9
Technology Provider (Boiler & Turbine).....	10
Emergency Expansion Flap.....	11
Monitoring.....	11
Reporting.....	11

Normal Variation

The application number is: PAN-002276

The operator is: Parc Adfer Operations Limited

The Installation is located at: Parc Adfer Energy Recovery Facility, Deeside Industrial Park, Deeside, Flintshire, SW1E 5BH

We have decided to grant the permit variation for the Parc Adfer Energy Recovery Facility operated by Parc Adfer Operations Limited

We consider in reaching that decision we have considered all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been considered
- justifies the specific conditions in the permit other than those in our generic permit template.

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Structure of this document

- Table of contents
- Key issues

Key issues of the decision

Receipt of Application

An application was received on the 23rd January 2018. The application was 'Duly Made' on the 5th February 2018. This means we considered it was in the correct form and contained sufficient information for us to begin our determination, but not that it necessarily contained all the information we would need to complete the determination.

The facility

The regulated facility is an installation which comprises the following activities listed in Part 2 of Schedule 1 to the Environmental Permitting Regulations and the following directly associated activities.

- S5.1 A1 (b) The incineration of non-hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity exceeding 3 tonnes per hour.
- S5.4 A1 (b) (iii) Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities covered by Council Directive 91/271/EEC – treatment of slags and ashes

There are several Directly Associated Activities (DAA's) that are associated with the above listed activities and these include; electricity generation, discharge to controlled waters, off-site transfer of process water not suitable for discharge to controlled waters and the use of an auxiliary generator.

European Directives

All applicable European directives have been considered in the determination of the application.

The site

The installation will accept up to 200,000 tonnes per annum of municipal, industrial and commercial waste for incineration in a combined heat and power (CHP) enabled Incinerator.

Waste will be received in the waste reception hall where it will be discharged into a bunker for temporary storage. Waste will be mixed in the bunker and then fed into a feed hopper.

The facility will process waste using moving grate technology. The energy recovered from the combustion of waste will be utilised (in the form of high pressure steam) to produce electrical power through a steam turbine and generator unit. The facility will also have combined heat and power (CHP) capability through a blanking flange and heat/steam export from the turbine which can be utilised upon securing a suitable customer.

The combustion of waste will release flue gases which will be treated to comply with the requirements of the Industrial Emissions Directive (IED).

Urea will be added at various stages of the boiler's combustion chamber to reduce nitrogen oxides (NO_x). Lime and powdered activated carbon (PAC) will be used within the Flue Gas Treatment (FGT) system. The lime reduces acid gas emissions while the activated carbon reduces mercury and the formation of dioxins/furans. The by-products from both reactions are captured in the fabric filter as Air Pollution Control Residues (APCR).

The facility will be designed to generate approximately 18.8MW and export approximately 16.6MW of electricity (assuming zero heat off-take).

Incinerator Bottom Ash (IBA) will remain after the combustion of the waste. This ash will be discharged from the end of the combustion grate directly into an ash quench bath. Ash from the first to fourth boiler pass will discharge to the IBA Storage area. Originally the installation proposed an ash processing area which allowed the storage and management of the IBA from the ERF combustion process. The IBA facility initially comprised a weathering area where untreated IBA would be stored before processing, and an IBA processing building containing machinery that would process the ash. However, as part of this variation, this proposal has been abandoned. The operator has now proposed to replace this with an area where the IBA can be stored prior to removal from site. However, the listed activity will remain in the permit to give the operator the flexibility to reassess this operation in the future.

The site is located to the south east of the Dee Estuary within the Deeside Industrial Estate, 2km south west of the nearest village, Puddington. The site is on an area of brownfield reclaimed land, once consisting of tidal mudflats of the Dee Estuary that was previously part of the Shotton Steelworks facility. WTI have constructed new bespoke buildings to house the proposed waste management activities. Farmland and areas of open space lie approximately 50m to the north of the proposed permit boundary. The Borderlands railway line is adjacent to the east of the site. There are Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs) and Inshore Special Protection Areas with Marine Components (ISPAMs) within 2km of the site boundary.

The site is centred on National Grid Reference SJ 310 716. The surrounding land use is predominantly industrial. Immediately adjacent to the site lies Shotton Power Station, UPM's Paper Mill and Great Bear Distribution.

Access to the site will be via Weighbridge Road which runs parallel and adjacent to the western boundary of the site. Weighbridge Road can be accessed off the A548 located north of the site. The A548 links to the A494/A550 to the east of the industrial estate.

There are existing drainage ditches on site, and surface water drains running within 20m to the east and west of the site's boundary.

Operation of the Installation – General Issues

Administrative Issues

We are satisfied that the applicant is the person who will have control over the operation of the installation after issuing the variation; and that the operator will be able to operate the Installation to comply with the conditions included in the permit. The decision was taken in accordance with EPR RGN 1: Understanding the meaning of operator. We are satisfied that the applicant submitted OPRA profile is accurate, the OPRA score is used as the basis for subsistence and other charging in accordance with our charging scheme. OPRA is Natural Resources Wales method of ensuring application and subsistence fees are appropriate and proportionate for the level of regulation required.

Management

The operator provided a summary of the proposed Environmental Management System (EMS), however, the site is pre-operational but once running will be operated with an EMS certified under ISO14001. We are satisfied that appropriate management systems and management structures are in place for this Installation.

Site Security

We are satisfied that appropriate infrastructure and procedures will be in place to ensure that the site remains secure.

Accident Management

We are satisfied that the appropriate measures are in place to ensure that accidents that may cause pollution are prevented but that, if they should occur, their consequences are minimised. To ensure that the management system in use by the operator sufficiently manages the residual risks of accidents, permit condition 1.1.1a requires the implementation of a written management system which addresses the pollution risks associated with, amongst other things, accidents.

Off-site conditions

We do not consider that any off-site conditions are necessary.

Operating Techniques

We have specified that the installation must be operated in accordance with the techniques set out in Table S1.2 of the permit. The details referred to in that table describe the techniques that will be used for the operation of the Installation that have been assessed by Natural Resources Wales as BAT; they form part of the permit through permit condition 2.3.1 and Table S1.2 in the permit schedules.

Energy Efficiency

The operator supplied the R1 calculations for the original and the new technology to show that the energy efficiency is greater with the technology proposed.

The R1 calculation shows that with the new technology, the overall boiler efficiency is 88% \pm 1.5%, this is compared to 87% \pm 1.5% with the original technology.

NRW agrees that the R1 calculation shows an increase in efficiency and that the new proposals represent BAT.

Waste Management

The operator has proposed to replace the Incinerator Bottom Ash (IBA) re-processing area with 2 IBA storage bays. The IBA will now be stored in dedicated bays awaiting off-site treatment. The operator has stated in the application that the originally permitted IBA re-processing area will not be constructed at present, this includes all proposed ancillary equipment.

The area proposed for aggregate storage will now be landscaped as per the rest of the site and surface water run-off and capture rates will be reduced significantly.

The operator has stated that they wish to retain the re-processing permitted activity in the environmental permit. As this activity, has already been assessed as part of the original permit application, it gives the operator the flexibility in the future to pursue this activity if required.

Environmental Risk Assessment

Minimising the Installations environmental impact

Regulated activities can present different types of risk to the environment, these include odour, noise and vibration, accidents, fugitive emissions to air and water; as well as point source releases to air, discharges to ground or groundwater, global warming potential and generation of waste. Consideration may also have to be given to the effect of emissions being subsequently deposited on to land (where there are ecological receptors).

These factors are discussed in this document. For an installation, such as this, the principal emissions are those to air, although we also consider those to water and land.

There are no changes as part of this variation that alter the risk assessments carried out as part of the original permit application. There are no changes to any site emissions or ELVs and therefore there are no amendments to be made as part of this variation.

Emission limits

There are no changes to any of the emission limits as part of this variation.

BAT Assessment

Acid Gas Abatement

The operator assessed semi-dry and dry abatement techniques for the abatement of acid gases in the original permit application. The operator initially chose to use a semi-dry method based on the original technology. This variation changes this to a dry abatement method. All emission parameters remain in-line with the original permit application and permitted levels. There will be no changes to the ELV's or the emission monitoring. No additional assessment is required for this alternation to the abatement techniques. NRW considers this BAT for the installation.

NO_x abatement

The operator has made 2 alterations regarding NO_x abatement. Firstly, the operator has changed the method of flue gas recirculation (FGR). It was initially proposed to use a method called Internal Gas Recirculation, with this method the flue gas is drawn from the back of the furnace and recirculated alongside secondary air, this is considered BAT for NO_x abatement, however there are several issues with this process, affecting other parts of the process, mainly through corrosion and abrasion. The new method involves drawing the flue gases off after they have been filtered, this gives a cleaner flue gas and achieves a more conventional flue gas recirculation method. The result is the same and NO_x abatement is maintained at the original levels. Thermal efficiencies remain the same and there will be less problems with other parts of the process. We agree that this proposal represents BAT and is a suitable change to make whilst minimising NO_x emissions.

Secondly, the operator has proposed to install an advanced stage combustion system. The system uses the same pre-heated air as for the primary and secondary air systems and distributes it at a higher level within the furnace alongside the FGR.

By installing this system, it means that the incinerator can operate with and without the FGR, whilst still maintaining the performance as mentioned in the original application.

This system will not impact any of the temperatures or flows, this will be confirmed as part of pre-operational condition 4 - Computational Fluid Dynamics (CFD) modelling. The operator has stated that this will be carried out and submitted to NRW 3 months prior to commissioning, the CFD model will include all the changes mentioned above to demonstrate that the conditions in the permit can be complied with. The system will not change the predicted emissions of NO_x and the current ELV's in the permit will be maintained. This alteration will have no impact on BAT 40 of the BAT-OT document.

Technology Provider (Boiler & Turbine)

The technology provider for the installation has changed, the operator now proposes to use; Constructions Industrielles la Mediterranee (CNIM). The boiler combustion process remains a moving grate process but with a different boiler being installed, in this instance a Martin reverse acting grate, 5 pass with external economiser will be used. This boiler and turbine is in use in several plants across Europe and shows improved efficiencies to the technology initially proposed by the operator. As part of this change the installation has also increased the capacity of the installation from 25 tonnes per hour to 29 tonnes per hour, this gives a maximum of 232,000 tonnes per annum, however the operator has stated that they will restrict the capacity to the currently permitted level of 200,000 tonnes per annum.

The turbine can generate 18.8MWe (gross) and export 16.6MWe of energy to the national grid. The turbine remains CHP-ready as in the original application.

The operator supplied the R1 calculations to show that the efficiency was greater than the initial technology proposed. NRW agrees with the calculations and that this proposal represents BAT as it is an improvement on the original technology that was assessed.

Emergency Expansion Flap

The operator has proposed to install an expansion flap on the flue gas side of the boiler. This will be used to relieve pressure in an emergency. This is a standard addition to many incinerators across the UK. This has been proposed because of HAZOP studies.

The operation of the flap is considered abnormal operation and would only occur in an emergency. The operation of the flap is monitored and recorded by limit switches, the flap then shuts under its own weight.

The actual volume of gas that would be released in an emergency is quite small at around 100-200Nm³, this would consist of both flue gas and steam. For comparison under normal operation the hourly gas volume is around 125,000Nm³.

The air quality assessment does not need revising as this is an emergency release vent and as such will not be in continual operation throughout the year.

Monitoring

A flue gas sampling point has been installed within the FGT area in addition to the currently permitted sampling point on the stack. This approach is consistent with other permitted energy from waste plants within the U.K. The alterations meet all CEMs sampling requirements as outlined in Environment Agency guidance note M1. The main reason for making this change is to allow better access to the equipment for periodic sampling and maintenance.

Reporting

There are no changes to any of the reporting conditions as part of this variation.