Annex (iv) – SSSI Assessment Form

SSSI Assessment for permit/licence and deployment applications	Cyfoeth Naturiol Cymru Natural Resources Wales
To be completed by Permitting Officers for any applications for a permission which Natural Resources Wales has considered under S28I duty to notify SNCB and take their advice into account. This applies to all proposed permissions within a SSSI, and to operations outside the SSSI boundary which are likely to damage its special features. NRW as a Section 28G authority has, when exercising its functions, a general duty to take reasonable steps, consistent with the proper exercise of its functions, to further the conservation and enhancement of the flora, fauna or geological or physiological features by reason of which the site is of special interest' Part 1 – SSSI Assessment Part 2 – Formal notification to SNCB (to be completed if part 1 assessment concludes likely damage, not likely to damage because of conditions or you cannot conclude no likely damage) Part 3 – Decision	

Part 1 – SSSI Assessment

1. Permitting officer/team	Victoria Seller Lead Specialist, Installations and RSR Permitting Team
2. Permit application reference and site name	New bespoke permit application – Hyperscale Data Centre Application reference: PAN-026552
3. a. SSSI name(s) b. location	a. Gwent Levels – St. Brides b. Newport, South Wales

c. NRW Operational Area/Environment Team	c. Blaenau Gwent, Caerphilly and Newport
4. Brief description of proposal	The Applicant, MSFT MCIO Limited, has applied for a new bespoke permit that allows them to operate 31 emergency back-up generators at the proposed new Hyperscale Data Centre campus in Duffryn, Newport. The purpose of the generators is to supply electricity to the Data Centre in the event of a major power outage or black-out. The total rated thermal input of the generators is 236MW. The generators will operate via the combustion of diesel but have the capacity to be converted to run on hydrotreated vegetable oil (HVO) if required. The generators will be comprised of 28 emergency backup diesel generators, two administrative building generators and one water treatment plant generator. The permit relates only to this combustion activity, not the Data Centre operation itself. The generators will only ever operate during two scenarios: (i) for the purpose of routine testing and maintenance, and (ii) if a major power outage or black-out occurs that interrupts the electricity supply to the Data Centre. The generators are all fitted with selective catalytic reduction (SCR) abatement systems to facilitate the removal of oxides of nitrogen from the exhaust gases. Each generator will operate for less than 500 hours per year and will be considered Limited Operating Hours Medium Combustion Plant (MCP) and exempt from the emission limit values within Schedule 25A of EPR. The routine testing and maintenance regime is as follows: 1. Monthly test – 15 minutes, 8 times per year (included in air dispersion modelling as 30% engine load); 2. Quarterly test – 30 minutes, 3 times per year (included in air dispersion modelling as 70% engine load); 3. Annual test – one hour, once per year (included in air dispersion modelling as 100% engine load); 4. Annual PIT test – 90 minutes, once per year (included in air dispersion modelling as 60% engine load);

	5. Unit Substation (USS) Switchgear (Quinquennial) test – 90 minutes, once every five years (included in air dispersion modelling as 60% engine load); and 6. Uninterruptable Power Supply (UPM) Switchgear (Quinquennial) test – 90 minutes, once every five years (included in air dispersion modelling as 60% engine load). All generators will follow the same testing regime. The emergency power outage scenarios are: • 1 hour; and • 72 hours. Other than this, apart from very minimal additional testing should there be any faults unplanned maintenance (which will be short duration) the engines will remain off, and retained for emergency use only. Emergency use is considered to be very unlikely and there are extensive measures in place (in line with Best Available Techniques for the sector) to minimise the likelihood and duration of any national grid power failure (e.g. high voltage (HV) connection direct to “super grid” capable of powering the entire site, use of UPS (uninterruptable power supplies), etc.). Should emergency operation be required, generators would operate in emergency mode. The operator has modelled the impact of 1hr and 72hr emergency operation and has assumed that during these events, all engines would operate simultaneously and at 60% loading. These emergency operation scenarios are in line with Environment Agendy guidance on Data Centres[1], which NRW is signed up to. If a permit is granted, these time and loading capacity restrictions will be included in the permit.

[1] Data Centre FAQ Headline Approach. DRAFT version 21.0 to TeckUK for Discussion 15/11/22.

	Emergency operation would be a significant event for the site, and for the National Grid network, and would be immediately reported to NRW and managed as necessary as an incident. The generators will normally run on low sulphur conventional diesel, but Hydrotreated Vegetable Oil (HVO) may be used as a secondary backup fuel. They will be fitted with Selective Catalytic Reduction (SCR) for NO_x emissions abatement. Each generator will operate for less than 500 hours per year and will be considered Limited Operating Hours Medium Combustion Plant (MCP) and exempt from the emission limit values within Schedule 25A of EPR. The emissions in the exhaust gases that area relevant to this HRA are: • Oxides of nitrogen (NO_x as NO_2) • Particulate matter (PM) • Sulphur Dioxide (SO_2) • Ammonia (NH_3) The installation is with close vicinity (300m at its closest points) to the Gwent Levels – St Brides SSSI so a SSSI assessment is required.

5. What aspects of the proposed permission are likely to damage the SSSI features of special interest?

The following activities are likely to cause damage:

The following SSSI(s) features and potential impacts have been considered to assess the likelihood of damage:
Gwent Levels – St Brides SSSI is designated an an example of one of the most extensive areas of reclaimed pasture in the UK. The reens are rich in plant species and communities and many nationally rare or notable species are present. Further information on the sites features can be found in the Gwent Level – St Brides SSSI Citation[2]. **The following activities are likely to cause damage:** The installation is located approximately 300m from the site and hence the activity is not likely to damage any of the flora, fauna or geological or physiological features which are of special interest from disturbance, habitat loss or physical damage which are typically associated with direct activity within a protected site boundary. The only emissions to water will be uncontaminated surface water run-off. All potentially polluting hazardous substances will be suitably stored and contained to effectively minimise the risk of accidental release to water. Therefore the activity is not likely to damage any of the flora, fauna or geological or physiological features which are of special interest as a result of changes to any watercourses (flow regimes, thermal regimes, siltation, etc.). There are emissions to air associated with the proposal. The emissions in the exhaust gas will comprise of: • Oxides of nitrogen (NO_x as NO_2) • Particulate matter (PM) • Sulphur Dioxide (SO_2) • Ammonia (NH_3) Selective Catalytic Reduction (SCR) abatement is proposed (which will use AdBlue) to reduce NO_x emissions which may lead to emissions of ammonia (NH_3) should “ammonia slip” occur. The applicant has provided a detailed assessment of NH_3 impacts, using detailed modelling to determine the significance of the NH_3 emissions and deposition against the relevant environmental standards in line with relevant guidance[3]. Impacts of testing and emergency usage have been assessed. We are in agreement of this approach in this

[2] Gwent Levels – St. Brides SSSI Citation
[3] Air emissions risk assessment for your environmental permit - GOV.UK

instance and conclude there is no risk of likelihood of damage to the site form NH_3 emissions from this proposal for both emergency and testing scenarios.

Please refer to the air quality modelling report for a full description of modelling approach (see PAN-206552 on DMS). We are in agreement with this approach. The assumptions underpinning the model have been checked and are reasonably precautionary. The way in which the applicant used dispersion models, its selection of input data, use of background data and the assumptions it made have been reviewed by Natural Resources Wales modelling specialists to establish the robustness of the applicant's air impact assessment. These checks indicated that we are in general agreement with the modelling results and as such, they have been used to support this SSSI assessment.

Sulphur Dioxide

The applicant has considered the impact of SO_2 emissions in their application. They have screened out SO_2 emissions from requiring detailed assessment (modelling) on the basis that ultra-low sulphur diesel will be used (or HVO which is lower in sulphur again). They have instead used the modelled results for NO_x and the sulphur content of the fuel to calculate / demonstrate low sulphur emissions (e.g. 0.110 $\mu g/m^3$ for a single engine and 2.05 $\mu g/m^3$ for all engines). We are in agreement of this approach in this instance when also considering the low operational hours of the engines (both planned and emergency operation). We do not anticipate there to be a likelihood of damage to the site from SO_2 emissions as a result of the proposal. This is the case for both the testing and emergency operation scenarios.

Particulate Matter

The engines will emit small amounts of particulate matter (PM). While particulate matter does not have a Critical Level or Load set for the protection of vegetation and ecosystems, it still has the potential to contribute to smothering of vegetation from airborne fallout. PM_{10} and $PM_{2.5}$ are deposited slowly but may travel 1000m or more. However, concentrations decrease rapidly on moving away from the source, due to dispersion and dilution. The IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning[4] document indicates that impacts on sites that are greater than 1km from the source of minerals quarries are negligible and do not need to be assessed.

The applicant has considered the impact of PM in their application. They have completed a screening exercise using modelled data that has assumed that the site will run all the engines at the same time at 100% load. This in practice is not how the testing regime is scheduled, which comprises six scenarios that are mutually exclusive, based on a 60% operating load. The applicant's assessment therefore represents

[4] Guidance on the Assessment of Mineral Dust Impacts for Planning. May 2016 (v1.1)

an overestimation of the impact. This is also an unlikely case for an emergency scenario as not all engines would be expected to run continuously for 24 hours.
The applicant has presented process contributions (PCs) for $PM_{2.5}$ and PM_{10} averaged over a 24-hour period, and compared them with the Daily Average Air Quality Standard (AQS) for human health (50 µg/m^3, not to be exceeded more than 35 times a year).

The maximum PC at any of the modelled receptors (which, for human health, are located closer to the site than Gwent Levels - St. Brides SSSI) is 10.9 µg/m^3, and the Predicted Environmental Concentration (PEC) 40.5 µg/m^3, which is 83% of the AQS.

For the the following reasons, we consider that the screening exercise presents a conservative assessment of the impact of PM on the SSSI:

- The assessment is based on 100% load operation of all engines simultaneously. In practice, the testing regime will be limited (via any permit granted) to 60% load operation with no overlapping operation of the testing scenerarios. Emergency operation for a continuous 24 hour period is also extremely unlikely;
- The assessment shows that the maximum PC at any of the human health receptors - which are all located closer to the site that the SSSI – does not exceed the short-term AQS for PM_{10}. Concentrations at the SSSI are therefore likely to be even lower;
- An exceedance of the AQS only occurs when the PEC is >100% of the AQS on 35 (or more) occasions per year;
- $PM_{2.5}$ is a fraction of PM_{10}, and therefore concentrations of this pollutant are likely to be even lower than that predicted for PM_{10}; and
- Although the SSSI is within 1km of the stacks (300m), which is below the threshold for detailed assessment given in the IAQM mineral guidance, it is relevant that the mineral guidance is related to dust emissions from quarries. Quarry dust is likely to be emitted in greater concentrations and contain coarser dust fractions when compared to the emission of fine particulate matter from the diesel combustion units. Consequently, the potential for damage from smothering is much lower from combustion units, given the small mass concentration and size fraction of particulate matter.

We therefore consider that in this case there is no realistic likelihood of impact.

The principle emissions of concern is NO_x, and, to a lesser extent, ammonia (NH_3). Emissions of these substances could could damange features via toxic contamination from airborne concentrations and nutrient enrichment and/or acidification from deposition.

The following operations requiring consent (ORC) is relevant for consideration for this assessment:
“7 Dumping, spreading or discharging of any waste materials.”
This ORC is relevant for the spreading of air pollutants described above.

The following SSSI(s) features and potential impacts have been considered to assess the likelihood of damage:

The site's features include standing water, an assembledge of aquatic and marginal plant species, and nationally scarce vascular plants species which may be sensitive to the impacts of NO_x emissions.

The applicant has provided a detailed assessment of NO_x impacts, using detailed modelling to determine the significance of the NO_x emissions and deposition. Impacts of testing and emergency usage have been assessed.

The air quality modelled has calculated process contributions (PC) and predicted environmental concentrations (PEC) at locations within the Gwent Levels - St. Brides SSSI and compared them against the relavent environmental standard to predict if impacts are to be significant using the accepted guidance on determining significance of air quality modelling results. Impacts can generally be screened out as insignificant where they are under 10% for short term impacts and 1% for long term impacts (please refer to guidance for further information).

Ammonia (NH_3)

Testing
Toxic contamination from airborne NH_3 – long term assessment

The APIS website[5] indicates that the majority of habitats and species of interest at the Gwent Levels – St. Brides SSSI are not sensitive to ammonia contamination. One – Grazing levels invertebrate assemblage – has an associated ammonia critical level of 3 µg/m^3. The applicant assessed emissions of NH_3 against the long term critical level of 1 µg/m^3. This is the lower critical level for ammonia and therefore we consider this approach to be conservative. The maximum long term PC from the cumulative impact of all planned tests is 0.00192 µg/m^3, which is less than 1% of the critical level. Therefore, in accordance with the relevant guidance, **long term impacts can be considered insignificant.**

Emergency Operation – 1 hour
Toxic contamination from NH_3 – long term assessment

[5] APIS

Emissions of NH_3 were assessed against the long term critical level of 1 µg/m^3. As discussed, NRW are in agreement with the critical level used. The maximum long term PC 0.000234 µg/m^3 was predicted to be less than 1% of the critical level. Therefore, in accordance with the relevant guidance, **long term impacts can be considered insignificant**.

Emergency operation – 72 hour
Toxic contamination from NH_3 – long term assessment

Emissions of NH_3 were assessed against the long term critical level of 1 µg/m^3. As discussed, NRW are in agreement with the critical level used. The maximum long term PC (0.0169 µg/m^3) was predicted to be less than 1% of the critical level. Therefore, in accordance with the relevant guidance, **long term impacts can be considered insignificant**.

Oxides of Nitrogen (NO_x)

Testing
Toxic contamination from airborne NO_x – short term assessment

Potential impact of short-term (daily) NO_x emissions on the Gwent Levels – St. Brides SSSI has been based upon the anticipated worst-case scenario of the quinquennial test, as it represents worst-case impact in any 24-hour period during routine testing. As for NH_3, the applicant has based their assessment of short-term (daily) NO_x upon the anticipated total cumulative impacts of all tests undertaken as described above. We consider this methodology to be appropriate.

Emissions of NO_x have been assessed against a short term (daily) critical level of 200 micrograms per cubic metre (µg/m^3). Whilst the standard critical level for NO_x for protected sites is usually 75 µg/m^3, 200 µg/m^3 has been used where ozone is below the AOT critical level and sulphur dioxide is below the critical level of 10 µg/m^3. This approach is line with guidance and NRW are in agreement with the critical level used.

The maximum short-term Process Contribution (PC) (20.9 µg/m^3) was predicted to be greater than 10% (10.5%) of the critical level. Therefore, in accordance with the relevant guidance, **short-term impacts cannot be considered insignificant**.

The maximum short term PEC was calculated to be 57.7 µg/m^3. This is 29% of the critical level which indicates there is no risk of the critical level being exceeded during testing.

Toxic contamination from airborne NO_x – long term assessment

Long-term assessment (annual) of testing impacts included an accumulation of the impact from all planned testing regimes. Emissions of NO_x were assessed against the long term critical level of 30 µg/m^3. As discussed, NRW are in agreement with the critical level used. The maximum long-term PC (0.0525 µg/m^3) was predicted to be less than 1% of the critical level. Therefore, in accordance with the relevant guidance, long-term impacts can be considered insignificant.

Nutrient enrichment from NO_x deposition

At the time of this assessment, there were no nutrient nitrogen critical loads listed on APIS for the Gwent Levels – St. Brides SSSI. We therefore consider the applicant's use of 3 kgN/ha/yr to be appropriate and conservative. The maximum long-term PC (0.0153 µg/m^3) was predicted to be less than 1% of the critical level. Therefore, in accordance with the relevant guidance, long-term impacts can be considered insignificant.

In addition, in most cases where there are no critical loads listed for nutrient nitrogen deposite, impacts can be screened out on the basis of an assumption of no sensitivity or lack of known sensitivity. Therefore, in accordance with the relevant guidance **impacts can be considered insignificant**.

Acidification from acid deposition

At the time of this assessment, there were no acidity critical loads listed on APIS for the Gwent Levels – St. Brides SSSI. We therefore consider the applicant's use of:

CLmaxS: 0.28 keq/ha/yr
CLminN: 0.321 keq/ha/yr
CLmaxN: 0.601 keq/ha/yr

to be appropriate. The maximum long-term PC (0.00109 µg/m^3) was predicted to be less than 1% of the critical level. Therefore, in accordance with the relevant guidance, long-term impacts can be considered insignificant.

In most cases where there are no critical loads listed for acidity, acidity impacts can be screened out on the basis of an assumption of no sensitivity or lack of known sensitivity. Therefore, in accordance with the relevant guidance **impacts can be considered insignificant**.

Emergency Operation – 1 hour
Toxic contamination from NO_x – short term assessment

Emissions of NO_x were assessed against a short term critical level of 200 µg/m^3. As discussed, this approach is line with guidance and NRW are in agreement with the critical level used.

The maximum short term PC (14 µg/m^3) was predicted to be less than 10% of the short term critical level. Therefore, in accordance with the relevant guidance, **short-term impacts can be considered insignificant**.

Toxic contamination from NO_x – long term assessment

Emissions of NO_x were assessed against the long term critical level of 30 µg/m^3. As discussed, NRW are in agreement with the critical level used. The maximum long term PC (0.00502 µg/m^3) was predicted to be less than 1% of the critical level. Therefore, in accordance with the relevant guidance, **long-term impacts can be considered insignificant**.

Nutrient enrichment from NO_x deposition

At the time of this assessment, there were no nutrient nitrogen critical loads listed on APIS for the Gwent Levels – St. Brides SSSI. We therefore consider the applicant's use of 3 kgN/ha/yr to be appropriate and conservative. The maximum long-term PC (0.00172 µg/m^3) was predicted to be less than 1% of the critical level. Therefore, in accordance with the relevant guidance, long-term impacts can be considered insignificant.

In addition, in most cases where there are no critical loads listed for nutrient nitrogen deposite, impacts can be screened out on the basis of an assumption of no sensitivity or lack of known sensitivity. Therefore, in accordance with the relevant guidance **impacts can be considered insignificant**.

Acidification from acid deposition

At the time of this assessment, there were no acidity critical loads listed on APIS for the Gwent Levels – St. Brides SSSI. We therefore consider the applicant's use of:

CLmaxS: 0.28 keq/ha/yr
CLminN: 0.321 keq/ha/yr
CLmaxN: 0.601 keq/ha/yr

to be appropriate. The maximum long-term PC (0.000123 µg/m^3) was predicted to be less than 1% of the critical level. Therefore, in accordance with the relevant guidance, long-term impacts can be considered insignificant.

In addition, in most cases where there are no critical loads listed for acidity, acidity impacts can be screened out on the basis of an assumption of no sensitivity or lack of known sensitivity. Therefore, in accordance with the relevant guidance **impacts can be considered insignificant**.

Emergency operation – 72 hour
Toxic contamination from NO_x – short term assessment

Emissions of NO_x were assessed against a short term critical level of 200 µg/m^3. As discussed, this approach is line with guidance and NRW are in agreement with the critical level used.

The maximum short term PC (335 µg/m^3) was predicted to be more than 167% (17.95%). Therefore, in accordance with the relevant guidance, **impacts cannot be screened out as insignificant**.

The maximum short term PEC was calculated to be 371.6 µg/m^3. This is 186% of the critical level which indicates there is a risk of the critical level being significantly exceeded during a 72 hour emergency outage.

Toxic contamination from NO_x – long term assessment

Emissions of NO_x were assessed against the long term critical level of 30 µg/m^3. As discussed, NRW are in agreement with the critical level used.

The maximum long term PC (0.361 µg/m^3) was predicted to be greater than 1% (1.2%) of the critical level. Therefore, in accordance with the relevant guidance, **long term impacts of air pollution from NO_x cannot be considered insignificant**.

The maximum short term PEC was calculated to be 18.7 µg/m^3. This is 62% of the critical level which indicates there is no risk of the critical level being exceeded during a 72 hour emergency outage.

Nutrient enrichment from NO_x deposition

At the time of this assessment, there were no nutrient nitrogen critical loads listed on APIS for the Gwent Levels – St. Brides SSSI. We therefore consider the applicant's use of 3 kgN/ha/yr to be appropriate. The maximum long-term PC (0.124 µg/m^3) was predicted to be greater than 1% (4.1%) of the critical load. Therefore, in accordance with the relevant guidance, **long-term impacts of air pollution from nutrient nitrogen deposition cannot be considered insignificant.**

However, in most cases where there are no critical loads listed for nutrient nitrogen deposition, impacts can be screened out on the basis of an assumption of no sensitivity or lack of known sensitivity. Therefore, in accordance with the relevant guidance **impacts can be considered insignificant**.

Acidification from acid deposition

At the time of this assessment, there were no acidity critical loads listed on APIS for the Gwent Levels – St. Brides SSSI. We therefore consider the applicant's use of:

CLmaxS: 0.28 keq/ha/yr
CLminN: 0.321 keq/ha/yr
CLmaxN: 0.601 keq/ha/yr

to be appropriate. The maximum long-term PC (0.00883 µg/m^3) was predicted to be less than 1% of the critical level. Therefore, in accordance with the relevant guidance, long-term impacts can be considered insignificant.

In addition, in most cases where there are no critical loads listed for acidity, acidity impacts can be screened out on the basis of an assumption of no sensitivity or lack of known sensitivity.. Therefore, in accordance with the relevant guidance **impacts can be considered insignificant**.

We do not normally assess the impact of unexpected emergency emissions and an appropriate approach is needed for back-up engines. Emergency operation of all the engines to provide back-up power is a very rare event. The National Grid reliability for the high voltage transmission system to which the data centre will be connected is >99.999%.

There are no standard permitting criteria for assessing risk from possible, but unlikely emergency events. Given that a long term air emission level is regarded as insignificant if it is less than 1% of the critical level, it is considered that a less than 1% likelihood of exceedance in an emergency is similarly an insignificant risk to the protected site. If granted, conditions in the permit will limit the number of hours of emergency operation, and permit conditions would be reviewed if the likelihood of emergency operation substantially changed. This assessment is considering the impacts of a 72 hour outage. This is a recent requirement which has not been assessed during previous applications and is based on the most recent guidance for data centres.

Any permit granted will include additional controls to protect the environment in the event of emergency operation. These will include an Air Quality Management Plan (AQMP) which requires the operator to notify NRW in the event of any emergency operation. The limits of the permitted activity specifically state that emergency generation shall cease or be reduced if there is credible information that there may an immediate significant adverse effect on the environment (detailed in the permit's Table S1.1).

For these reasons, **we do not consider there to be a risk of likely damage any of the flora, fauna or geological or physiological features which are of special interest**.

6. Summary of any informal advice received from internal experts (if required and including pre-app advice)	
7. Recommendation	The proposed permission is **not likely to damage** any of the flora, fauna or geological or physiological features which are of special interest

	• Impacts from the testing of the engines have been screened out as insignificant, with the exception of short-term (daily) NO_x. This part of the assessment is of most importance as it is certain to occur • The testing PEC for short-term (daily) NO_x is 29% of the relevant AQS, meaning that and exceedance is unlikely to occur • Impacts from the use of the emergency generators for 1 hour have been shown to not result in a breach of the revlevent environmental standards. • Impacts from the use of the emergency generators for 72 hours have been shown to potentially result in breaches of the relevant environmental standards. However, the use of the engines for back up power is considered an extremely rare event, especially for 72 hours and the modelling results are based on worst case metrological conditions. Furthermore there are permitting controls in place, which will not be changed as part of the variation, to protect the environment in the event of an outage.
8. Signature and date assessment made	Victoria Seller, 14/11/2025
9. Officers name and job title	Victoria Seller, Lead Specialist, Installations and RSR Permitting