



GP PLANNING LTD

Ref:C025-01

24th June 2021

The Planning Inspectorate
Crown Buildings
Cathays Park
Cardiff
CF10 3NQ

VIA E_MAIL

Dear Sirs

Town and Country Planning Act 1990
The Developments of National Significance (Wales) Regulations 2016
Application by: Môr Hafren Bio Power Limited DNS/3236340Site
Address: Land off Newlands Road, Cardiff CF3 2EU

Further Information

Further to your letter of 15th June 2021, I attach the information requested in respect of the Welsh Government's Programme for Government 2021-26 and associated Well-being Statement, which were released on 15th June 2021.

The information requested is the Applicant's (Môr Hafren Bio Power Ltd) commentary on the above referenced documents and the proposed Môr Hafren Energy Recovery Facility's consistency with the objectives and commitments therein. The document is attached as Annex A to this letter.

WRATE

Further to your letter of 26th May 2021, we are in a position to respond to the matter the Inspector has raised in respect of the WRATE Lifecycle Assessment submitted as Appendix 2 of the Waste Planning Assessment (DOC 12).

We note the Inspector's request regarding the feedstock assumptions in the analysis and his request for evidence concerning the respective compositions of co-collected trade waste and residual commercial waste.

As requested, our consultant has prepared a letter response, which is attached as Appendix B to this letter.

In summary, the letter confirms that the modified WRATE Co-Collected trade waste profile used in the model is a very close match for the Môr Hafren Feedstock specification. The modifications made to the default WRATE waste profile were proportionate and overall conservative in terms of carbon benefit for the EfW project. The modified WRATE Co-Collected trade waste profile used in the model reasonably represents the landfill methane-generating potential of the proposed Feedstock for the Môr Hafren facility.

Further Representations

Your letter of 26th May 2021 also afforded an opportunity to comment on any further representations received by 10th June 2021 in respect of the Applicant's formal submissions and additional information submitted on 20th May 2021.

We were notified on 15th June 2021 that representations had been received from:

- NRW – *Comments and Clarifications on Dormouse*
- Cardiff Council – *Comments and Clarifications on Dormouse*
- Wentlooge Community Council – *Minor Comments*
- Marshfield Community Council - *Minor Comments*
- Residents Against the CF3 Incinerator - *Minor Comments*
- Welsh Water (already published)

The first five representations were uploaded to the DNS portal the same day.

We have reviewed the representations received and comment only on matters raised on the new information submitted.

For your ease of reference, we set out our comments below.

Response to NRW

We note NRW's letter response, dated 10th June 2021.

Bats

We note NRW are content with the conclusions and proposed mitigation set out in section 5 of DOC 118 Potential Bat Roost Feature Report. The Applicant, NRW and Cardiff Council have agreed that it is appropriate to address this in the draft LEMP planning condition (draft condition 30).

Dormouse

NRW have identified a series of requested amendments to the Dormouse Conservation Plan (DOC 119).

A precautionary approach has been taken at this stage and a Dormouse Conservation Plan prepared, assuming presence. At the Inspector's request further survey work is being carried out up until

November 2021, which will confirm presence or otherwise. It is at that point the formal requirement for a Dormouse Conservation Plan will be known.

Further to a discussion with NRW, and with the above in mind, it was considered appropriate that the Conservation Plan effectively remains in draft form, to be read in conjunction with the comments and clarifications below. The principles of the Plan and commentary should be linked to the draft LEMP and associated draft planning condition 30.

The final dormouse plan is also linked to the final landscaping details which would be approved prior to commencement of the development (see draft condition 28).

With regard to the concerns raised by NRW the following clarifications/commitments can be made at this stage:

- The Applicant wishes to reaffirm the overall basis of the assessment for the Dormouse Conservation Plan.

At section 5. *Assessment of Impacts* it states that based on the area of the Site, it is considered *'unlikely that the site could support a self-sustaining population of dormice, however they could pass through the site'*.

As such, the mitigation needs to be proportionate to the anticipated impact. The current Plan identifies 0.2 ha of habitat creation and the provision of long-term management of planted hedgerows and installation of 7 nest boxes. Although this does not compensate to the 2:1 ratio suggested by NRW, it is considered that this mitigates for the level of impact through the following:

- Replacement of bramble areas with thick hedgerows managed in the long-term to benefit dormouse and ensure that connectivity is maintained across the Site. The current bramble boundaries are limited and subject to pressures such as fly tipping, fire risk and trampling by ponies.
- Installation of dormouse nest boxes – this will provide an additional benefit to dormouse that is currently not available on Site with regard to shelter and breeding features.
- Notwithstanding the above, the Applicant is committed to extending the areas of dormouse habitat creation to as near to a 1:1 ratio as possible using the boundaries of the Site. As demonstrated on the plan at Appendix 2 in the Dormouse Conservation Plan, habitats to be created are based on the current landscaping scheme (which is shown in Appendix 1). It is considered that there are other areas available for shrub planting and hedgerow creation that could be included in the final landscape detail, e.g., a hedgerow along the full length of the northern boundary adjacent to the railway and additional sections of hedge around the attenuation feature and in the south-west corner.
- It should be noted that a large proportion of 'suitable' dormouse habitat lost is low lying bramble. Although bramble has benefits to dormouse, replacement of this area with smaller but more established hedgerow features is considered to form an important longer-term habitat for dormouse, providing shelter, forage and connectivity for the species.

- In addition to the 7 boxes installed in retained habitat, the Applicant will also install a further 7 boxes within the created hedgerows once they are established. As per section 8 of the Dormouse Conservation Plan these boxes will be inspected and maintained for the lifetime of the facility.
- Should dormouse be confirmed as present on Site then it is considered that the above measures would mitigate the impacts and form the basis of the licence approach. Dormouse surveys are ongoing with monthly checks programmed throughout 2021. So far, dormouse have yet to be confirmed as present during the May and June inspection of dormouse tubes.
- Concerns have been raised about lighting are will be addressed through the preparation and agreement of a Lighting Plan, with limited lighting of boundaries anticipated. The Draft LEMP (DOC 87 Version 2) addresses lighting at Section 2.2 (extracted below). It states:

2.2 Lighting Strategy

2.2.1 The Lighting Strategy will have the following objectives:

- **Preparation and agreement of a Lighting Plan.**
- No more than 1 lux light spillage (where possible and safe to do so) to avoid impacts on foraging and commuting bats.
- Where walkways are required low level type lighting (e.g. bollards or in-board light units) would be used to minimise light spill.
- In key bat foraging areas limit the height of lighting columns to keep light as close to the ground as possible and limit excessive light spill onto adjacent retained habitat areas that may be used by bats.
- Use of louvres/shields to direct light and avoid light spill into key habitat areas used by bats (e.g. retained boundary hedgerows and brook corridor).
- The space between light units can also be increased in more sensitive areas to reduce the intensity and spread of light where safe to do so.

- Long-term management of the new habitat is stated in Section 9 of the Dormouse Conservation Plan which states that the areas covered by the plan will be managed over the lifetime of the facility, with the plan reviewed on a 5-year basis.
- Monitoring is covered in Section 8 of the Dormouse Conservation Plan and it is considered that the final monitoring programme would also be confirmed through the final licence agreement with NRW.
- It is considered that final management details (e.g., hedgerow rotations) would be included in both the final version of the LEMP and final version of the Dormouse Conservation Plan appended to the LEMP as per the current draft planning condition.

Cardiff Council comments

Cardiff Council raise a series of concerns on the content of the Dormouse Conservation Plan. The following clarifications are provided at this stage in the context of the above comments:

- Habitat loss; bramble - As per the point above, the bramble on Site is sprawling in places and subject to pressures such as pony trampling. The replacement of this with managed hedgerows provides a long-term, targeted habitat feature that can be managed specifically for dormouse for the lifetime of the project.
- Herbicide – this is spot treatment during establishment. Once established use of herbicide would be reduced/reviewed.
- Fragmentation – the small gaps between the planted areas is not considered to form a fragmentation risk. Dormouse can cross relatively large gaps (e.g., including railway to the north) between suitable habitat areas as evident by their presence in this locality.
- Net reduction in ecosystem – as per the comment above, the site is assessed as not being at the scale to sustain a population of dormouse, but is could be used for passage/foraging. As such, the proposed compensation maintains that function through provision of connected hedgerows and in addition the inclusion of nest boxes. It is considered that boxes and mature hedges in the long-term will improve the overall value of the Site for dormouse. This is because management will be targeted specifically for dormouse with adaptive management as required. Long-term monitoring will also be secured.
- It should be noted that dormouse is yet to be confirmed as present at the Site. Depending on the outcome of the survey, the final approach set out in the Dormouse Conservation Plan will be tailored accordingly with the final LEMP details.

Wentlooge Community Council

The Council's comments are noted.

As stated above, presence of dormouse has been assumed in the Dormouse Conservation Plan, despite the view that it is unlikely the site could sustain a self-sustaining population. This explains why surveys had not been carried out. Notwithstanding the assessment work today, surveys are currently underway.

Marshfield Community Council

The Council's comments are noted.

Residents Against the CF3 Incinerator

The response from the residents is noted.

We comment as follows:

- Previous responses made by the residents are not considered 'valid'. The Welsh Government's Strategic Assessment published on 24th March 2021 forms the basis for our new assessment.

- Landfill figures cited are no longer relevant as the residual waste figures have been determined and are quoted in Tables 2-5 in of the SA document.
- With reference to section 4.2, it should be noted that Technical advice note (TAN) 21: waste states:

1.22 It should be noted that not all waste arising in Wales is managed in Wales, some is “exported” usually to other UK counties for treatment, recycling, recovery or disposal. Waste is also imported into Wales for management at Welsh facilities. It is not necessary for Wales to have within its borders a full suite of facilities necessary to comply with the requirements of the Waste Framework Directive, or to manage all of its own waste.

1.23 Factors including the volume of a certain waste, its frequency of arising and location may mean that some waste is better managed across the border. Similarly, Wales does not only manage its own waste arisings, waste is taken from other parts of the United Kingdom and treated, recycled, recovered and disposed of in Wales.

- For the avoidance of doubt, the reference stated (penultimate paragraph of page 2) relates to small scale plant, specifically:

“This would therefore mean a small-scale plant would not be allowable if waste is to be imported from outside of the proposed region (unless in close proximity to a region), in order to also avoid locking in transport emissions and associated pollution.

- Scenario 2 has been used as a consequence of the SA not taking into account the level of anticipated growth for this part of Wales (as stated in Table 1). This is clearly referred to in the updated WPA.
- For the avoidance of doubt, Trident Park is contracted to process 300,000 tonnes of MSW per annum. There is no evidence to support the assertion that this will be reduced. The residents acknowledge (page 4, paragraph 3) that additional C&I residual waste will arise as a consequence of future population and business growth.
- Trident Park’s future operations are entirely relevant given that it is currently the only facility that takes C&I waste in South East Wales.

Summary

In summary, it is considered that matters pertaining to bats are now agreed and suitable, draft conditions worded. The approach to dormouse and mitigation and management is agreed as appropriate with NRW and can be addressed through the draft LEMP planning conditions.

This leaves no outstanding technical matters with NRW as the regulator.

In respect of need, and despite the unfortunate sequence and timing of the Welsh Government's Strategic Assessment, an analysis based on the Welsh Government's own data demonstrates that there remains a need for the management of residual waste by EfW, at least until 2035/35.

Furthermore, the first paragraph at the top of page 6 of the Strategic Assessment does not rule out the prospect of grant of permission for facilities of 10MW or greater that **have** come forward, such as the Môr Hafren Energy Recovery Facility subject of this application and examination.

Yours sincerely

A black rectangular redaction box covering the signature area.

Maureen Darrie
Director

APPENDIX A: RESPONSE TO PROGRAMME FOR GOVERNMENT 2012-26

RESPONSE ON BEHALF OF MÔR HAFREN BIO POWER

WELSH GOVERNMENT

WELL-BEING STATEMENT, JUNE 2021

1. Further to a request for further information from the Planning Inspectorate, dated 15th June 2021, this Document sets out the Applicant's comment on the Môr Hafren Energy Recovery Facilities consistency with the objectives/commitments set out in the Welsh Government's recently published Programme for Government and Well-being Statement.
2. The Welsh Government published its Programme for Government on 15th June 2021. Within that document, 10 well-being objectives were set out. These are the objectives the Government will use to maximise its contribution to Wales' seven long term well-being goals.
3. Alongside the Programme, the Government has also published the Well-being Statement, setting out how the well-being objectives have been set in line with its statutory duty under the Well-being of Future Generations (Wales) Act 2015.
4. The First Minister, in his foreward to the Programme refers to climate change and nature emergency, stating:
The Programme shows how we will act decisively to tackle the climate and nature emergency so that people can go on treasuring Wales' rich natural resources for generations to come. It shows how we will continue to embed an approach to education and skills which allows everyone the best life chance.
5. The fifth objective relates to the above and states:

Embed our response to the climate and nature emergency in everything we do

We have the vision and ambition to address the climate and nature emergency. We will deliver a green transformation which starts in our local communities, with a focus on local green spaces, locally-grown sustainable food, locally-generated renewable energy and avoiding waste. We will make sure that nature and the climate are on the agenda of every public service and private sector business, and we will integrate positive action for nature into more of our economic activity.

We will:

- Legislate to abolish the use of more commonly littered, single use plastics.
- Introduce an extended producer responsibility scheme to incentivise waste reduction by businesses.
- Create a National Forest to extend from the North of Wales to the South.
- Harness the economic, cultural, and recreational potential of the National Forest as part of progress towards a sustainable timber industry.
- Create a new system of farm support that will maximise the protective power of nature through farming.
- Develop a Wales Community Food Strategy.
- Introduce legislation to deal with the legacy of centuries of mining and ensure coal tip safety; strengthening local authority powers to protect the public and the environment.
- Introduce a Clean Air Act for Wales, consistent with World Health Organisation guidance and extend the provision of air quality monitoring.
- Designate a new National Park to cover the Clwydian Range and Dee Valley.
- Support 80 re-use and repair hubs in town centres.
- Uphold our policy of opposing the extraction of fossil fuels in Wales, both on land and in Welsh waters, using the powers available to us.
- Expand arrangements to create or significantly enhance green spaces.

6. This well-being objective has been highlighted by the Inspector for the Applicant's comment. The Applicant also considers the fourth objective worthy of comment. The fourth objective states:

Build a stronger, greener economy as we make maximum progress towards decarbonisation

Devolution gives us the opportunity to re-build our economy and develop a modern and productive infrastructure which acts as an engine for inclusive and sustainable growth. We will create an economy which works for everyone, grounded in our values of progressive change – going forward together in the spirit of cooperation, not competition. New digital, economic and transport infrastructures will re-build and re-energise our communities.

We will:

- Launch a new 10-year Wales Infrastructure Investment Plan for a zero-carbon economy.
- Deliver the Digital Strategy for Wales and upgrade our digital and communications infrastructure.
- Create a modern legislative basis for transport in Wales.
- Lift the ban on local authorities setting up new municipal bus companies.
- Legislate to modernise the taxi and private vehicle sector and address the problems of cross-bordering.
- Implement our new Wales Transport Strategy.
- Build on the success of our concessionary travel scheme for older people and look at how fair fares can encourage integrated travel.
- Work towards our new target of 45% of journeys by sustainable modes by 2040, setting more stretching goals where possible.
- Take forward the Burns Commission report for Newport.
- Develop a new major routes fund to improve the attractiveness and biodiversity of areas alongside major transport routes in Wales.

Applicant's Response

Strategic Policy Considerations

7. These documents should not be read in isolation.
8. The Welsh Government has published a number of documents in recent months, including:
- National Development Framework – Future Wales: the national plan 2040 –
 - Planning Policy Wales Edition 11, 24th February 2021
9. The National Development Framework is a spatial expression of national planning policy, setting the guidelines for where large scale growth will be focussed over the next 20 years. South East Wales region is a major focus for growth, with a national growth area incorporating Cardiff, Newport and the Valleys. The consequence of growth and implications for infrastructure are set out in DOC 82. The framework includes provision for a co-ordinated framework for waste treatment and disposal in Strategic Development Plans. Aligning strategic waste infrastructure with strategic growth is important to ensure that waste is diverted from landfill and dealt with locally. This aligns with the fifth objective above to embed our response to climate emergency in everything we do. The Môr Hafren facility provides that 'local' solution.
10. The Well-being of Future Generations Act places a duty of public bodies to carry out sustainable development, a concept that sits at the heart of PPW.
11. Sustainable development is defined in the Well-being Act as meaning:

the process of improving the economic, social, environmental and cultural well-being of Wales by taking action, in accordance with the sustainable development principle, aimed at achieving the well-being goals. Acting in accordance with the sustainable development principle means that a body must act in a manner which seeks to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs.

12. The Act established seven well-being goals intended to shape the work of all public bodies in Wales. Paragraph 1.14 of PPW explains how these goals are applied to decision making:

In order to demonstrate that appropriate consideration has been given to the Well-being goals and sustainable development principle in the decision-making process, public bodies are required to have regard to the 'five ways of working' contained in the Well-being Act. These require consideration of: involvement; collaboration; integration; prevention; and long-term factors.

13. The planning system is central to achieving sustainable development in Wales.
14. The Welsh Ministers' general role in decision making, relevant to DNS projects such as the proposed Mor Hafren ERF, must also accord with the decision making principles in PPW and be led by an informed judgement on a development's sustainability credentials.
15. Paragraph 2.21 of PPW states:

Planning authorities should ensure that social, economic, environmental and cultural benefits are considered in the decision-making process and assessed in accordance with the five ways of working to ensure a balanced assessment is carried out to implement the Well-being of Future Generations Act and the Sustainable Development Principle. There may be occasions when one benefit of a development proposal or site allocation outweighs others, and in such cases robust evidence should be presented to support these decisions, whilst seeking to maximise contributions against all the well-being goals.

Sustainability Credentials

16. The proposed Môr Hafren ERF will provide a sustainable solution for the treatment of residual waste and low carbon electricity. The evidence submitted in support of the application fully endorses its contribution and important role in achieving the Government's ambitions towards climate and nature, while at the same time planning for significant growth in South Wales and Cardiff, in particular.
17. The proposed Môr Hafren ERF provides a sustainable means of dealing with residual waste in a carbon efficient manner while providing electricity to the local network and opportunities for off site utilisation of heat generated through the process.
18. The proposed site for the ERF has already been designated suitable for thermal treatment of waste. The land is allocated by Cardiff Council for future industrial development. It cannot be the Government's intention to frustrate development, in these circumstances.
19. A detailed analysis has been carried out on the proposed ERF's carbon credentials when compared to landfill. The Waste Planning Assessment contained a WRATE analysis at Appendix 2 and an R1 calculation at Appendix 1.

20. The R1 calculation is acknowledged as a 'sensible and appropriate' approach by NRW (see letter dated 10th June 2021) and demonstrates that the proposed plant is designed to be highly efficient and sees the plant's status in the Waste Hierarchy as recovery.
21. The WRATE Lifecycle Assessment was carried out to identify the carbon impacts of the proposed ERF. The findings of that assessment clearly demonstrate the carbon savings as a result of the energy generated by the facility offsetting energy generated by fossil fuels; and offsetting the releases from the landfilling of such residual waste (ie that material remaining after recycling). The CO₂ equivalent saving of operating the proposed ERF is 47,307 tonnes per annum compared to landfill. Over the life of the facility that equates to over 1 million tonnes of carbon saving. The saving equates to around 15,913 cars being taken off the roads each year.
22. Appendix B to DOC 120 confirms that the waste profile used in the WRATE Lifecycle Model closely matches the proposed feedstock for the Môr Hafren ERF. The modifications made to the default waste profile, were proportionate and overall conservative in terms of carbon benefit, meaning that the actual benefit expressed above could be improved upon.
23. The proposed development comprises an ERF, fuelled by residual waste (i.e. that commercial and industrial waste remaining post treatment and destined for landfill), to generate electricity that will be exported to the local electricity network via the District Network Operator (DNO), Western Power. It is anticipated that the 15MW of electricity generated will be used locally to power local businesses, housing and infrastructure. However, if at any time there is a surplus that would be exported to the National Grid.
24. The proposed ERF will process up to 200,000 tonnes of residual commercial and industrial waste per annum to export around 15MW of electricity to the local network. The electrical output is equivalent to the requirement of around 30,000 houses.
25. This is a local solution, aligned firmly to strategic growth as well as providing certainty in local supply of electricity and the problems of intermittency of supply seen with renewable sources (such as wind and solar).
26. In summary:
 - The ERF has a positive role to play in providing a sustainable waste management solution that recovers value from waste to provide outputs as electricity and reduce the reliance on landfill.
 - The proposed ERF will make a major contribution to the waste hierarchy by diverting up to 200,000 tonnes of waste from landfill per annum and contribute to an overall carbon saving.
 - The proposed ERF provides a local waste management solution that assists in responding to the level of demand afforded by growth. It will assist in ensuring that waste is dealt with in proximate manner, minimising emissions to air afforded by long distance transportation.

Environmental Credentials

27. The proposed facility has been subject to a comprehensive and detailed assessment, including the requirements of the Environmental Impact Assessment. This has enabled statutory consultees to fully appraise the proposals and the potential for significant impacts.

28. There are no remaining technical, environmental objections to the proposed ERF from the statutory consultees and the Applicant has worked with statutory bodies from pre-application to examination stages to ensure that is the case.
29. The assessment work has been undertaken for the construction and operational phases of the development and robustly concludes that the proposed development will not impact on local well-being or on environmental receptors.
30. The development of the site at Newlands Road also incorporates significant benefits in terms of securing and managing the site, the adjacent ditch and biodiversity enhancement and the contribution the site makes to its setting in the SSSI. The site's development will see:
 - Management of adjacent ditch and its surroundings for the life of the plant;
 - Management of the vegetation surrounding the ditch;
 - Introduction of biodiversity enhancements including bird boxes, bat boxes, hibernacula and drowse boxes;
 - Perimeter landscaping surrounding the site managed specifically to maximise appropriate habitat.

Social and Economic Credentials

31. The third strand of sustainable development and contribution to well-being objectives are a proposals social and economic credentials.
32. The proposed ERF is a privately funded and financed initiative that will provide a merchant facility in an area of growth in South East Wales, releasing pressure on Welsh Government to provide alternative solutions to landfill. The level of investment in the facility is circa £150m.
33. During construction, the proposed ERF will give rise to direct employment at full time equivalent levels of around 356 jobs annually over the three-year construction phase.
34. As well as direct employment, the proposed ERF will create indirect and induced employment opportunities as a consequence of how the supply chains operate. Indirect and induced employment levels are calculated to provide an addition 461 full time equivalent jobs per year of construction.
35. The total direct, indirect and induced employment equates to 772 full time equivalent jobs per annum.
36. The proposed ERF will also generate additional Gross Value Added (GVA) through wider economic activity. Over the three-year construction phase, this is calculated to be worth £74.7m.
37. During its operational phase, the ERF would provide 25 full time, skilled jobs. Indirect and induced employment levels are calculated to be around 32.5 in the local area and a further 36 full time equivalent jobs in the wider area.
38. The proposed ERF will also generate additional Gross Value Added (GVA) during its operational life. This is calculated to be worth up to £15.7m in the local impact area and up to £43.73m in the wider impact area.

Conclusions

39. The proposed Môr Hafren ERF is a sustainable waste management facility, demonstrating positive sustainable environmental, social and economic credentials.
40. It responds to the Well-being of Future Generations Act by:
 - providing a **local** waste management solution that supports the growth aspirations for the locality;
 - providing 15MW of electricity to the **local** grid, via the District Network Operator, and will support local businesses, housing and infrastructure as well as providing opportunities for private wire transmission to support local businesses and investment into the area;
 - providing opportunities to provide heat to **local** businesses, and
 - contributing to sustainable waste by diverting residual waste from landfill, providing energy recovery and moving the means of waste management up the waste hierarchy.

Maureen Darrie

Director

GP Planning

June 2021

Date: 15 June 2021
Our reference: PB8790IBCO2106151310
Classification: Project related

Response to enquiry from the Inspector regarding the appropriateness of the composition of co-collected trade waste used in the WRATE model compared to the proposed residual commercial and industrial waste feedstock

The Inspector has raised the following query regarding the WRATE model:

The Inspector also wishes to draw attention at this stage to one particular matter that he wishes to explore at the forthcoming Hearing Session, concerning the WRATE analysis of carbon emissions savings compared with an equivalent tonnage of waste going to landfill over the operational life of the proposed ERF. The WRATE analysis states “The findings show a CO2 equivalent saving of the Mor Hafren ERF operation of 46,307 tonnes per annum compared to landfilling the waste... This benefit is primarily derived from the avoided methane from the landfill alternative option, plus a small net carbon benefit from the low carbon energy recovery.” The finding appears to be predicted in an assumption that the proposed ERF feedstock would have the same methane-generating potential if it were going to landfill as the “co-collected trade waste” waste stream (a mix of commercial and household waste) used in WRATE.

The inspector wishes to know what evidence concerning the respective compositions of co-collected trade waste and the residual commercial and industrial waste which the proposed ERF would target supports this assumption (and therefore the overall calculation as to comparative carbon performance).

The latest version (v. 4.0.1.0) of the WRATE model¹ was applied for the purposes of deriving the carbon impact of the proposed Energy from Waste plant. The feedstock for the facility has some key performance parameters, notably the calorific value (CV), which is a fundamental factor in the energy output of the plant. The feedstock for the facility is proposed to comprise a range of sources of waste, specifically a mix of C&I, residual MSW, and RDF (that is produced from a mix of C&I and residual MSW). The developer provided the modeller with a Feedstock specification².

WRATE contains a range of default waste composition profiles that are based on actual composition

¹ Waste & Resources Assessment tool for the Environment, developed for the Environment Agency

² Appendix 11.1 Feedstock Specification

analysis from other areas of the UK, within the peer reviewed model. The default profiles were reviewed and the Co-Collected trade waste profile was identified as the most appropriate for this project. Firstly, the Co-Collected trade waste profile was the closest in terms of calorific value (10.11MJ/kg) to the feedstock design point for the Mor Hafren facility (10.5MJ/kg)³. Secondly, both the WRATE profile and the proposed Mor Hafren feedstock comprise mix of C&I and residual MSW, and so the WRATE Co-Collected trade waste profile is the closest fit in terms of waste sources (which are otherwise purely MSW or C&I).

The only variation applied to the default composition assuming zero metals in the feedstock, as per the Feedstock specification. In this regard a conservative assumption (in carbon and methane-generating terms) was made to the default profile of removing metals and allocating that tonnage across three categories: combustibles, glass and organics. These were chosen to raise the CV to the anticipated level of 10.5MJ/kg, and the method is included in Appendix 2.

We believe that the waste composition applied in the model, as shown by the comparison against the Mor Hafren Feedstock specification in Appendix 1, represents a good match for fuel mix to be used by the Energy from Waste plant for modelling purposes, and for the landfill comparator.

Conclusion

The WRATE Co-Collected trade waste profile matches the performance requirements of the Mor Hafren feedstock specification very closely. The only variance between the two profiles are:

- The proportion of glass, stones, aggregate fraction, however this will be broadly technology neutral in carbon terms as there is negligible energy derived from the EfW process from this fraction of the feedstock and there is negligible gas impact from the landfill.
- The amount of sodium (Na) is higher than the feedstock specification, however this is not envisaged to impact on carbon performance of the EfW or the landfill
- There are several elements not reported by WRATE (Ti, Co, V), so it is not possible to compare these, however they would be envisaged to have a minimal impact on overall carbon performance from either the EfW or landfill

The WRATE Co-Collected trade waste profile was altered slightly to more closely match the Mor Hafren Feedstock specification (i.e. the Feedstock specification has a slightly higher CV than the WRATE waste composition). Where this change was made it would be expected to have the following effects in terms of carbon impact:

- Removal of metals – this would reduce the carbon performance of the EfW plant (as metals are recycled) and have no impact of the landfill [conservative assumption]
- Replaced metals tonnage with:-
 - Combustibles – increases CV of waste to more closely match feedstock specification [chosen as a mix of fossil and biogenic carbon]
 - Glass – non combustible, non gassing [neutral feedstock]
 - Organics – raises Moisture to closer to the Mor Hafren Feedstock specification [negligible impact on biogenic carbon and therefore on landfill gassing, limited benefit for EfW due to low CV and high moisture]

In summary, the modified WRATE Co-Collected trade waste profile used in the model is a very close match for the Mor Hafren Feedstock specification. The modifications made to the default WRATE waste profile were proportionate and overall conservative in terms of carbon benefit for the EfW project. We consider that the modified WRATE Co-Collected trade waste profile

³ Process Flow Diagram 'Cardiff CoGen PFD for 15MW net rev.1 20_9_2018'

used in the model reasonably represents the landfill methane-generating potential of the proposed Feedstock for the Mor Hafren facility.



Brian Harding
Technical Director
Industry & Buildings

Appendix 1: Detailed WRATE Waste composition Characteristics versus Feedstock specification and other evidence

Component	WRATE Waste Composition	Mor Hafren Facility Data	Data Source	Comments
Calorific Value (MJ/kg)	10.5004 MJ/kg	10.5 MJ/kg	Cardiff CoGen PFD for 15MW net rev.1 20_9_2018	Closely matches performance data
		10.494 MJ/kg	R1 Cardiff CoGen rev.1 20_9_2018	Closely matches performance data
		9 – 12 MJ/kg	Appendix 11.1 Table 1 Feedstock Specification Part A	Within performance range
Moisture Content (%)	28.7887%	<30%	Table 1 Feedstock Specification Part A	Within performance expectation
		30%	Cardiff CoGen PFD for 15MW net rev.1 20_9_2018	Mass balance provides maximum moisture value
Biomass content wt% (d)	63.99%	>45%	Table 1 Feedstock Specification Part A	Within performance expectation
Ash content (%)	18.3207%	<25%	Table 1 Feedstock Specification Part A	Within performance expectation
		25%	Cardiff CoGen PFD for 15MW net rev.1 20_9_2018	Mass balance provides maximum ash value
Feedstock size	[not specified in WRATE model]	n/a	Table 1 Feedstock Specification Part A	Not specified in model
Ferrous & non ferrous metals	0%	0%	Cardiff CoGen PFD for 15MW net rev.1 20_9_2018	As specified
		<3%	Table 1 Feedstock Specification Part A	Conservative position applied, the more metals the better the carbon performance (due to recycling of the metals from the ash)
Glass / Stones / Aggregate (%)	8.55% [glass + bricks, blocks plaster category of waste composition]	<3%	Table 1 Feedstock Specification Part A	Inconsistent with feedstock specification, however conservative assumption as glass / stones don't generate energy from the EFW and are non gassing from the landfill.

Component	WRATE Waste Composition	Mor Hafren Facility Data	Data Source	Comments
Fines (%)	1.79%	<5%	Table 1 Feedstock Specification Part A	Within performance expectation
Bulk density (kg/m ³)	[not specified in WRATE model]	150-350kg/m ³	Table 1 Feedstock Specification Part A	Not specified in model
Lower ash initial deformation temperature (°C)	[not specified in WRATE model]	>1000	Table 1 Feedstock Specification Part A	Not specified in model
Initial ash melting flow temp (°C)	[not specified in WRATE model]	<1300	Table 1 Feedstock Specification Part A	Not specified in model
Sulphur wt% (d)	0.1309%	<0.35%	Table 2 Feedstock Specification Part B	Within performance expectation
Nitrogen wt% (d)	0.6595%	<1.5%	Table 2 Feedstock Specification Part B	Within performance expectation
Lead wt% (d)	0.0253%	<0.05%	Table 2 Feedstock Specification Part B	Within performance expectation
Chlorine wt% (d)	0.9002%	<1.0%	Table 2 Feedstock Specification Part B	Within performance expectation
Zinc wt% (d)	0.0466%	<0.1%	Table 2 Feedstock Specification Part B	Within performance expectation
Sodium & Potassium wt% (d)	Sodium 0.9369% Potassium 0.3120%	<0.8%	Table 2 Feedstock Specification Part B	Sodium content exceeds specification – see comment below, Potassium within performance expectation
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V (total) mg/kg (d)	960	<1000	Table 2 Feedstock Specification Part B	Within performance ranges but no data provided from WRATE on Cobalt and Vanadium
Cd + Tl mg/kg (d)	3.4mg/kg Cd [Tl not reported in WRATE]	<10	Table 2 Feedstock Specification Part B	Cd within performance expectation Tl not reported in WRATE
Fluoride wt% (d)	0.017%	<0.0255%	Table 2 Feedstock Specification Part B	Within performance expectation
Hg mg/kg (d)	0.06749mg/kg	<2mg/kg	Table 2 Feedstock Specification Part B	Within performance expectation

Appendix 2: Waste composition modification

As described in the letter above, metals were removed from the feedstock and replaced with:

- Combustibles +2.5%
- Glass +0.74%
- Organics +0.79%

This has the effect of raising the CV to the design specification for the plant, raising from 10.11 MJ/kg to 10.5 MJ/kg.