Natural Resources Wales response to the Welsh Parliament Petitions Committee report:

P-06-1510 Direct NRW to revoke the environmental permit and ensure the closure of Enovert's, Hafod Landfill Site in Wrexham, January 2026

Recommendations for Natural Resources Wales

We welcome the Petition Committee's report and the opportunity to consider recommendations the committee has made for Natural Resource Wales.

Our response to each recommendation is laid out below.

Recommendation 2. *NRW should ensure that staff undertaking community 'sniff tests' to help assess odour nuisance have undergone appropriate training, and that training and competence to conduct these tests is kept under regular review*

Accept – already in place.

NRW staff who undertake odour investigations at our regulated sites will have started to progress or have progressed through the recognised odour pathway training. Within the pathway are four steps from introduction odour to advanced techniques in odour control. Odour sensitivity testing is also a requirement of officers who are investigating odour from our regulated sites. We undertake testing and recently carried out sessions with officers across Wales to raise awareness of the wide range of normal odour sensitivity found across the population and to assess where our officers' odour sensitivity falls within this range. NRW's Environmental Permit odour condition for landfills does not require "screened" or "calibrated" noses for odour inspection – we simply have to have a normal sense of smell. Testing is one of the ways we can demonstrate this. The test that we use is the threshold test provided by Odofin using n-butanol - Test procedure Threshold Test (ODOFIN Sniffin' Sticks) - MediSense | Smelltest.eu.

We do not have a defined retesting requirement in our H4 Natural Resources Wales / Horizontal guidance, however, we do advise regulatory officers on the likely causes of changes to a 'normal' persons sensitivity to odour, e.g. age, COVID, influenza and recommend retesting where necessary.

Whilst there is no requirement to regularly retest, we recognise the recommendation made by the Petitions Committee, and we will put systems in place to ensure officers maintain their capability as required.

Recommendation 3. *The Welsh Government should introduce mandatory automated odour monitoring at landfill sites. This is not something currently required by Natural Resources*

Wales, and the Welsh Government should ensure that regulators are sufficiently funded to facilitate this.

Accept – in principle pending further consideration.

NRW's odour guidance (How to comply) states that:
It is not possible to use instruments to measure odour in ambient air directly. However, very occasionally it may be possible to undertake surrogate measurements which are indicative of odours. This may be through direct measurement of chemicals which are themselves odorous, such as hydrogen sulphide.

BSEN 13725 - Dynamic Dilution Olfactometry is the method for measuring odour, but this is specific to point source emissions where grab samples of source emissions are subsequently diluted to the odour threshold in a laboratory setting. This method is not relevant to ambient odour monitoring.

This recommendation needs some consideration as to what we would test for (e.g. methane, H_2S, CS2, Ammonia), should we have the ability to introduce ambient automated odour monitoring. There are also considerations needed around enforceability of any limits included in Environmental Permits, as it would be challenging to prove definitively that the source of the odour (H_2S) would be from the landfill, as other sources also contribute to background levels. Hafod landfill is in close proximity to other potential sources of odour, such as agricultural and industrial activity, as well as being in close proximity to roads.

We can request this testing from the operator if we have substantiated odour and attributed it to the landfill. In the case of Hafod landfill, Enovert (the operator) has set up AQMesh monitoring pods and used the consultants Geotechnology to interpret results. Several of the petitioners questioned the accuracy and validity of the data on the basis that the work was completed on behalf of the operator.

We will consider this recommendation further, however, the mechanics around introducing mandatory automated odour monitoring at landfill sites is complex. We would need to consider NRWs remit and the resources needed to manage and interpret such results captured in this manner, as well as the enforceability of the results. We also need to consider the roles and responsibilities with other organisations, e.g. Local Authority, Public Health Wales, should Welsh Government mandate that ambient air monitoring for Hydrogen sulphide in Environmental Permits or via other regulatory frameworks.

Recommendation 5. *Natural Resources Wales should consider whether criteria for measuring hydrogen sulphide (H_2S) levels, causing "rotten egg" odour, should be included in environmental permit conditions, and report back to Welsh Ministers on whether more work should be commissioned on the appropriate measurement of H_2S thresholds.*

Reject – but recognise the value in undertaking certain types of monitoring.

Our view is that regulatory compliance to mitigate against H_2S production at landfills should be focussed on landfill site management, such as waste inputs and types i.e. control of wastes containing gypsum, or other wastes that are likely to produce H_2S in a landfill environment, and in maintaining small working areas. These aspects are already within our regulatory control via the Environmental Permit.

We would exercise caution in including *H_2S* limits in Environmental Permits, due to the difficulties in distinguishing the source of *H_2S* from other sources in the vicinity of the landfill, e.g. other industrial or agricultural. The Environment Agency's new odour guidance, which NRW has adopted, states:
Hydrogen sulphide levels are sometimes used as a surrogate for odour when conducting ambient air quality monitoring, but there are limitations to this approach.

The World Health Organisation (WHO) air quality guidelines for Europe states:
On the basis of the scientific literature, it is not possible to state a specific concentration of hydrogen sulfide at which odour nuisance starts to appear. Half-hour average concentrations exceeding 7 µg/m^3 are likely to produce substantial complaints among persons exposed. A reduction in the concentration of hydrogen sulfide does not guarantee a substantial reduction of the odour nuisance, since hydrogen sulfide in many effluents provides only a small contribution to the odour strength of the total effluent.

The qualifications in this WHO statement are important. The concentration of hydrogen sulphide is only likely to be relevant where it is the dominant odorous chemical. Otherwise, hydrogen sulphide monitoring on its own may severely underestimate levels of odour pollution. This potential limitation applies to monitoring for any surrogate chemicals which might be measured in ambient air. There have been concerns raised on the acceptability of the World Health Organisation's guidance on H_2S in relation to Walley's Quarry Landfill in England. It has been questioned due to significant discrepancies between guideline levels and the "lived experience" of the local community. While monitored levels often remained below the WHO 24-hour health guideline, they frequently exceeded the WHO odour annoyance guideline, leading to widespread complaints.

We do, however, monitor H_2S at some landfills where there is an identified risk. In the case of Hafod Landfill, H_2S monitoring is reported quarterly by the operator, as required under Table S3.8 in their Environmental Permit. There is a requirement to report the levels, but no compliance limit set. This reporting also forms part of the operator's Odour Management Plan, which stipulates that they will undertake ad-hoc monitoring as required. Measurements are provided every 6 months from:

- In waste gas monitoring boreholes or sealed leachate wells or sacrificial gas extraction system in cells or phases which have no active gas extraction system.
- Gas collection system at all well control valves, manifolds (if applicable) and strategic points on gas system.

In conclusion, it would be very difficult to introduce enforceable H_2S thresholds for ambient air into landfill Environmental Permits as there are other potential sources of odour emissions in the vicinity of the landfill. Our view is that we already have the regulatory controls and tools via the landfill permit to control waste acceptance which require operators to manage their landfills appropriately to reduce the risk of H_2S being produced at the site.

For information, Welsh Government have allocated funding to NRW to purchase an Optical Gas Imaging Camera for onsite investigations. Although this won't measure H_2S, we can use this equipment to measure other odour surrogate chemicals, including methane. This will help

us focus our regulatory compliance on the landfill which are giving rise to emissions and can lead to odour issues.

Recommendation 6. *The Welsh Government should seek assurances from Natural Resources Wales that the measures in place at landfill sites in Wales are adequate to ensure they are climate resilient during and beyond their operational lifetimes.*

Accept – already in place.

Our regulation of the site requires operators to have appropriate management plans in place to address the risk of off-site impacts from landfilling activities. These plans require the operator to consider the potential impacts arising from climate change. NRW assess the suitability of these plans. We have, reviewed Enovert's climate change risk assessment which we are satisfied meets regulatory requirements.

We have also required operators of installations regulated under the Environmental Permitting Regulations to undertake climate change adaptation questionnaires, to provide us with information of the operators climate change adaptation preparedness. Enovert identified a number of significant hazards and consequences of climate change and considered the control measures to mitigate the impacts for Hafod landfill.

In summary, Enovert's response to the questionnaire for Hafod Landfill raised the following considerations:

- Higher temperatures and potentially drier summers could result in an increase in dust and odour, cracking of cover soils and caps, increased erosion.
- The potential for an increase in "hot waste" and resultant fire risk.
- Higher temperatures may also result in failure of infrastructure such as pumps, engines, IT equipment and control of critical equipment.
- Lower temperatures and freezing events.
- The hazards and effects of increased extreme rainfall events, which could lead to flooding, erosion and instability of cover and waste mass, and increased infiltration and associated leachate generation and contaminated surface water discharge.
- Increased wet waste in operational areas generating landfill gas and hydrogen sulphide was also identified.
- Variance (increases or decreases) in water tables and local river flow and the impact on discharge consents.

Given the uncertainty of the potential future climatic impacts, NRW are satisfied that the operator currently has adequately considered the appropriate control measures, and should ensure are reflected in their management plans to mitigate the identified potential hazardous and effects of climate change. Operators are required to keeps these plans up to date and under regular review, reflecting any changes in operations.

Recommendation 7. *Natural Resources Wales should investigate whether a connection exists between rainfall and hydrogen sulphide (H_2S) production at Hafod landfill site - using the*

monitoring data, and available weather data, not just complaint numbers. If a connection is found, it must account for this in the regulatory approach

Accept – already in place.

Existing evidence shows that there is a demonstrable link between rainfall at landfills and the production of Hydrogen Sulphide, with increased rain entering a landfill reacting with the sulphur bearing materials with a landfill. This will be the case at Hafod landfill, as it is with many other landfills. It should however be noted that the links between rainfall and Hydrogen Sulphide production won't present in short term spikes in gas production immediately following rainfall events. Gas production will increase over a longer period as infiltration reacts with wastes in the landfill.

This is why it is important that the operator undertakes waste acceptance checks and takes steps to ensure that the exposed areas of the landfill are minimised as much as possible. This is done by installing temporary or permanent capping of the waste mass as soon as possible after waste has deposited, and by minimising the size of the active tipping area as much as possible. These measures are already detailed in regulatory guidance and Industry Codes of Practice, which detail the standards operators must adhere to, in order to achieve compliance with their permit requirements.

Recent site audits at Hafod landfill have highlighted areas where additional capping could be installed, and operator has been working to install this. The operator has also improved operations to ensure the size of the active tipping face is as small as possible, which reduces the risk of fugitive emissions from active areas. We have also recently received updated Landfill Gas and Leachate Management action plans for Hafod landfill, which include necessary technical measures for minimising water infiltration into the waste mass, and for the collection and removal of landfill gas and leachate.

We could undertake a specific study at Hafod landfill in response to this recommendation, should funding be available, however, we do not consider this necessary as the link between rainfall and elevated H_2S production is already well documented and there are existing regulatory controls via the Environmental Permit and statutory guidance to mitigate against this.