# Natural Resources Wales permitting decisions

# Variation

We are minded to issue the variation for Mona Anaerobic Digestion Plant operated by Grays Biogas Limited.

The application number is EPR/AP3033HY/V004

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We consider in reaching that decision we have taken into account 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 taken into account
* 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**

* Key issues
* Annex 1 the consultation, web publicising responses

# Key issues of the decision

**Background and Competency**

The operator has applied for a substantial variation to their existing environmental permit for the operation of an Anaerobic Digestion (AD) plant. This variation is required to change the technical specification of the plant, including the installation of a larger Combined Heat and Power (CHP) plant (gas engine) and a revised plant layout. The variation also looks to change the feedstocks for the process.

Animal by-products waste such as offal will no longer be authorised, instead the new feedstocks will comprise of glycerol, effluent treatment sludge, chicken litter and biomass (silage). This variation also changes the permit boundary to accommodate the new plant layout.

The site is situated approximately 3 miles west of Llangefni, Anglesey (National Grid Reference SH419 755) and is part of the Mona Industrial Estate. The site is located at the northern boundary of the industrial estate and is accessed via the estate road, which runs past the western site boundary.

The site is located next to a poultry farm, a council run gritting yard, a waste transfer station (operated by Grays Waste Management Ltd) and RAF Mona Training Centre beyond. There are also numerous residential properties within the vicinity of the plant and further afield.

The AD plant is defined as a system for the generation, storage and utilisation of biogas. The biogas is generated through the microbiological formation of methane during the decomposition of organic substances.

Biogas predominantly consists of methane (CH4) and carbon dioxide (CO2) which is used to power an internal combustion engine for the production of electricity and heat. The electricity produced will be exported to the National Grid. Heat is used to aid the digestion process.

Finally the digested materials result in a material known as ‘Digestate’ which is a liquid containing some solid undigested material (typically plant tissue fibres). Digestate is a valued fertiliser when applied to land and has added environmental benefits when used in place of conventional chemical fertilisers.

The operator has shown that they are technically competent to operate this facility. The operator has submitted a complete management system that takes into account all aspects of the operation of the plant. As part of the application odour, noise and bio-aerosols were considered and technical assessments carried out. Within the environmental management system, the operator considers security, storage of waste and raw materials, a full list of operating techniques and procedures, health and safety, quality management procedures, point source and fugitive emissions, staff training and emergency procedures. This document (doc ref – 3407-819-A) shows competence to operate the AD plant.

The company that is building the plant, Agraferm, will supply an experienced plant supervisor to manage the start-up of the plant and then remain in place for a further 12 months after plant commissioning. All staff employed at the site will undergo a full training programme.

**Emissions to Air**

The proposed CHP engine has a total thermal input of 4.68MW and does not currently fall within the scope of Schedule 1 of the Environmental Permitting Regulations but for the purposes of the permit is considered to be a directly associated activity (DAA).

The previous application considered air quality from the CHP engine in relation to sensitive receptors and concluded ‘no likely significant effect’ to both human and ecological receptors. The air quality assessment supplied with the initial application in 2010 employed conservative assumptions;

* They assumed that the Emission Limit Values (ELV’s) in the Permit would be based on the benchmarks for landfill gas engines.
* They assumed that the Installation operates continuously at these emission limits for the whole year, when in reality it is more likely to operate for ~8000 hours per year.
* A conversion of NOx to NO2 of 100% was used for long term effects and 50% for short term effects. For impacts close to the Installation conversion factors of 70% for long term and 35% for short term could be more applicable.

During the assessment of this current application, it can be seen that there are no new ecological receptors compared with when the initial assessment was carried out, and since the CHP engine is less than 5MW, we are satisfied that this variation will cause ‘no likely significant effect’.

In relation to human receptors, as the ELV’s haven’t changed, the process contributions from the CHP engine are below the thresholds and are not likely to cause significant effect.

The CHP engine is slightly larger than currently permitted for but net thermal input is still only 4.86MW. Even taking this into account the emissions from the engine are not likely to cause significant effect to human or ecological receptors.

We are therefore satisfied with the emission limits set within the permit, and further modelling is not required due to the size of the engine. Environment Agency Guidance Document H1 Annex F suggests that;

*As stand-alone units, they are not considered to be major sources of pollution but are subject to the requirements of the Clean Air Act. Whilst it is important that the environmental impact of these sources is estimated, it is considered that the risk from these sources will not often warrant detailed dispersion modelling to be undertaken as part of this assessment.’*

As a precautionary approach, an improvement condition has been set in the permit requiring that, the operator shall monitor emissions from the gas engine for the determinants listed in Table S3.1 and the results shall be used to assess the environmental impact of the emissions on air quality standards.

**Emissions to Water**

The site is served by 3 separate drainage systems to ensure only clean and uncontaminated rain water is released into the local watercourse;

1. Uncontaminated Surface Water Drainage

Rainwater arising from site access roads, clean hardstanding areas, roof drainage, bund water (subject to testing) and unused silage clamps.

Water collected within this system is discharged into the adjacent water course and will be controlled to a flow rate of 5 l/s, this is possible due to the installation of a vortex flow control device. Prior to the outfall is a lined storage lagoon with the capacity to attenuate flows for a 1 in 100 year rainfall event. There is also a valve on the discharge point which can be closed to retain surface water within the on-site system.

The bunded containment area where the 2 digesters, post-digesters, digestate storage tank, waste storage tanks, feed hoppers and pasteurisation tanks are located is drained by 1 gulley to a dedicated 8,000 litre storage tank. There is a valve connecting this system to the surface water system, and is usually in the closed position.

Water stored in this tank will be tested for contamination (possibly caused by small spills of liquid during plant maintenance etc.) and diverted to the leachate tank if contaminated, or to the surface water lagoon if clean.

The attenuation lagoon storage capacity also allows for the bunded containment area run-off as a conservative approach.

All access roads and site drains empty to the attenuation lagoon via a full retention petrol/oil interceptor. Table S3.2 in the permit shows this emission point and any permit conditions that relate to the discharge of clean, un-contaminated surface water

1. Leachate Drainage

Leachate arises from the storage of silage (in concrete clamps), the storage of waste (within the waste reception building) and from other areas of the process where potentially polluting liquids are handled. Leachate is collected by a dedicated drainage system and held within an 80,000 litre storage tank. From here it is then pumped into the AD process to be used.

The silage clamps are drained by central trapped gullies, with a cut off drainage channel at the entrance to the clamps. A perimeter open channel runs around the outside of the clamps. All leachate and rainfall is directed into the leachate storage tank. However, if the silage clamps are empty and clean, a penstock valve can be operated to divert the clean run-off to the surface water system. Within the waste reception building there is a single, trapped gulley to collect waste liquid and wash-down liquid. This gulley is connected to the leachate drainage system.

Finally the designated digestate tanker connection point drains to a trapped gulley which is diverted to the leachate storage tank.

1. Foul Water Drainage

Site welfare facilities (toilets, hand wash basins etc.) will drain to a septic tank which will be regularly emptied by the operator.

**Emissions to Land**

There will be no direct emissions to land. As a condition in the permit, the operator is required to carry out periodic monitoring at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on a systematic appraisal of the risk of contamination.

**Site Condition Report**

It has been noted that there are no recorded incidents of pollution to air, water or land within the area and no evidence of previous pollution. The site does not lie in an area at risk of flooding. The reason that the site condition report is being assessed again is due to the change to the installation boundary and to accommodate the plant re-design. The assessment only refers to the new area of land that has been added in this variation.

A Geotechnical report was published in February 2009 and September 2010 as part of the operator’s original application. It was re-submitted with this application (Doc refs; 2033-819-G and 2033/819/J). An updated report was published in February 2016 and submitted with this application (Doc ref; 3407/819/H).

The report concluded that no significant contamination was encountered and the risk of encountering contaminated land in the works is low.

The land has historically been used for agricultural use and as a former RAF base. The report concluded that there is no evidence to suggest that the land could be subject to widespread industrial contamination.

The hydrogeology of the site has been investigated and the bedrock at the site is classed as a non-aquifer of negligible permeability, therefore it has been concluded that there is unlikely to be any significant effect on the hydrogeological condition on site.

Chemical testing was carried out as part of the operator’s assessment to identify if any ground contamination is present. The results indicate that none of the determinants measured exceed the published threshold values, and were in fact significantly below the threshold values. The installation is an anaerobic digestion facility, with the process taking place within a fully bunded and capped area, minimising any contamination or pollution to land. Therefore we are satisfied that with the materials used within the process and where the process is sited, the risk of contamination to ground is low.

As the site is in close proximity to Mona airfield, which was an active air field during WW2 there is a potential for contamination of the site by unexploded ordnance and munitions, it was therefore necessary to conduct an unexploded ordnance survey (UXO) on-site. The UXO concluded that the risk of unexploded ordnance or munitions was possible but unlikely and the risk is low.

The report did however make the following recommendations to further limit the risk;

* Communicating the risks; all stakeholders should be made aware of the UXO situation and the possible impact it may have on the project in the unlikely event of encountering a UXO.
* Safety Training; UXO safety awareness training should be given to all site personnel as part of the site induction.
* Risk Review; the UXO risk level should be subject to constant review and should be re-assessed should the situation warrant it.

**Fire Prevention & Management Plan**

The operator has provided a comprehensive fire prevention plan with the application.

The plan covers general site introductions, potential fire hazards and receptors, monitoring and mitigation of fire risks, fire containments and infrastructure, fire response procedures, post-fire site recovery and various drawings/plans.

The risk of fire has been considered due to the process of anaerobic digestion and the combustion of biogas in a spark ignition engine. Throughout the plan the risks and hazards have been identified and mitigation measures put in place to minimise the risks. Procedures have also been put in place to minimise risk and to also deal with events if they occur.

Regular inspections will be carried out of all site areas and will be undertaken in accordance with the site’s Environmental Management System. These inspections will be carried out by a person who is familiar with the requirements of the Environmental Management System, Environmental Permit and the Fire Prevention and Management Plan.

These regular inspections will keep the levels of dust, and other loose combustible materials, which could aid in the acceleration of a fire, on site surfaces to a minimum and ensure all containment of wastes on site are functioning effectively. Chicken litter and any other solid wastes will only be stored within the chicken reception shed and the biomass will be stored in covered clamps. The remaining feedstocks are liquid effluent and glycerol which are all stored in designated sealed storage tanks.

All inspections will be recorded in the site records. No wastes are to be burnt on site and all staff will be provided with extensive training on fire prevention, protection and occurrence procedures.

Firefighting equipment and a mains fire hydrant will be located on the main Mona Industrial Road if required, in addition fire extinguishers will also be available on-site.

All fuel tanks are bunded to 110% capacity on-site to reduce the potential for spills.

In accordance with the EA’s FPP guidance a 5 x 5 metre area has been designated as a quarantine area. This area also has a 10 metre buffer around it where no materials are stored. In the event of a fire, this area will be used either to isolate wastes which are smouldering to allow safe dissipation of heat without placing other areas on site at risk of ignition. This plan has been put together with the assistance of the local fire and rescue service. We are satisfied that this plan is detailed enough and covers the required aspects.

**Noise Assessment**

The operator carried out a noise assessment (Doc Ref; 101217) to predict the potential impact of noise from the Anaerobic Digestion Plant and the associated CHP engine on sensitive receptors. Background noise measurements were taken at locations representative of the nearest dwellings to the Installation.

The assessment took measurements at the location of the nearest residential dwellings to the proposed facility to obtain pre-development background sound levels. This data was then used to predict the potential impact of noise from the activities to be carried out at the facility. The assessment was carried out using the BS 4142:2014 methodology.

Predictions of noise from operational traffic, vehicle movement’s on-site and process equipment were undertaken in order to assess the potential impact of noise on existing residential receptors in the vicinity of the site. It was found that there would be a low likelihood of an adverse impact at the nearest noise sensitive receptor during day time periods.

During the assessment of night time periods there was found to be an adverse impact at the nearest receptor or group of receptors when all plant is operating concurrently. This includes the CHP engine, pumps, motors and digesters. In particular it was found that the CHP engine was the main contributor to the total sound level predicted at the nearest noise sensitive receptors during the night time.

The report concluded that mitigation measures were required in respect to additional acoustic insulation of the CHP engine container.

With these measures in place the assessment found that there will be adequate levels of protection against noise from the facility. The operator is therefore required to ensure that the CHP engine container has this additional layer of insulation.

Tonal analysis was also carried out during the assessment. The assessment indicated that it is possible that at certain times, a tone may be just perceptible at the receptor location when all plant is operating, due to the occasionally very low background sound levels, a 2 dB acoustic tonal correction was added to the derived specific sound level when the plant is operating at night. The results from the assessment take this into account and indicate that there is a low likelihood of effect from noise.

Other mitigation procedures have also been implemented in the noise and vibration management plan. Adequate maintenance of all plant equipment will be followed to reduce the levels of noise and generally all maintenance will be undertaken inside buildings during normal working hours. BAT standards on noise levels and the minimisation of noise levels from selected equipment will be employed. Noise monitoring will also be carried out on the site by the Plant manager or nominated deputy using hand held equipment.

As part of our determination of the application the noise assessment and management plans were submitted to our Air Quality and Modelling Specialists (AQMRAT) for assessment. The Impact of external free field noise at sensitive receptors resulting from equipment and activities associated with the proposed development has been reviewed in accordance with the assessment criteria of BS 4142:2014.

The report submitted by Grays Biogas Ltd indicates that, during daytime hours, noise originating from the plant will have a low impact at residential receptors while during night time hours, there is a low likelihood of adverse impacts at residential receptors. AQMRAT check modelling confirms that during daytime hours, noise originating from the plant has a low impact at residential receptors while during night time hours, the likelihood of adverse impacts is low.

Additional modelling was submitted to reflect the additional noise abatement on the CHP enclosure, AQMRAT check modelling confirms that during both daytime and night time hours, noise originating from combined sources has a low likelihood of adverse impact at residential receptors i.e. difference of <5 dB between the facility rating level and background at nearest receptor. Check modelling results indicate that overall, noise impacts as a result of activities associated with the proposed facility are not likely to result in adverse impacts at receptors.

The submitted report indicates that, during daytime hours, noise originating from the standby plant which includes all plant, emergency genset and flare will have a low impact at residential receptors while during night time hours, there is a low likelihood of adverse impacts at residential receptors. AQMRAT check modelling confirms that during daytime hours, noise originating from Standby plant has a low impact at residential receptors while during night time hours, the likelihood of adverse impacts is low.

As a precautionary approach an improvement condition in the permit (IC2) requires that the operator shall demonstrate that the plant is operated at levels that are in-line with the noise assessment predictions.

**Odour**

The operator has carried out an odour assessment with modelling to assess the impact of odour from various sources throughout the AD plant. The purpose was to quantify potential odour impacts at sensitive receptors surrounding the site. The consultant has followed Environment Agency Horizontal Guidance Note 4 (H4)

H4 defines benchmark levels for odour, above which there would be considered to be potential for odour annoyance at the receptor. The benchmarks are based upon the 98th percentile of hourly average concentrations for odour modelled over a year as follows:

• 1.5 odour units for the most offensive odours

• 3 odour units for moderately offensive odours

• 6 odour units for less offensive odours

Following relevant guidance on odour concentration, the anaerobic digestion process will likely produce moderately offensive odours, whereby a benchmark level of 3 odour units is most suitable.

The odour assessment identified 4 sensitive receptors in vicinity of the plant. These 4 locations were chosen as they cover every direction from the plant. Each monitoring area incorporates a number of sensitive receptors. The use of glycerol on site poses minimal risk to odour as this is an odourless feedstock. The assessment identifies the following as potential sources of odour;

* Exposed silage in the silage clamp;
* Exposed silage during transfer to the solids feeder;
* Delivery of Chicken litter
* Chicken litter and DAF during storage within the building;
* Chicken litter during transfer to the solids feeder; and,
* Digestate during transfer to tankers.

The silage will predominantly comprise of maize and grass, although other energy crops may be used. The silage clamp will be covered when the material is not being deposited/extracted for use in the process. The silage would be delivered in covered vehicles and the clamp only uncovered during the short time for delivery.

Therefore, potential odour emissions during delivery of silage are anticipated to be minimal. In the assessment it has been assumed that the end of the silage clamp will be exposed all day instead of the short delivery time, this means that the assessment is conservative and provides an overestimation of potential impacts.

Chicken litter will be delivered into a closed, dedicated reception building with fast acting roller shutter doors. Odour during delivery will be prevented as trailers will be fully covered and the building we will be under negative pressure. Liquid effluent will be delivered by sealed tanker and transferred to a dedicated sealed storage tank via sealed pipework. Any odour arising from the waste reception building will be controlled by a dedicated odour abatement system that will treat the air prior to discharge to the environment. The odour control system has been designed to treat odours in excess of 5 odour units. The odour control unit emission has been modelled as part of the operator’s odour assessment and modelling, the report concluded that there will be no adverse off-site impact.

Chicken litter, other solid wastes and silage will be transferred from the reception building and silage clamps to the solid feeder and feed hopper. From here the materials enter the AD process. Chicken litter will be added to the process daily and this is expected to take approximately 45 minutes to complete. Silage is added to the process daily and this is expected to take approximately 30 minutes. The odour modelling again is very conservative and over estimates the potential impact of the odour, as it has been assumed that the silage and chicken litter is continuously exposed. To minimise the odour impacts, the feed hopper will remain closed when not being loaded. During loading there will be odour abatement in use; this will take the form of an odour neutralising spray.

Digestate will be stored within a sealed tank so poses minimal risk of odour. When the material is removed from site it is by sealed tanker via sealed pipework. The tanker will however displace air during loading, this is seen as a potential odour source. The model provided again is highly conservative and assumes a continuous source all day, when in reality the loading will take approximately 30 minutes.

The modelling results of 98th percentile 1-hour mean odour concentrations at all receptors are predicted to be significantly below the assessment criteria of 3 OU.m3 and therefore it can be concluded that odour impacts are not likely to be significant. The assessment goes further and states that the predicted odour concentrations are below the most stringent benchmark of 1.5 OU.m3.

The operator’s odour management plan is also sufficient and outlines ways to minimise the odour even further. The operator has implemented the following controls to further minimise odour

* Daily cleaning of the reception, loading/unloading and manoeuvring areas within the building to prevent any build-up of degradable waste.
* Daily inspections of drains, details of the site inspections are recorded on a Daily Inspection Form.
* In the event of a breakdown where the plant cannot be repaired, no further waste will be accepted on site until the plant is operational again.

Monitoring will also take place in the form of daily olfactory monitoring and meteorological monitoring. Odour will be monitored at least daily around the perimeter of the site by a trained member of staff who does not work in areas where they could become accustomed to strong odours. If odour is noted on the site boundary additional monitoring will be undertaken. The results of the monitoring will be recorded in site paperwork and reviewed regularly. Contingency and emergency plans are also in place and available on site. Complaints of odour will be fully investigated and recorded by site personnel and there are procedures in place for this kind of incident.

As part of our determination of the application the odour assessment and management plans were submitted to our Air Quality and Modelling Specialists (AQMRAT) for assessment.

The consultant states that “the potential odours from the AD plant can be described as moderately offensive, given the feedstocks to be used …Therefore, a benchmark of 3 OU/m3 is considered most appropriate when considering potential for impact.”

However, the Digestate end product odour is likely to be in the ‘most offensive’ odour category. Therefore an odour benchmark level of 1.5 OU/m3 when assessing the overall impact of odour would be appropriate.

Based on the source odour emission concentrations assumed by the consultant. AQMRAT check modelling agrees with the consultant’s prediction that the predicted impact is likely to be less than the odour benchmark level of 1.5 OU/m3 as 98th percentile of hourly average concentration for ‘most offensive’ odours at sensitive receptors.

Grays Biogas odour assessments highest predicted 98th percentile of hourly average concentrations at sensitive receptors is 0.51 OU/m3. The consultant has concluded that “The modelled odour levels at sensitive receptors have been predicted to be significantly below even the most stringent odour impact assessment criteria and therefore the risk of significant odour impact at sensitive receptors is considered to be negligible.”

AQMRAT carried out check modelling and sensitivity analysis using dispersion modelling software Lakes AERMOD version 9.1.0. Numerical Weather Prediction data for the site location for the years 2012 – 2014 was also used.

AQMRAT conclude they are in agreement with the consultant that the modelling predicts that there is unlikely to be an exceedance of the odour benchmark level of 3 OU/m3 as 98th percentile of hourly averages at sensitive receptors, based on the source odour concentrations assumed by the consultant. Furthermore, AQMRAT agree with the consultant that the predicted impact is likely to be less than the odour benchmark level of 1.5 OU/m3 for ‘most offensive’ odours at sensitive receptors.

The following Improvement condition has also been put into the site permit to ensure that the site complies with the assumptions and outcomes of the odour modelling;

The operator shall review the effectiveness of the Odour Management Plan in preventing and minimising odour emissions from all point and fugitive sources during the first 2 months of operation.

This shall include a review of assumptions and conclusions drawn in the Odour Monitoring Report and the Dispersion Modelling Assessment, by sampling and measuring odour emissions from all point and fugitive sources. The review shall be undertaken in accordance with Natural Resources Wales and Environment Agency Guidance Notes H1 and H4.

This review will take place within 2 months of the AD plant being operational.

**Raw Materials and Waste Acceptance**

The site will accept 25,000 tonnes of Dairy DAF effluent, 3,000 tonnes of glycerol, 12,000 tonnes of chicken litter and 9,500 tonnes of biomass/biofuel annually. The permitted waste limit is 49,500 tonnes annually. Other waste streams are also accepted on-site and these waste streams are listed in schedule 2 of the site permit. Wastes that are not on this list are not authorised to be accepted on-site. The actual tonnages accepted on-site will vary due to commercial reasons.

The conditions of the permit require that all chicken litter and solid waste will be stored within the waste reception building with an odour control unit. All waste liquids will be stored within sealed tanks and vents attached to an odour control unit. Only biomass crops (silage) may be stored outside, even then the silage must be stored within silage clamps, fully covered by a plastic membrane.

Wastes will be transferred to the process as soon as is reasonably possible to minimise odour, and all treated material will be removed off-site as soon as is reasonably practical.

The waste acceptance procedures in place on-site are there to prevent the acceptance of non-compliant wastes. The procedures were submitted with the application as part of the site’s environmental management system. All records relating to waste acceptance and rejection will be kept and maintained within the site logbook, which will always be available for inspection. Any waste that is not authorised to be accepted on to site will be immediately re-loaded and returned to the waste producer or the waste will be quarantined in the waste reception building and removed from site by appropriate carrier as soon as possible.

Acceptance and storage procedures will be followed to minimise any environmental hazards from the feedstocks. In addition to the feedstocks the site will also have lubricating oil, gear oil, heating oil, red diesel, anti-freeze, nutrients and neutralising additives. Alternative and more environmentally friendly materials are under constant review. The operator will carry out a review every 4 years of all raw and auxiliary materials to assess new developments and if any suitable alternatives are available.

Mains water used will be minimised as process water will be recycled where possible. Opportunity for further significant water efficiency is therefore limited; however, optimising water efficiency for all uses at the site, the operator will review water use every four years in accordance with guidelines given in the Sector Guidance notes.

**Bio Aerosols**

A site specific bio-aerosol risk assessment (SSBRA), Environmental Risk Assessment (RA Spreadsheet) and Dust Management Plan (Doc Ref – 3407-819-A) has been prepared and submitted to NRW with the application for assessment.

Risk assessment and Management Plans

An environmental risk assessment was carried out by the operator, sources of dust were identified and these were considered to pose no significant threat under normal site management conditions. The Dust Management Plan outlines the control measures for fugitive emissions to air. Bio-aerosols can arise from the handling and movement of both chicken litter and silage. The main area within the process is the movement of materials from the silage clamps and waste reception building to the feed hoppers. The movement of the solid feedstock material is carefully carried out using telehandler and the distance the material is moved on-site is kept to a minimum. Movements are around 20m. The height at which the feedstock is dropped into the hoppers will be kept to a minimum. The feed hoppers will be closed when not being loaded with feedstocks and during loading operations an odour neutralising spray will be used to control the release of odours and bio-aerosols.

The solid wastes that are delivered to site are generally of a medium to high moisture content (biomass) and the chicken litter is of a medium to low moisture content. The procedures for delivery of the chicken litter state that the material will be transported to site from the neighbouring chicken farms in fully covered trailers, the material will then be deposited and stored within a fully enclosed, negative pressure reception building which is equipped with a fast acting roller/shutter doors that will be closed except when the chicken litter is being loaded or unloaded. An odour control system is used within this building. It has been estimated that the loading and unloading will take a maximum time 45 minutes each day.

The silage is delivered to site in fully covered trailers and stored within 1 of the 3 silage clamps that are covered by a plastic membrane. The walls are 5m high. The silage clamps will be covered when silage is not being delivered/removed for use in the process. It is anticipated that the end of the silage clamp will only be open for a maximum of 30 minutes per day.

Delivery vehicles are not allowed to enter the site unless they are sealed or securely sheeted. The risk of release is therefore minimised.

Good housekeeping will ensure the site yard areas are kept clean and regularly brushed. The chicken litter reception shed will also be emptied and cleaned at least weekly. Use of tarmacadam and concrete surfaces will minimise potential for dust generation by waste delivery vehicles arriving at the facility.

There are also site procedures in place, within the dust management system, that outline control measures, monitoring of bio-aerosols and complaints procedures should anything be visible/arise from the plant. These procedures within the Dust Management Plan are considered to meet indicative BAT requirements within the Sector Guidance notes.

Background Monitoring

As the plant is not yet operational the report only covers background bio-aerosols, and established a baseline. When the plant is operational, actual monitoring will be carried out initially on a monthly basis. This monitoring will be on-going, the results of the sampling will influence the dust management plan. As the dust management plan is a working document, it will be updated and changed as. The sampling is a requirement of the planning application and the operator must demonstrate that the risks associated with bio-aerosols have been considered. This was also a pre-operational condition within the original permit application. The Environment Agency Technical Guidance Note M17 (Monitoring of particulate matter in ambient air around waste facilities, version 2, 2013) and the Association for Organic Recycling (AfOR) protocol (‘A standardised protocol for the monitoring of bio aerosols at open composting facilities’, 2009) have been used where applicable for this assessment.

The sampling regime for bio-aerosols is weather dependant and locations for sampling is based on wind direction. 3 samples were taken on the 17th March 2016 in order to assess the background bio-aerosols within the vicinity of Mona Industrial Park;

1. Sample Point 1 – Upwind/Sensitive receptor 1 (grassed bund on Northeast permit boundary shared with the poultry farm. SP1
2. Sample Point 2 - Sensitive receptor 2 (Southwest permit boundary shared with bus and coach depot). SP2
3. Sample Point 3 – Downwind (Southwest permit boundary at the perimeter of a vacant field). SP3

The sampling was carried out using Casell Tuff 4 Plus personal air sampling pumps and SKC IOM Samplers containing sterile 25mm 0.8µm polycarbonate filters. The equipment was calibrated to operate at 2L/min. The samples were then sent to an independent laboratory for analysis.

The Environment Agency considers acceptable bio-aerosol levels as:

* Those before the start of the composting process(1); or
* Bio-aerosol levels that are no greater than;
	+ 1,000 cfu/m3 for total bacteria,
	+ 500 cfu/m3 for the thermophilic fungus *Aspergillus fumigatus* and
	+ 300 cfu/m3 for Gram negative bacteria.

(1) The guidance used for bio-aerosols is mainly used for composting. However in the absence of any Anaerobic Digestion specific bio-aerosol guidance, it was deemed suitable for use in this instance.

The results of the background bio-aerosol sampling is shown below;

SP1 – Mesophilic bacteria estimated at less than 389 cfu/m3

 Aspergillus fumigatus at less than 167 cfu/m3

 Gram negative bacteria at less than 111 cfu/m3

SP2 - Mesophilic bacteria estimated at less than 222 cfu/m3

Aspergillus fumigatus at less than 167 cfu/m3

 Gram negative bacteria at less than 83 cfu/m3

SP3 - Mesophilic bacteria estimated at less than 167 cfu/m3

 Aspergillus fumigatus at less than 167 cfu/m3

 Gram negative bacteria at less than 83 cfu/m3

The above results show that all of the background samples were below the acceptable levels stated by the Environment Agency.

As the plant is not currently operational the background assessment does not take into account bio-aerosols arising from the AD plant.

Accordingly, the permit requires the operator to initially carry out monthly bio-aerosol testing to assess the impact of plant operations on bio-aerosol levels at nearby sensitive receptors. These results will be assessed by NRW and monitoring frequency will be reviewed.

**Emissions and Reporting**

It is the standard approach to require CHP plant monitoring on all sites and ELVs or equivalent parameters or technical measures based on BAT have been set for the following point source emissions to air:

* NOx, SO2, CO, nmVOC, VOC

The ELV’s for the above parameters have been set to be environmentally protective.

We require annual monitoring of the CHP engine and emergency flare (if the flare operates in excess of 10% of the operational time of the plant)

We have also requested reporting for the above emission limits, amount of biogas produced by site, the total amount of waste and biomass treated, electrical power output, energy efficiency, electrical energy exported to the grid, electrical energy drawn from the grid, water usage, operational flare time and the amount of biogas combusted in the CHP unit per annum.

# Annex 1: Consultation - web publicising

Summary of responses to consultation, web publication and the way in which we have taken these into account in the determination process.

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| Brief summary of issues raised |
| 1. Concerned about vermin (particularly rats) will be attracted to the silage/crops stored outside the clamps.
2. Rats have previously been found in the silage stored on land by the plant.
3. Concerned that silage is stored outside and may cause an odour nuisance when materials are being handled. Also it was questioned why the material is not being stored and loaded under cover.
4. Concerned that birds will be attracted to the feedstocks stored outside and the potential risk of bird strikes at the nearby Mona airfield.
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| Summary of actions taken or show how this has been covered |
| 1. The application documents state that the silage clamps will be completely covered on-site, the clamps will only be exposed for a short period each day, when they are transferred to the feed hopper.
2. The silage has been removed from the land – however the silage in question was not on the same land as the AD plant. It was stored outside of the permit boundary. There are however control measures in place to prevent vermin. The operator has submitted a pest management plan and there are conditions in the permit which state that vermin needs to be controlled.
3. Silage crops are to be covered whilst being stored outside and only uncovered when materials are being handled. The current application included an odour modelling assessment that concluded that the odour from the handling and loading of silage into the feed hopper would be well-below the benchmark required for odour. The assessment was carried out on a worst case scenario where the modelling assumed that the silage would be uncovered 24 hours per day, when in fact it is actually around 45 mins per day. There is an Improvement condition in the permit requiring the operator to review the effectiveness of the odour management plan in preventing and minimising odours from all point and fugitive sources. This needs to be completed within 2 months of commissioning of the plant. More information can be found within the odour section of this document.
4. Silage within the clamps is covered when not being handled and the attenuation lagoon will have a net over the top – this will reduce the risk of nuisance from birds. As the airfield is operated by the RAF, they have been consulted as part of this process. All other feedstocks are stored within a building / tank. We have received no feedback thus far from the RAF. However a pre-operational condition has been imposed on the operator. This requires the operator to submit a bird management plan to NRW for assessment, ensuring all appropriate measures are taken to prevent the presence of birds. This needs to be submitted and approved before any operation can commence.
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| Brief summary of issues raised |
| 1. An electronic copy of the application was requested.
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| Summary of actions taken or show how this has been covered |
| 1. A CD was sent as requested, the CD contained the application and supporting documents for the proposed facility.
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| Brief summary of issues raised |
| 1. An electronic copy of the application was requested.
2. The capacity of the plant has seemingly doubled and some feedstuff will now be stored outside.
3. Concerned that the application appears retrospective as the upgraded engines can be seen on-site prior to a permit being granted.
4. More information is needed regarding regulations as to how close to residential properties this plant should be in view of the fact that it is much bigger than the original.
5. NRW need to ensure that the environmental effects of this project are properly examined before consent is given for the variation of this permit. Make every effort to protect the locality from odour and noise pollution so that there are no long term effects on our health, wellbeing and the ability to enjoy our homes.
6. Concerned about the risk of birds. The locality was plagued by seagulls especially at the weekend. The presence of birds so near a runway is also worrying.
7. There is little confidence that rules regarding odour, movement of feedstocks and noise will voluntarily be carried out. Re-assurance is needed that all monitoring procedures by NRW is in place.
8. Are NRW monitoring the commissioning of the plant? Is it a requirement for a written agreement to be in place before any input materials shall be delivered to site?
9. The hard standing area is bigger than the original, therefore has the capacity of the lagoon been adjusted accordingly. No survey has been completed on existing surface water pipes on the outfall in our field.
10. Concerned about potential odours arising from silage crops stored outside in clamps.
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| Summary of actions taken or show how this has been covered |
| 1. A CD was sent as requested, the CD contained the application and supporting documents for the proposed facility
2. Feedstocks have changed with this application. No animal waste will now be accepted, instead the feedstocks are chicken litter, DAF effluent, glycerol and silage crops. Plant capacity has increased and has been assessed as part of the determination process. Planning permission has already been approved for this site. Only silage will be stored outside, this will be in silage clamps covered by a plastic membrane. Liquids will be stored within sealed tanks connected to an odour control unit. All other solid wastes and chicken litter will be stored within the waste reception building which is also connected to an odour control unit.
3. The operator has had the engines delivered on-site and has been given permission to test the engines for a G59 connection. As the site has full planning permission the plant can be built however the plant cannot operate without an environmental permit.
4. All relevant information has been received and assessed. Noise, Odour and Bio-aerosols have been assessed by technical specialists within NRW. All site design and operating techniques/management plans have been assessed. Air and water quality has also been taken into account during determination. Full details of this can be found within Annex I – relevant decisions of the application documents.
5. As part of the determination process, all aspects of the plant design and operation have been scrutinised. Odour and Noise modelling and assessment has been carried out by the operator that concludes with low risk of noise and odour. These reports have been assessed by our air quality specialists. We have also concluded that the risk is low.
6. The attenuation lagoon will have a net over the top – this will reduce the risk of nuisance from birds. As the airfield is operated by the RAF, they have been consulted as part of this process. A pre-operational condition has been imposed on the operator. This requires the operator to submit a bird management plan to NRW for assessment, ensuring all appropriate measures are taken to prevent the presence of birds. This needs to be submitted and approved before any operation can commence.
7. The operator has submitted detailed management plans covering all aspects of the operation. The permit will detail how the facility will run and contains conditions to ensure this. A site officer will also visit the site periodically to audit this. Two improvement conditions have been included in the permit, the first requires the operator to review the effectiveness of the odour management plan in preventing and minimising odours from all point and fugitive sources. This needs to be completed within 2 months of commissioning of the plant. More information can be found within the odour section of this document. The second improvement condition requires the operator to undertake a noise assessment in accordance with procedures given in BS 4142:2014. Any noise sources identified as exhibiting tonal contributions shall be quantified by means of frequency analysis. This then needs to be submitted to NRW in the form of a report. This needs to be completed within 2 months of completion of commissioning of the plant. The commissioning of the plant is carried out by the operator. No wastes will be delivered or stored on the site until a permit has been granted.
8. The attenuation lagoon is fitted with a vortex flow control device and controls the rate of discharge to 5l/s. The lagoon has the capacity to attenuate a 1 in 100 annual event probability rainfall. The outfall also contains a penstock valve which can be closed to retain surface water with the on-site system. Full details of this system are contained in the application documents.
9. Silage crops are to be covered whilst being stored outside and only uncovered when materials are being handled. The current application included an odour modelling assessment that concluded that the odour from the handling and loading of silage into the feed hopper would be well-below the benchmark required for odour. The assessment was carried out on a worst case scenario where the modelling assumed that the silage would be uncovered 24 hours per day, when in fact it is actually around 45 mins per day.
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| Brief summary of issues raised |
| 1. An electronic copy of the application was requested
 |
| Summary of actions taken or show how this has been covered |
| 1. A CD was sent as requested, the CD contained the application and supporting documents for the proposed facility.
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| Brief summary of issues raised |
| 1. There is serious objection to the modification of this plant. Original consent was given to plant half the size. During construction it been allowed to made bigger without any consultation with people living locally who strongly objected to original plant.
2. The doubling of the capacity of the plant is going cause extra traffic on the A5. There will be more traffic and unpleasant odours of the vehicles passing. Vehicles will be also diesel polluting lorries and tractors. If there are tractors carrying to this plant will they be obliged to use road diesel or will they be on the cheap using red diesel.
3. Resident strongly against this project and amazed that it’s been allowed to increase its capacity without any public consultation.
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| Summary of actions taken or show how this has been covered |
| 1. An application has been received to vary the existing permit and this includes an increase in size. This has been assessed during the determination process and assessment has been carried out to ensure maximum environmental protection. Full planning permission has already been granted to the operator.
2. NRW does not assess traffic concerns, as this was considered as part of the planning application.
3. There has been public consultation through website and newspaper advertising. The size of the plant has been available throughout this period. Planning was issued in 2015 so the operator is allowed to build the plant, but without the relevant environmental permit in place, is not allowed to operate.
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| Brief summary of issues raised |
| 1. Concerns regarding the route surface water takes once discharged from the plant. Is there adequate space under the road for the flow of water?
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| Summary of actions taken or show how this has been covered |
| 1. The attenuation lagoon is fitted with a vortex flow control device and controls the rate of discharge to 5l/s. The lagoon has the capacity to attenuate a 1 in 100 annual event probability rainfall. The outfall also contains a penstock valve which can be closed to retain surface water within the on-site system. Full details of this system are contained in the application documents.
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| Response received from:  |
| **Anglesey County Council Environmental Health Department;**  |
| Brief summary of issues raised |
| No Comments Made |
| Summary of actions taken or show how this has been covered |
| N/A |

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| Response received from:  |
| **Betsi Cadwaladr University Health Board** |
| Brief summary of issues raised |
| No Comments Made |
| Summary of actions taken or show how this has been covered |
| N/A |

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| Response received from:  |
| **Health and Safety Executive (HSE)** |
| Brief summary of issues raised |
| No Comments Made |
| Summary of actions taken or show how this has been covered |
| N/A |

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| Response received from:  |
| **Public Health Wales (PHW)** |
| Brief summary of issues raised |
| 1. We recommend that the applicant undertake an air quality assessment to assess the impact of the emissions from road vehicles and the biogas engine on sensitive receptors.
2. We recommend that a robust odour management system is in place to reduce odour emissions so as not to give rise to community concerns.
3. We recommend that the bio-aerosol assessment referenced in the executive summary of the application (to be completed in March 2016) be forwarded to this office for review.
4. We recommend that any consent granted be subject to conditions, specifically these should include robust emissions management plans (dust, odour, noise), strict waste acceptance and handling criteria and provision of an accredited environmental management system (EMS).
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| Summary of actions taken or show how this has been covered |
| 1. As mentioned above in the decision document, we don’t find it necessary for another air quality assessment to be carried out. The CHP engine is small at less than 5MW. During the initial permit application in 2010 an air quality assessment was carried out. This was found to be satisfactory and we are satisfied this time around. Emission from road vehicles doesn’t fall under our remit and is dealt with during the planning process.
2. The operator has provided an odour management plan with the application. This has been assessed by NRW and found to be satisfactory. The odour management plan and modelling assessment has also been assesed by NRW air quality specialists and has found to be satisfactory.
3. Bio-aerosol assessment submitted to PHW for assessment – PHW have subsequently received the bio aerosol evaluation. PHW commented that the operator commissioned a background survey of the bio-aerosols in the vicinity of the proposed plant. PHW recommended that a follow up evaluation of bio-aerosols be commissioned when the plant is operational. Further recommendations said where bio-aerosols are shown to exceed background concentrations the operator instigate a bio-aerosol management plan detailing how they will control emissions. There is a condition in the permit that requires the operator take regular monthly samples for bio-aerosols at the locations used for the background study, this will be regularly reviewed by the operator and NRW, to determine future monitoring intervals and sample results.
4. The permit covers all of the above aspects and requires that the operator adhere to the management plans submitted as part of their application. There is an improvement condition in the permit that requires the operator to review the effectiveness of the odour management plan in preventing and minimising odours from all point and fugitive sources. This needs to be completed within 2 months of commissioning of the plant. More information can be found within the odour section of this document.
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| Response received from:  |
| **Royal Air Force (RAF)** |
| Brief summary of issues raised |
| No Comments Made |
| Summary of actions taken or show how this has been covered |
| N/A |