ADDENDUM

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Date: 22/08/2025 **From:** Nalisha Parmar (RWDI)

To: Thais Delboni (Environmental Health – Horsham District Council)

CC: Ryan Webb (RWDI), William McKay (Lovell), Matthew Brooksbank (Nexus Planning)

RWDI Ref: #2509761_ADD_Rev_01

Subject: Former Novartis Site – Comments from Environmental Health Department

INTRODUCTION

This technical report has been prepared to address comments made by the Environmental Protection Officer (EPO), Thais Delboni, from the Environmental Health department for the application at the Former Novartis Site on 14th May 2025 (Ref: DC/25/0629).

A meeting was held with the EPO on 7th July 2025 at 15:00 to discuss these comments and outline a way forward to proceed with this application. These conversations have been detailed below in relation to the meeting, alongside rationale for each comment/query posed.

The EPO comments and queries are detailed in blue ink, where RWDI's response is provided in black ink.

DAMAGE COST CALCULATION

Comment 1: *I tried to replicate the damage-cost calculations using the same inputs you provided in the Air Quality Assessment but got higher outputs for NOx and $PM_{2.5}$ than you reported.*

Please could you check your results, and include a detailed breakdown of your workings as supporting evidence?

The annual emission figures should then be entered into the Damage Cost Toolkit:

- *Start year = 2027 (opening year)*
- *End year = 2031*
- *Price base year = 2025 (baseline year for the project appraisal)*

Response 1: It is noted that the time taken to prepare the report, this section was not updated to reflect the submission date and proposed opening year. As a result, the damage cost assessment has been reassessed to take this into consideration.

Emission Factor Toolkit Input

Emissions Factor Toolkit version 12.1 has been used for this assessment, as this is the version available at time of submission of the application.

The trip rate (vehicle trips per day) for the development was provided by Paul Basham Associated that concluded there would be 1,125 trips produced by the proposed development with 2% HDVs. The selected area is 'England (not London)' and the selected road type is 'Urban (Not London)'. Inputs of speed and link length are selected as per the Sussex guidance, as follows:

- Traffic Flow: 1125
- % HDV: 2
- Speed (kph): 50
- No of hours: 24
- Link Length (km): 10

Damage Cost Appraisal Toolkit Input

The length of the appraisal period is five years, starting in 2027 (proposed opening year) and ending in 2031. The selected pollutant sector is 'Road Transport Urban Medium' for both NO_X and $PM_{2.5}$. The central present value outputs for both pollutants are presented for the appraisal period and are added together to calculate the total five-year damage cost value is presented.

Damage Cost

The five-year air quality damage cost of the development was calculated to be £12,409. The calculation of the five-year damage cost is presented below in Table 1.

The five-year damage cost represents the minimum sum of money that must be spent on the implementation of practical mitigation measures to aid in off-setting adverse air quality impacts from the development, in line with the Sussex guidance.

Table 1: Five-Year Air Quality Damage Cost Calculation

Trip Rate for Development (vehicle trips per day)		1,125	
Pollutant		NO_X	$PM_{2.5}$
Emissions (tonnes/annum)	2025	0.1604	0.0206
	2026	0.1395	0.0205
	2027	0.1204	0.0203
	2028	0.1033	0.0202
	2029	0.0887	0.0201
Five-year (Central Present Value) Damage Cost (£)		5,733	6,676
Five-year Damage Cost NO_X + $PM_{2.5}$ (£)		**12,409**	

AIR QUALITY MITIGATION PLAN

Comment 2: *Sussex Air (2021) Air Quality and Emissions Mitigation Guidance for Sussex takes a low-emission strategies' approach to avoid health impacts of cumulative development, by seeking to mitigate or offset emissions from the additional traffic and buildings. It is recommended that the emission mitigation statement contain itemised costing for each proposed mitigation option and total value of all proposed emissions' mitigation. This should be equal to the value from Emissions calculation and total calculated value of emissions' health damage cost. Sussex Air quality guidance aims to avoid the duplication of measures that would normally be required through other regimes.*

Response 2: To offset the Damage Cost value of £12,409, the following mitigation measure has been agreed with the client to be implemented.

A one-off £150 travel voucher will be provided to each household for either:

- A contribution towards a bus ticket;
- Reimbursement on rail travel;
- Cycle voucher; or
- Cycle training through West Sussex County Council.

This will promote sustainable forms of transport in the surrounding area.

There are 159 apartments and 47 residential houses planned as part of the development. This equates to 206 units in total. Therefore, the cost to this mitigation measure will be £30,900.

This value exceeds the damage cost value and therefore offsets it.

Additionally, there are also proposals to include a permissive cycle route through the site, which would tie into the adjacent application. The purpose is to provide a more favourable route that the existing Wimblehurst Road/Parsonage Road route and avoiding the North Heath Lane/Parsonage Road/Wimblehurst Road roundabout. This is expected to promote more sustainable and healthier forms of transport.

There are also conversations regarding likely contributions towards wider off-site pedestrian improvements including at the North Heath Lane/Parsonage Road/Wimblehurst Road roundabout and Richmond Road/Wimblehurst Road junction. This will allow pedestrians to utilise pathways surrounding the site.

The latter two measurements are still under discussion with the council and have not been quantified, however, will add to transport improvements within the area. Overall, the damage cost assessment can be offset with travel voucher alone.

$PM_{2.5}$ TARGETS

Comment 3: *Although $PM_{2.5}$ concentrations were not directly monitored at Park Way in 2023, it is possible to estimate it from the PM_{10} data using a nationally derived factor. Considering that estimated $PM_{2.5}$ concentrations are above the $PM_{2.5}$ interim target of 12µg/m^3 for 2028 at Park Way (HO2), it should have been considered in the air quality assessment.*

Response 3: As discussed with the EPO, the use of $PM_{2.5}$ derivation from PM_{10} is not widely used for planning applications across the UK. The method is only used to provide an indication of PM fraction. Therefore, this particulate was note considered within the application at HO2.

Additionally, HO2 is located over 1 km from the site, along Park Way which has heavier traffic than the roads surrounding the site. It is also located adjacent to a traffic light junction that would expected to have slow moving and idling vehicles when lights are red. Concentrations at HO2 are expected to be higher than around the site and therefore were not used in the baseline conditions section of the report.

Comment 4: *An Interim Planning Guidance on the consideration of the Environmental Act $PM_{2.5}$ target in planning decisions was published in October 2024. Applicants are advised to provide evidence in their planning applications that they have identified key sources of air pollution within their schemes and taken appropriate action to minimise emissions of $PM_{2.5}$ and its precursors as far as is reasonably practicable.*

1. *How has exposure to $PM_{2.5}$ been considered when selecting the development site? Applicants are advised to consider the following in their application:*

    - *Site proximity to people (particularly large populations and/or vulnerable groups, e.g. schools, hospitals, care homes, areas of deprivation) and the impact of the development on these,*
    - *Site proximity to pollution sources and the impact of these on users of the development,*
    - *Exposure and emissions during both construction and in-use.*

2. *What actions and/or mitigations have been considered to reduce $PM_{2.5}$ exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of $PM_{2.5}$ and its precursors? Applicants are advised to*

explain (with evidence where possible) why each measure was implemented. Or, if no mitigation measures have been implemented, why this was not proposed. Actions can refer to, but are not limited to, the following:

- *Site layout,*
- *The development's design,*
- *Technology used in the construction or installed for use in the development,*
- *Construction and future use of the development.*

Response 4:

1. The development is located within a disused brownfield with the nearest receptors located to the northeast and other receptors located slightly further afield to the southwest to northerly directions. There were no vulnerable groups noted and population density was regarded as low, surrounding the immediate site boundary.

   The development has been considered in relation to $PM_{2.5}$ prior to the application submission. This has included a study of the neighbouring roads and advising on roads to be considered from the transport assessment, which also have fed into the air quality dispersion modelling assessment.

   A dust risk assessment was undertaken in order to understand the dust risk to the neighbouring community during the construction phase, where dust includes PM_{10} and $PM_{2.5}$ concentrations.

   A dispersion modelling assessment was undertaken to understand concentrations of $PM_{2.5}$ during the operational phase, which considered:

   - The impact of the development on the neighbouring community, including cumulative developments;
   - The impact of the area on the future site users; and
   - The impact of the existing basement car park under the Former Novartis Site, that is staying as part of the parking strategy for the apartments.

2. The dust risk assessment detailed that there is expected to be a medium risk during construction activities and mitigation measures have been prepared based on IAQM guidance.

   The construction phase was modelled using ADMS-Roads. It identified that concentrations of $PM_{2.5}$ are below the air quality objective within the site area. Additionally, the introduction of new vehicles on the road will not worsen $PM_{2.5}$ concentrations for the wider area.

MODELLING

Comment 5: *Diffusion tubes 5,6,7 are triplicates co-located with the NO_2 chemiluminescent monitor in Park Way and should not be used as an additional verification factor of the model. We have been monitoring air quality in Horsham for many*

years, and in 2023 there were 11 air quality monitoring sites in Horsham. Further clarification why only one site was used in the baseline and model verification.

The LAQM Technical Guidance 2022 states that Care needs to be taken when applying model adjustment based on one monitoring site only as the adjustment may not be representative of other locations.

For the verification and adjustment of NO_X/NO_2, a combination of continuous monitoring and diffusion tubes is recommended. As described above, some types of sites can perform differently, and it is considered better to have multiple sites at which to verify results rather than just one continuous monitor. The use of one continuous monitor alone to derive the adjustment factor for a model is not recommended as the monitoring site may not be representative of other locations modelled, and the adjustment factor derived will be heavily dependent on the source to receptor relationship as represented by the meteorological data file used in the dispersion model.

Full statistical analyses to give full picture of the model performance, including (but not limited to):

- *The correlation coefficient*
- *Fractional bias*
- *Root Mean Square Error (RMSE)*
- *The statistical analyses should also include model performance for PM_{10} and $PM_{2.5}$.*

Response 5: As discussed within the meeting, 5,6,7 tubes have been removed from the verification process. Other tube locations were not used as there was no transport data available for roads where other suitable diffusion tubes were located. HO2 verification factor of 1.35 has been added to the future scenarios for NO_2, as shown in Table 2.

As detailed above, the use of $PM_{2.5}$ derivation from PM_{10} is not widely used for planning applications across the UK. The method is only used to provide an indication of the PM fraction.

As suggested, PM_{10} has been added to the verification model, however, in our view this does not result in a realistic adjustment factor as the NO_X adjustment factor is 1.35 but the resulting PM_{10} factor is 8.77. This is due to a significant anomaly when comparing the Road- NO_X and Road-PM_{10} values (the measured NO_X or PM_{10} concentration minus the reported background concentration on the Defra background maps). The Road-NO_X and Road-PM_{10} values are 8.87 $\mu g/m^3$ and 1.07 $\mu g/m^3$ respectively, however, the emission factor in the EfT for NO_X for the local road is some eight times higher than that for PM_{10}. It is clearly inconceivable that vehicle emissions are responsible for the observed Road-PM_{10} contribution. In addition, there cannot be unusual dispersion conditions in this location that lead to a high PM_{10} adjustment factor as this would also be the case for NO_X (which appears to have an adjustment factor within the typical range).

Based on this outcome, in our view it would not be suitable to add a verification factor to the PM_{10} and $PM_{2.5}$ concentrations for the future year scenarios. Therefore, the NO_X verification factor has been added to all pollutants modelled, as the most representative factor for this project. The updated results using the HO2 NO_X verification factor is 1.35. The results are detailed in Tables 3 and 4.

Updated Modelling Results

Modelled results show that NO_2, PM_{10} and $PM_{2.5}$ concentrations are below their respective Air Quality Objectives for both future scenarios. Additionally, the scenario with the development in place is expected to have a negligible impact at modelled receptor locations.

Table 2: Annual Mean NO_2 Concentrations

Receptor ID	Annual Mean NO_2 Concentration ($\mu g/m^3$)		% Change Relative to AQAL	Impact Descriptor
	2027 Without Development	2027 With Development		
E01	10.5	10.5	0.0	Negligible
E02	11.9	11.9	0.1	Negligible
E03	11.0	11.0	0.1	Negligible
E04	11.0	11.0	0.1	Negligible
E05	12.1	12.2	0.3	Negligible
E06	11.4	11.4	0.2	Negligible
E07	12.0	12.1	0.3	Negligible
E08	10.2	10.3	0.2	Negligible
E09	11.0	11.1	0.3	Negligible
E10	11.8	11.8	0.1	Negligible
E11	10.5	10.6	0.1	Negligible
P01	11.2	11.3	0.4	Negligible
P02	10.0	10.3	0.8	Negligible
P03	9.7	9.8	0.2	Negligible
P04	9.6	9.7	0.2	Negligible
P04	9.6	9.7	0.1	Negligible
P04	9.6	9.7	0.1	Negligible
P04	9.6	9.7	0.0	Negligible
P05	9.7	9.8	0.2	Negligible
P05	9.7	9.7	0.2	Negligible
P05	9.7	9.7	0.2	Negligible
P05	9.6	9.7	0.1	Negligible
P06	9.7	10.0	0.9	Negligible
P06	9.7	9.8	0.4	Negligible
P06	9.7	9.7	0.2	Negligible
P06	9.6	9.7	0.1	Negligible
P07	9.7	10.3	1.6	Negligible
P07	9.7	9.9	0.5	Negligible

Receptor ID	Annual Mean NO_2 Concentration ($\mu g/m^3$)		% Change Relative to AQAL	Impact Descriptor
	2027 Without Development	2027 With Development		
P07	9.7	9.8	0.2	Negligible
P07	9.7	9.7	0.1	Negligible
P08	9.8	10.4	1.7	Negligible
P08	9.8	10.0	0.5	Negligible
P08	9.7	9.8	0.3	Negligible
P08	9.7	9.8	0.2	Negligible
P09	9.8	10.5	1.8	Negligible
P09	9.8	10.1	0.8	Negligible
P09	9.7	9.9	0.3	Negligible
P09	9.7	9.8	0.2	Negligible
P10	9.7	10.2	1.2	Negligible
P10	9.7	9.9	0.4	Negligible
P10	9.7	9.8	0.2	Negligible
P10	9.7	9.7	0.1	Negligible
P11	9.7	10.1	1.2	Negligible
P11	9.7	9.9	0.5	Negligible
P11	9.7	9.7	0.2	Negligible
P11	9.6	9.7	0.0	Negligible
P12	9.9	10.1	0.4	Negligible
P12	9.9	10.0	0.4	Negligible
P12	9.8	9.9	0.3	Negligible
P12	9.7	9.8	0.1	Negligible
P13	9.8	10.0	0.5	Negligible
P13	9.8	10.0	0.4	Negligible
P13	9.8	9.9	0.3	Negligible
P13	9.7	9.8	0.2	Negligible

Table 3: Annual Mean PM_{10} Concentrations

Receptor ID	Annual Mean PM_{10} Concentration ($\mu g/m^3$)		% Change Relative to AQAL	Impact Descriptor
	2027 Without Development	2027 With Development		
E01	11.1	11.1	0.0	Negligible
E02	11.6	11.6	0.0	Negligible
E03	11.4	11.4	0.0	Negligible
E04	11.4	11.4	0.0	Negligible
E05	11.9	11.9	0.1	Negligible
E06	11.5	11.6	0.1	Negligible
E07	11.8	11.8	0.1	Negligible
E08	11.6	11.6	0.1	Negligible
E09	11.3	11.4	0.0	Negligible
E10	11.8	11.8	0.0	Negligible
E11	11.2	11.2	0.0	Negligible
P01	11.4	11.4	0.1	Negligible
P02	10.9	11.0	0.3	Negligible
P03	10.8	10.8	0.1	Negligible
P04	10.7	10.8	0.0	Negligible
P04	10.7	10.8	0.0	Negligible
P04	10.7	10.7	0.0	Negligible
P04	10.7	10.7	0.0	Negligible
P05	10.8	10.8	0.0	Negligible
P05	10.8	10.8	0.0	Negligible
P05	10.7	10.8	0.0	Negligible
P05	10.7	10.7	0.0	Negligible
P06	10.8	10.8	0.1	Negligible
P06	10.8	10.8	0.0	Negligible
P06	10.7	10.8	0.0	Negligible
P06	10.7	10.7	0.0	Negligible
P07	10.8	10.8	0.1	Negligible
P07	10.8	10.8	0.0	Negligible
P07	10.8	10.8	0.0	Negligible
P07	10.8	10.8	0.0	Negligible
P08	10.8	10.8	0.1	Negligible
P08	10.8	10.8	0.0	Negligible
P08	10.8	10.8	0.0	Negligible
P08	10.8	10.8	0.0	Negligible
P09	10.8	10.9	0.1	Negligible

Receptor ID	Annual Mean PM_{10} Concentration ($\mu g/m^3$)		% Change Relative to AQAL	Impact Descriptor
	2027 Without Development	2027 With Development		
P09	10.8	10.8	0.1	Negligible
P09	10.8	10.8	0.0	Negligible
P09	10.8	10.8	0.0	Negligible
P10	10.8	10.8	0.1	Negligible
P10	10.8	10.8	0.0	Negligible
P10	10.8	10.8	0.0	Negligible
P10	10.8	10.8	0.0	Negligible
P11	10.8	10.8	0.1	Negligible
P11	10.8	10.8	0.0	Negligible
P11	10.7	10.8	0.0	Negligible
P11	10.7	10.7	0.0	Negligible
P12	10.9	10.9	0.0	Negligible
P12	10.8	10.9	0.0	Negligible
P12	10.8	10.8	0.0	Negligible
P12	10.8	10.8	0.0	Negligible
P13	10.8	10.8	0.0	Negligible
P13	10.8	10.8	0.0	Negligible
P13	10.8	10.8	0.0	Negligible
P13	10.8	10.8	0.0	Negligible

Table 4: Annual Mean $PM_{2.5}$ Concentrations

Receptor ID	Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$)		% Change Relative to AQAL	Impact Descriptor
	2027 Without Development	2027 With Development		
E01	7.0	7.0	0.0	Negligible
E02	7.3	7.3	0.1	Negligible
E03	7.1	7.2	0.1	Negligible
E04	7.1	7.1	0.1	Negligible
E05	7.4	7.4	0.2	Negligible
E06	7.2	7.3	0.2	Negligible
E07	7.4	7.4	0.2	Negligible
E08	7.2	7.2	0.1	Negligible
E09	7.1	7.1	0.1	Negligible
E10	7.4	7.4	0.1	Negligible
E11	7.1	7.1	0.0	Negligible
P01	7.2	7.2	0.2	Negligible
P02	6.9	7.0	0.5	Negligible
P03	6.8	6.9	0.1	Negligible
P04	6.8	6.8	0.1	Negligible
P04	6.8	6.8	0.0	Negligible
P04	6.8	6.8	0.0	Negligible
P04	6.8	6.8	0.0	Negligible
P05	6.8	6.8	0.1	Negligible
P05	6.8	6.8	0.1	Negligible
P05	6.8	6.8	0.0	Negligible
P05	6.8	6.8	0.0	Negligible
P06	6.8	6.8	0.2	Negligible
P06	6.8	6.8	0.1	Negligible
P06	6.8	6.8	0.0	Negligible
P06	6.8	6.8	0.0	Negligible
P07	6.8	6.9	0.3	Negligible
P07	6.8	6.8	0.1	Negligible
P07	6.8	6.8	0.1	Negligible
P07	6.8	6.8	0.0	Negligible
P08	6.8	6.9	0.4	Negligible
P08	6.8	6.9	0.1	Negligible
P08	6.8	6.8	0.1	Negligible
P08	6.8	6.8	0.0	Negligible
P09	6.9	6.9	0.4	Negligible

Receptor ID	Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$)		% Change Relative to AQAL	Impact Descriptor
	2027 Without Development	2027 With Development		
P09	6.8	6.9	0.2	Negligible
P09	6.8	6.8	0.1	Negligible
P09	6.8	6.8	0.0	Negligible
P10	6.8	6.9	0.2	Negligible
P10	6.8	6.8	0.1	Negligible
P10	6.8	6.8	0.1	Negligible
P10	6.8	6.8	0.0	Negligible
P11	6.8	6.9	0.3	Negligible
P11	6.8	6.8	0.1	Negligible
P11	6.8	6.8	0.0	Negligible
P11	6.8	6.8	0.0	Negligible
P12	6.9	6.9	0.1	Negligible
P12	6.9	6.9	0.1	Negligible
P12	6.9	6.9	0.1	Negligible
P12	6.8	6.8	0.0	Negligible
P13	6.9	6.9	0.1	Negligible
P13	6.9	6.9	0.1	Negligible
P13	6.8	6.9	0.1	Negligible
P13	6.8	6.8	0.0	Negligible

Comment 6: *Further clarification for why EFT road type rural was applied in the model.*

Response 6: The EFT used 'Urban (not London)' for all roads within the model and all years modelled.

Comment 7: *The possibility of cumulative impacts should also be considered to quantify the combined impact at the receptors and assess it against the future baseline. Another future scenario should be modelled, as there is a notable proposed development (DC/25/0415) in close proximity that could contribute to an impact at receptors in combination with the development being assessed.*

Response 7: Cumulative impacts from committed developments have been included in the future year baseline scenario (without development). This also includes phase 3 development flows (although not committed yet) to understand cumulative impacts from the neighbouring development.