Dust and Air Quality Innovation and Expertise

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Re: Review of two Air Quality Assessments for the planning applications 17/4277M and 17/4034M, both for the proposal of residential developments off Chelford Road, Macclesfield.

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Disclaimer

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Executive Summary

Two planning proposals (17/4277M and 17/4034M) for residential developments within the unitary authority of Henbury Parish Council were submitted on 29 August and 03 October 2017 respectively to Cheshire East Council. Both proposals were supported by independent air quality assessments carried out by BWB Consulting (for 17/4277M) and Resource and Environmental Consultants Ltd (for 17/4034M). The proposed developments are located within close proximity to each other with 17/4227M located on the land immediately north of Chelford Road and 17/4034M located on the land south of Chelford Road and just outside Macclesfield.

Since the submissions, an air quality management area (AQMA) has been declared at Broken Cross roundabout which is in close proximity to both proposed developments. Henbury Parish Council instructed DustScanAQ to carry out an independent review of both air quality assessments.

The review of the reports and associated information found that neither air quality assessment considered the cumulative air quality impacts from both proposed residential developments and neither assessment considered the impact on the proposed Broken Cross AQMA.

The review also found independent comments relating to each report. The assessment carried out by BWB Consulting for proposal 17/4277M could have identified more receptors in the operational phase assessment and the report needed to clarify the definitions of the 'Opening Year' and 'Completion Year' terms used in the dispersion modelling scenarios. The report should also have concluded with whether the overall impact from the proposed development would be significant or not.

The assessment carried out by Resource and Environmental Consultants Ltd for 17/4034M was thought to not have used the most representative data available for dispersion modelling. The report should have considered the impact from the construction of a new roundabout which would be used for access to the new site and should have set out some operational phase mitigation measures following the outcome of the assessment.

Since the air quality assessments were submitted, redesigning the Broken Cross roundabout into a signalled junction has been considered as a method to address the air quality concerns. These changes will impact the results of the dispersion modelling and the operational impact from the proposed developments. BWB Consulting prepared a Technical Note in response to comments from Cheshire East Council who initially rejected the proposal. While the Technical Note addressed some of the concerns raised by the Council, it was thought that the Technical Note could have provided more information on air quality within the AQMA with and without the proposed junction improvements at Broken Cross roundabout and the statement still did not consider cumulative impacts.

For a reliable and confident decision to be made on whether one or both of the proposed developments will be able to go ahead without causing a significant impact on air quality, DustScanAQ recommends considering the comments outlined in this review.

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1.0 Introduction

DustScanAQ (DS) was instructed by Henbury Parish Council (HPC) to review two air quality assessments submitted in association with planning applications 17/4277M (submitted on 29 August 2017) and 17/4034M (submitted on 03 October 2017) for proposed residential developments within HPC. The air quality assessment[1] in association with 17/4277M was undertaken by BWB Consulting (BWB) on behalf of Frederic Robinson Ltd (FRL) for the proposed residential development on the land north of Chelford Road, Macclesfield (hereafter known as 'northern proposed development'). The air quality assessment[2] in association with 17/4034M was undertaken by Resource and Environmental Consultants Ltd (REC) on behalf of Jones Homes and Redrow Homes (JHR) for the proposed residential development on the land south of Chelford Road, Macclesfield (hereafter known as 'southern proposed development').

2.0 Review

2.1 BWB AQA for the proposed residential development on the land north of Chelford Road, Macclesfield

The potential air quality impacts on the local area from the 'northern proposed development' of 135 residential dwellings with associated landscaping, open space and vehicular access on the land north of Chelford Road are presented in the BWB AQA which has been reviewed. An overview of the assessment and comments are presented below. The site location is presented in Figure B 1 in Appendix B.

2.1.1 Overview of BWB AQA

The BWB AQA has been carried out in accordance with the appropriate European, National and Local policy and legislation as set out Section 2.0 of the report. The assessment was also carried out in accordance with appropriate guidance; including the Institute of Air Quality Management (IAQM) Construction Dust Guidance (2014)[3], the IAQM Planning Guidance (2017)[4] and the Local Air Quality Management (LAQM), Technical Guidance (2016)[5] which sets out the relevant Air Quality Objectives (AQO) for the key pollutants considered in the report.

BWB established site baseline air quality conditions and current air quality issues within the locality of the proposed development which are set out in Section 4.0 of the report. Section 4.1 identifies the close proximity of the Air Quality Management Area (AQMA) proposed at Broken Cross roundabout for annual exceedances in NO_2. Since the report was issued (August 2017) the Broken Cross AQMA has been declared (see Figure B 1, Appendix B). There is no air quality action plan (AQAP) in place yet for the AQMA which should consider future developments, although this is likely in development.

The assessment on the potential impacts from the construction phase of the development are set out in Section 5.0 of the report and the assessment on the potential operational impacts and residential suitability of the proposed development are set out in Section 6.0. The IAQM Construction Dust Guidance was used to assess construction phase impacts and the assessment determined the overall impacts from construction to be not significant.

[1] BWB Consultancy 2017: Chelford Road, Henbury, Air Quality Assessment.
[2] REC 2017: Air Quality Assessment Chelford Road, Macclesfield.
[3] IAQM 2014: Guidance on the Assessment of Dust from Demolition and Construction.
[4] IAQM 2017: Land-Use Planning and Development Control: Planning for Air Quality.
[5] Local Air Quality Management 2016: Technical Guidance (TG 16).

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Road traffic emissions from the operational phase were assessed using IAQM guidance and ADMS Roads modelling software. Existing sensitive receptors were identified and modelled for key pollutants for the base year (2016), opening year (2019) and completion year (2024) both 'with' and 'without' the development. The assessment determined a 'Moderate' impact at two existing receptors where the annual mean for NO_2 was predicted to exceed the AQO (40 µg/m^3). The assessment also determined a 'Slight' impact at two receptors and a 'Negligible' impact at the other 15 identified receptors. The exceedances in the AQO for NO_2 were considered to be a result of the elevated background and the impact from the proposed development was minimal and would not cause any additional exceedances in the AQO at other receptors.

2.1.2 DS Comments on BWB AQA

This section presents comments made by DS on the BWB AQA in relation to the assessment on potential air quality impacts arising as a result of the proposed development on the land north of Chelford Road. Suggested comments on how the BWB AQA could be improved are based on how the potential air quality impacts were assessed using local policy as well as IAQM construction dust and planning guidance and DMRB guidance[6]. Table A 1, Appendix A gives further details on these comments, relevant guidance and policy and suggested future actions.

The DS comments on the BWB AQA are summarised below. The assessment should consider:

- Assessing potential cumulative impacts on the local area by addressing the proposed development on the south of Chelford Road, which opposite the 'northern proposed development' (Figure B 1);
- Identifying all sensitive receptors along the affected road network from the 'northern proposed development'. The report could have assessed more receptors;
- Assessing potential operational impacts on the Broken Cross AQMA;
- Clarifying the meaning of earliest 'opening year'. It is not clear if the development will be a constructed in a series of phases and if some of the dwellings will be occupied during the opening year or if the opening year implies the start of construction;
- Fully assessing the potential impacts that construction traffic could have on the local area; and
- Stating if there will be an overall significant impact on the local area from the 'northern proposed development'.

2.1.3 DS Comments on BWB Technical Note

It is understood that Cheshire East Council (CEC) initially rejected the proposal from BWB as it was deemed the AQA did not include sufficient information relating to the potential impact on the soon to be declared Broken Cross AQMA. CEC refused the application given the predicted increase in NO_2 concentrations at the new AQMA in order to safeguard residential amenity, public health and quality of life.

BWB prepared a Technical Note in response to CEC's comments stating that the assessment had considered the worst-case scenarios. The technical statement also provides further information on operational phase mitigation measures, including a travel plan, and highlighted that national statistics show an increase in distances travelled by sustainable transport and electric vehicle uptake which the proposed development is promoting. BWB also highlighted that junction improvements at the Broken Cross roundabout will decrease vehicle queuing lengths along the A537 (Chelford Road).

[6] Design Manual for Roads and Bridges 2007: Volume 2, Section 3

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While the Technical Note did address some of CEC's concerns, the report still did not consider cumulative impacts from the other proposed residential development. The Technical Note provided information relating to traffic queues with the proposed junction improvements but did not provide evidence for assessing the changes in air quality with the proposed new signalised junction layout.

It is understood that the current roundabout at Broken Cross is at or close to capacity during peak times. The proposed signalised junction may help to reduce queue lengths during peak times but could also have a negative impact on other times of the day and potentially create pollution hotspots at signals. Further work should therefore include justification for how the new junction signals will impact air pollution hotspots in the AQMA both at peak hours (by reduction in queue lengths) and at non-peak hours where queues may be longer.

2.2 REC AQA for the proposed residential development on the land south of Chelford Road, Macclesfield

The potential air quality impacts on the local area from the 'southern proposed development' on the land south of Chelford Road, which includes 232 residential units and associated parking have been reviewed. An overview of the assessment and comments are presented below. The site location is presented in Figure B 1 in Appendix B.

2.2.3 Overview of REC AQA

The REC AQA has been carried out in accordance with the appropriate European, National and Local policy and legislation as set out in Section 2.0 of the report. The report also refers to relevant air quality guidance throughout the report including the IAQM Construction Dust Guidance, IAQM Planning Guidance, and LAQM Technical Guidance.

REC have identified the current air quality issues within the locality of the proposed development site which are set out in Section 4.0 of the REC report. The report identifies the close proximity of the proposed development to the Broken Cross AQMA which has been declared since the report was issued. Section 4.0 also presents the baseline conditions at the site of the proposed development, in accordance with IAQM planning guidance, using local NO_2 diffusion tube monitoring data and Defra predicted background concentrations.

The potential impacts from the construction and operational phase of the proposed development have been addressed in Section 5.1 and Section 5.2 of the REC report. IAQM guidance was used to assess air quality impacts on potential sensitive receptors. ADMS Roads was also used in Section 5.2 to model the traffic scenarios suggested in Section 6.22 within the IAQM Planning Guidance, assessing potential impacts of exhaust emissions, including NO_2 and PM_{10}.

Section 5.1.4 of the REC report concludes that impacts from construction dust activities are predicted not to be significant on potential residential receptors and Section 5.2.3 states that the operational phase road traffic emissions were determined to be not significant. Consequently, the overall impact from the proposed development on potential sensitive receptors was considered to be not significant.

2.2.4 DS Comments on REC AQA

This section presents comments made by DS on the REC AQA in relation to the assessment on potential air quality impacts arising as a result of the proposed development on the land south of Chelford Road. Suggested comments on how the REC AQA could be improved are based on how potential air quality impacts were assessed using local policy as well as IAQM construction dust

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and planning guidance and DMRB guidance. Table A 2, Appendix A gives further details on these comments and suggested future action.

The DS comments on the REC AQA are summarised below. The assessment should consider:

- Reviewing the model input data and assessing the most representative sources for the proposed development;
- Reviewing the monitoring data used to verify the modelling results. It is thought that the data used was not the most representative, with monitoring data from within the AQMA available and not used;
- Assessing the potential cumulative impacts on the local area by addressing the proposed development north of Chelford Road and opposite the 'southern proposed development' (Figure B 1);
- Fully assessing the impact of construction traffic from the proposed development site on the local area;
- Including the proposed development of a roundabout at the site entrance and what impacts this would have on traffic flow and modelled emissions;
- Re-assessing the decision of the overall impact the southern proposed development could have on the local area;
- Fully assessing the potential impacts of the proposed development on the Broken Cross AQMA; and
- Including operational mitigation measures based upon the magnitude of the impact at some receptors was deemed to be 'slight' or 'moderate' (Section 5.2 of the REC AQA).

2.3 Further Considerations

Both the REC AQA and the BWB AQA have been carried out for planning application of two proposed developments adjacent to each other on the A537 in between Henbury and the Broken Cross roundabout. The planning application for 17/4277M which included the BWB AQA was submitted on 29 August 2017. The planning application 17/4034M which included the REC AQA was submitted on 03 October 2017.

2.3.1 Comparison

The two AQAs were reviewed against each other. DS found that although both AQAs identified sensitive receptors that were located either adjacent to or within very close proximity to each other along the A537, there were large differences in predicted NO_2 concentrations between the two reports. Table A 1 (Appendix A) presents comments made by DS on the difference in predicted concentrations.

2.3.2 Additional Information

Since the submission of both AQAs to HPC in relation to the relevant planning applications, further information including changes in the design of the proposed developments and in the road layout at the locality has been submitted. Table A 4 (Appendix A) identifies the implications these changes could have on the northern and southern proposed developments. Both reports may need to consider modelling scenarios with the proposed changes to the Broken Cross roundabout.

3.0 Summary

DS has reviewed the AQAs carried out by BWB and REC and presented comments and recommendations for future assessments. Comments made by DS were completed by comparing

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the method and results from the AQAs against local policy and relevant national guidance. DS presented similar comments to both AQAs as well as presenting individual points for improvement.

Overall DS suggest that for a reliable and confident decision to be made regarding both developments, all comments outlined in this report should be addressed using the recommended actions presented within Appendix A of this review.

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4.0 Appendices

Appendix A

A.1 Review of BWB AQA

Table A 1: DS comments and recommendations on BWB AQA

Comment	Relevant Section of Report	Relevant Guidance	Further Comments	Recommendations
Assessment of cumulative impacts	Section 6.0	Cheshire East Local Plan Strategy Policy SE 12 states: "*The council will seek to ensure all development is located and designed so as not to result in a harmful or cumulative impact on air quality*…" IAQM Planning Guidance Point 6.21 states: "*The possibility of cumulative impacts should also be considered. Therefore, there may be a case for modelling another future scenario, with committed development excluded, to allow the cumulative*	The BWB report was submitted on 29 August 2017 in relation to planning application 17/4277M for the 'northern proposed development'. The REC AQA was submitted on 03 October 2017 in relation to planning application 17/4034M for the 'southern proposed development'. Both planning applications have been submitted for potential residential developments adjacent to each other on the A537 (Chelford Road). Both proposed residential developments are within very close proximity to the Broken Cross AQMA (Figure B 1) and both planning applications can be classed as large residential developments; with planning application 17/4277M proposing 135 dwellings and planning application 17/4034M proposing 232 dwellings, both including parking.	The BWB AQA needs to undertake an additional modelling scenario to provide predicted background concentrations on sensitive receptors and the Broken Cross AQMA if both proposed developments were to go ahead. This should be done using cumulative traffic data to assess future cumulative impacts.

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Comment	Relevant Section of Report	Relevant Guidance	Further Comments	Recommendations
		impact of all such future developments with planning permission to be assessed as one combined impact at sensitive receptors...it is difficult to include other planning applications yet to be determined, as the outcome is not certain." Point 6.22 states: "*Cumulative impacts and effects…when several such developments are contributing additional road traffic on one stretch of road…may be another notable proposed development (without planning permission) in close proximity that could contribute impacts at receptors in combination with the primary development being assessed. In these circumstances, it may be necessary to quantify this*	As both planning applications are for large scale developments, both developments would be contributing to significantly increased road traffic on the same stretch of road. This could potentially cause an increase in cumulative exhaust emissions within the area. Therefore, in relation to relevant local and IAQM guidance, these potential cumulative impacts from exhaust emissions on the local area must be addressed; though, this is not the case within BWB AQA. It is known that planning application 17/4277M was submitted before the submission of 17/4034M, thus BWB may not have been aware of the 'southern proposed development' at the time of submission. However, due to the 'northern proposed developments' close proximity to the 'Broken Cross' AQMA, potential cumulative impacts should have been identified.	

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Comment	Relevant Section of Report	Relevant Guidance	Further Comments	Recommendations
		combined impact for selected receptors and assess it against future baseline."		
Identification of all sensitive receptors along the affected road network	Section 6.0	IAQM Planning Guidance Section 6.22: Sub-section g: "*Local receptors should be identified, including residential and other properties close to and within the proposed development, as well as alongside roads significantly affected by the development, even if well away from the development site, and especially if within AQMAs."*	The BWB AQA identifies potential sensitive receptors within the proposed development and the Broken Cross AQMA. However, the AQA does not address sensitive receptors further along Chester Road towards Macclesfield town centre (Figure B 3). Chester Road would be part of the affected road network from the 'northern proposed development' as it would be used to reach the town centre. Therefore, operational traffic from the 'northern proposed development' also has the potential to impact sensitive receptors along this stretch of road. Not identifying all sensitive receptors prevents a decision on determining if there is an overall significant impact from operational traffic emissions from the 'northern proposed development' on the local area.	The BWB AQA should identify all sensitive receptors along the entire affected road network from operational traffic of the 'northern proposed development'. By assessing the potential magnitude of the impact on all individual receptors from the proposed development, the overall significance of the impact can be determined.

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Comment	Relevant Section of Report	Relevant Guidance	Further Comments	Recommendations
Assessment of potential operational impacts on Broken Cross AQMA	Section 6.0	IAQM Planning Guidance Section 6.7 states: "*…identify…the location of atmospheric pollution and the location of existing and proposed human-health sensitive receptors."* Section 6.22: Sub-section G states: "*Local receptors should be identified…especially if within AQMAs."* Sub-section M states: "*Whether the development will compromise or render inoperative the measures within an Air Quality Action Plan, where the development affects an AQMA; the significance of the effect of any impacts identified…"* Section 7.12 states: "*…the*	Figure B 3 presents the receptor locations presented in the BWB AQA, yet it is also clear there are further potential sensitive receptors within the Broken Cross AQMA which were not identified. Therefore, it is considered that the overall impact from the proposed development on the 'Broken Cross' AQMA cannot be assessed until a larger proportion of sensitive receptors within the Broken Cross AQMA have been identified and the magnitude of impact at each one assessed.	The AQA should clearly assess the potential operational impacts from the proposed development on Broken Cross AQMA. This can be achieved by identifying a larger proportion of the potential sensitive receptors within the AQMA that could be affected by operational traffic emissions from the proposed development. This would allow for the magnitude of the impacts at to be determined more comprehensively which can be used to assess the potential overall impact on the Broken Cross AQMA.

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Comment	Relevant Section of Report	Relevant Guidance	Further Comments	Recommendations
		presence of an AQMA that may be affected by a proposed development will increase the sensitivity of the application and any accompanying assessment. The impacts descriptor table (See Appendix C) *acknowledges this and points to a conclusion of significant effect in cases where concentrations of a regulated pollutant are in excess of the objective value at a receptor, but not exceeding it, a case may be made for the developments predicted contribution being significant."*		
Clarification of earliest opening year	Section 3.5 and Sub-section 6.8	IAQM Planning Guidance Section 6.22: "*Relevant details of the proposed development…opening year…"*	The BWB AQA presents that there will be the opening year and a completion year. Section 6.8 states: "Opening year (2019) with development and completion year (2024)." This statement is ambiguous as it is not clear what opening year means as in most cases it is the completion year. The large scale of the 'northern	The BWB AQA should clearly state what is meant by 'opening year' by setting out relevant details in compliance with the IAQM Planning Guidance. If the BWB AQA has stated an 'opening year' and a 'completion

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Comment	Relevant Section of Report	Relevant Guidance	Further Comments	Recommendations
		DMRB 2007 Section 3.5 to Section 3.6: "*The worst year in the first 15 years from the opening needs to be assessed…the earliest years tend to be worse for local air quality as vehicle emissions are set to decrease in the future due to increasingly stringent vehicle emission legislation.*" Section 3.6: "*If construction is expected to last for more than six months, then traffic management measures and the effect of the additional construction vehicles should also be assessed as an additional scenario…*"	proposed development', could mean the opening year is the starting year of the construction phase of the development, or it could mean that the development will have a phased approach.	year' because the proposed development will have a phased approach, then potential impacts of this phased approach must be correctly addressed by modelling a phased traffic scenario. Further to this, if the AQA is proposing a phased approach, 2019 may not be the start of the construction phase and therefore a further scenario to assess the potential impacts from construction vehicles must be carried out to fully comply with the DMRB guidance. A phased approach may also impact the outcome of the construction dust assessment as new receptors will be constructed and occupied before the development is complete and should be taken into consideration. Regardless of the meaning of 'opening year', if the proposed development has the potential to

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Comment	Relevant Section of Report	Relevant Guidance	Further Comments	Recommendations
				be in operational in 2019, the BWB AQA should use 2019 as its earliest opening year when modelling traffic scenarios. Thus, the AQA will comply with DMRB guidelines, ensuring the worst-case scenario is addressed.
Overall significant impact	Section 6.0 and Section 8.0	IAQM Planning Guidance Section 6.22 states: "*The distance over which impacts are likely to occur and an estimate of the number of properties likely to be affected should be included*." Section 7: Assessing Significance Sub-point 7.4 states: "*…impact descriptors are intended for application at a series of individual receptors. Whilst it may be that there are 'slight', 'moderate' or 'substantial'*	The BWB report does not set out the number of residential properties at the identified sensitive receptors which is advised in Section 6.22 of the IAQM Planning Guidance. The operational impact assessment (Section 6.0) does not conclude whether the overall impact on local air quality will be significant or not. The section does state that 'slight' and 'moderate' impacts on sensitive receptors for increases in the NO_2 annual mean are mostly due to elevated background concentrations and Sections 7.2 to 7.5 set out suggested mitigation for road traffic emissions. However, the report should state the overall operational significance in	The report should present the number of residential dwellings at each receptor where a 'slight' or above impact is predicted. This is considered appropriate to confidently determine whether the overall impact from the proposed development will be significant. The AQA should refer to the appropriate IAQM guidance when determining significance. This would allow for the overall impact of the proposed development to correctly be assessed against the IAQM guidance.

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Comment	Relevant Section of Report	Relevant Guidance	Further Comments	Recommendations
		impacts at one or more receptors, the overall effect may not necessarily be judged as being significant in some circumstances." Sub-point 7.6 states: "*…circumstances where a single development can be judged in isolation, it is likely that a 'moderate' or 'substantial' impact will give rise to a significant effect, but such judgements are always more likely to be valid at the two extremes of impact severity*." Sub-point 7.9 states: "*…reasons for reaching the conclusions should be transparent and set out logically.*" Sub-point 7.13 states: "*Where the air quality is such than an air quality*	compliance with the IAQM guidelines.	Also, when assessing the potential overall significant impact of the proposed development, IAQM guidance relating to assessments of developments in isolation should not be used. This is because as previously stated another planning application has been submitted in the area. Therefore, there is the potential that the 'northern proposed development' would not be built in isolation.

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Comment	Relevant Section of Report	Relevant Guidance	Further Comments	Recommendations
		objective at the building façade is not met, the effect on residents or occupants will be judgement as significant, unless provision is made to reduce their exposure by some means."		

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A.2 Review of REC AQA

Table A 2: DS comments and recommendations on REC AQA

Comment	Section of Report	Relevant Guidance	Further Comment	Recommendation
Model input data	Section 4.2	IAQM Planning Guidance Section 6.22: Sub-section f: "*the most appropriate monitoring data must be presented within an air quality assessment.*" Section 6.22: Sub-section e: "*…details should be provided on…source of the meteorological data, with description of how representative they are of the conditions in the vicinity of the proposed development…"*	Cheshire East Council (CEC) Air Quality Annual Status Report (2017)[7] sets out all automatic and non-automatic monitoring locations within CEC. Broken Cross NO_2 diffusion tube monitoring location (National Grid Reference 389619, 373659) is presented in Figure B 4. It is the closest monitoring point to the proposed development and is located on the A537, within the Broken Cross AQMA and approximately 500 m west from the development (Figure B 4). Therefore, this monitoring location is considered the most appropriate in relation to the proposed development. However, the monitoring data is not presented in the REC report. Thus, the report does not present all available monitoring data appropriate to the proposed development.	Data from Broken Cross NO_2 diffusion tube monitoring location should be presented within the baseline section of the REC report.
Verification of model	Section 5.2 and Appendix 2	Cheshire East Local Plan Strategy Policy SE 12 states: "*The council will seek to ensure*	As stated above, Broken Cross monitoring station is considered the most appropriate monitoring location in relation to the proposed development, giving the best representation	The verification of NO_x to NO_2 should use monitoring data from Broken Cross NO_2 diffusion tube monitoring

[7] Cheshire East Borough Council 2017: Air Quality Annual Status Report.

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Comment	Section of Report	Relevant Guidance	Further Comment	Recommendation
		all development is located and designed so as not to result in a harmful or cumulative impact on air quality…" IAQM Planning Guidance - Section 6.22 states: Sub-point F states: "*model verification is an important aspect of the assessment, especially when predicted concentrations are close to the relevant objective, and should be based upon the most appropriate available monitoring data*."	of current NO_2 concentrations within the Broken Cross AQMA. As the REC report does not present the Broken Cross diffusion tube monitoring data, it is considered that the verification of NO_x to NO_2 concentrations from the dispersion modelling presented in Appendix 2 does not use the most appropriate monitoring data. Therefore, the verification factor is not considered to be the most suitable for predicting NO_2 concentrations at identified sensitive receptors in any of the modelled scenarios within the report.	station. The updated verification factor should then be used to recalculate predicted NO_2 concentrations at all identified sensitive receptors within all modelled scenarios.
Assessment of cumulative impacts	Section 5.2	Cheshire East Local Plan Strategy Policy SE 12 states: "*The council will seek to ensure all development is located and designed so as not to result in a harmful or cumulative impact on air quality…*" IAQM Planning Guidance	The REC report was submitted in relation to planning application 17/4034M which was submitted on 03 October 2017. Planning application 17/4277M was submitted on 29 August 2017. Figure B 1 shows that both planning applications have been submitted for potential residential developments opposite to each other on the A537 (Chelford Road). Both proposed residential developments are within very close proximity to the Broken	The REC report needs to undertake an additional modelling scenario to provide predicted NO_2 concentrations on sensitive receptors if both proposed developments were to go ahead. This should be done using cumulative traffic data. This will allow future cumulative impacts to be assessed.

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Comment	Section of Report	Relevant Guidance	Further Comment	Recommendation
		Point 6.21 states: "*The possibility of cumulative impacts should also be considered. Therefore, there may be a case for modelling another future scenario, with committed development excluded, to allow the cumulative impact of all such future developments with planning permission to be assessed as one combined impact at sensitive receptors...it is difficult to include other planning applications yet to be determined, as the outcome is not certain*." Point 6.22 states: "*Cumulative impacts and effects…when several such developments are contributing additional road traffic on one stretch of road…may be another notable proposed development (without planning permission) in*	Cross AQMA (Figure B 1) and both planning applications can be classed as large residential developments, with planning application 17/4277M proposing 135 dwellings and planning application 17/4034M proposing 232 dwellings, both including parking. Therefore, both developments would be contributing to additional road traffic on the same stretch of road, potentially causing an increase in cumulative impacts of exhaust emissions within the area. However, the REC AQA does not address the planning application for the 'southern proposed development', and thus does not address potential cumulative on the local area including the Broken Cross AQMA.	

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Comment	Section of Report	Relevant Guidance	Further Comment	Recommendation
		close proximity that could contribute to an impact at receptors in combination with the primary development being assessed. In these circumstances, it may be necessary to quantify this combined impact for selected receptors and assess it against future baseline."		
Assessment of construction traffic	Section 5.1	IAQM Construction Dust Guidance DMRB 2007 Section 3.6: "*If construction is expected to last for more than six months, then traffic management measures and the effect of additional construction vehicles should be assessed as an additional scenario…"*	The REC report carries out the appropriate construction dust assessment in accordance with appropriate IAQM guidelines. Due to the size of the development, it is realistic to assume the construction phase of the development will last longer than six months. Therefore, an assessment on the emissions impact and management of construction vehicles on the locality of the proposed development is needed to comply with DMRB guidance. Section 5.1 however does not carry out a full assessment from potential operational impacts; only assessing the effect of trackout caused by potential construction traffic.	REC AQA should address the construction traffic impacts in accordance with the DMRB guidance. Further to this, a scenario including construction traffic from both proposed developments on Chelford Road should be carried out as it is likely the construction periods of both developments would overlap, and construction traffic would be using the same road network.
Inclusion of a	N/A	IAQM Planning Guidance	CBO transport submitted a transport	The REC AQA should identify

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roundabout at the proposed development site entrance on Chelford Road		Table 6.2: "*The development will…introduce a new junction or remove an existing junction near relevant receptors.*" DMRB 2007 Section 3.12: "*Identify which roads are likely to be affected by the proposals. Affected roads are those that meet any of the following criteria…road alignment will change by 5m or more; daily average speed will change by 10/hr or more; or peak hour speed will change by 20km/hr or more…change in local air quality, near affected roads.*"	statement[8] for the planning application 17/4034M. The transport statement proposes the creation of a roundabout at the site entrance of the proposed development off Chelford Road. This proposed roundabout is presented in Figure B 5. The construction of a roundabout as part of the proposed development would cause changes to the Chelford Road layout and impact traffic flow, traffic speed and therefore road traffic emissions. The REC AQA does not address the proposal of the new roundabout at the site entrance of the proposed development off Chelford Road and the potential impact it could have on modelled traffic flow and speed. Therefore, the REC AQA does not address the potential traffic emission impacts that the proposed development could have on air quality on the local area if there was an additional roundabout on Chelford Road.	the proposed change in the road layout at the 'southern proposed development' site entrance on Chelford Road. This should be carried out by identifying traffic scenarios with and without the proposed roundabout. Another scenario including traffic from the 'northern proposed development' with and without the proposed roundabout should also be undertaken as it is located on the affected road network (Figure B 1). This this will ensure potential cumulative impacts on sensitive receptors have been fully addressed.
Assessment of potential operational impacts on the Broken	Section 5.2 and Appendix 1	IAQM Planning Guidance: Section 6.7 states: *"…identify…the location of atmospheric pollution and*	Figure B 6 presents the receptor locations presented in the REC report. Figure B 3 clearly shows there are further potential sensitive receptors within the Broken Cross AQMA which were not identified in the REC	The REC report should clearly assess the potential operational impacts from the proposed development on the Broken Cross AQMA. This can be done

[8] CBO Transport 2017: Outline Planning Application for Residential Development Chelford Road, Macclesfield

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Comment	Section of Report	Relevant Guidance	Further Comment	Recommendation
Cross AQMA		*the location of existing and proposed human-health sensitive receptors."* Section 6.22: Sub-section G states: *"Local receptors should be identified…especially if within AQMAs."* Sub-section M states: *"Whether the development will compromise or render inoperative the measures within an Air Quality Action Plan, where the development affects an AQMA; the significance of the effect of any impacts identified…"* Section 7.12 states: *"…the presence of an AQMA that may be affected by a proposed development will increase the sensitivity of the application and any accompanying assessment. The impacts descriptor*	report. Therefore, it is considered that the overall impact from the proposed development on the Broken Cross AQMA needs to be assessed in greater detail to confidently determine the overall significance of the proposed development.	by identifying a larger proportion of the potential sensitive receptors within the AQMA, allowing the significance of the impact at more receptors to be determined. This enables the overall potential impact from the proposed development on Broken Cross AQMA to be more comprehensively determined.

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		table (See Appendix…) acknowledges this and points to a conclusion of significant effect in cases where concentrations of a regulated pollutant are in excess of the objective value at a receptor, but not exceeding it, a case may be made for the developments predicted contribution being significant."		
Overall significant impact	Section 5.2.1 and Section 5.2.3	IAQM Planning Guidance Section 6.22 states: "*The distance over which impacts are likely to occur and an estimate of the number of properties likely to be affected should be included*." Section 7: Assessing Significance Sub-point 7.4 states: "*…impact descriptors are intended for application at a series of individual receptors. Whilst it may be that there are 'slight',*	The REC report does not set out the number of residential properties at the identified sensitive receptors which is advised in Section 6.22 of the IAQM Planning Guidance. Section 5.2.3 of the REC report evaluates the overall proposed development impact significance. Within Section 5.2.3 of the REC report, it is explained that although the impact at one receptor (R17 presented in Figure B 6) was predicted as 'moderate', there are only a small number of properties at this location. Further to this, the REC report found that the predicted impact at all other receptors was 'slight' at one and negligible at the other 24. This suggests the overall impact on air quality at sensitive receptors from the proposed development is predicted to be not significant	The AQA should present the number of residential dwellings at each receptor where a 'slight' or above impact is predicted. This is considered appropriate to confidently determine whether the overall impact from the proposed development will be significant. The report should correctly refer to the IAQM guidance. This would allow for the overall impact of the proposed development to accurately be assessed against the IAQM guidance.

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		'moderate' or 'substantial' impacts at one or more receptors, the overall effect may not necessarily be judged as being significant in some circumstances." Sub-point 7.6 states: "*…circumstances where a single development can be judged in isolation, it is likely that a 'moderate' or 'substantial' impact will give rise to a significant effect, but such judgements are always more likely to be valid at the two extremes of impact severity*." Sub-point 7.9 states: "…*reasons for reaching the conclusions should be transparent and set out logically.*" Sub-point 7.13 states: "*Where the air quality is such than an air quality objective at the building façade is not met, the effect*	in accordance with Section 6.22: Sub-point J in the IAQM planning guidance. Although as stated, the REC report does not identify exactly how many residential properties are at receptor 17. Without knowing the estimated number of properties predicted to be affected by the proposed development, a valid judgement on the overall significant impact from the site cannot be predicted. Section 5.2.1 of the REC report miss quotes part of Section 7: Sub-section 7.6 of the IAQM planning guidance when explaining that overall the proposed development would not cause a significant impact. Therefore, Section 5.2.1 cannot state there would not be an overall significant impact if the proposed development was built on miss-quoted guidance. Further to this, Section 5.2.1 of the REC report states there will not be an overall significant impact if the proposed development is judged in isolation. As previously stated, the proposed development is not the only large residential development being proposed on the same stretch of road. Therefore, for the overall significant impact of	When assessing the potential overall significance of the impact from the proposed development, the assessment should not consider the development in isolation. As previously stated, this should include cumulative impacts from other proposed developments.

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		on residents or occupants will be judgement as significant, unless provision is made to reduce their exposure by some means."	the proposed development to be realistically judged, it cannot be assumed to be the only new development by 2022 (the predicted opening year of the proposed development) on the A537 within HPC.	
Operational mitigation measures	Section 5.2	IAQM Planning Guidance Section 6.22: Sub-section L states: "*Mitigation measures. In those cases where a significant effect is identified then the measures to be employed to avoid, reduce and, where appropriate, offset this effect should be set out. Even where the effect is judged to be insignificant, consideration should be given to the application of good design and good practice measures…"*	Section 5.2 of the REC AQA sets out the assessment of the operational phase of the proposed development. Sub-section 5.2.3 puts forward that there will not be an overall significant impact from the operational phase of the proposed development. Section 5.2 however, does present that two individual sensitive receptors have the potential to experience 'slight' and 'moderate' significant operational impacts from the proposed development. Therefore, in accordance to the IAQM planning guidance, the REC report should set out mitigation measures to minimise or offset these potential effects. However, the report does not include any operational mitigation measures.	The REC report should present suitable operational mitigation measures based on criteria set out in the IAQM Planning Guidance to help minimise or offset the significant impacts at receptors where 'slight' and 'moderate' significance was predicted.

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A.3 Comparison of Reports

Table A 3: Comparison between BWB AQA and REC AQA

Comparison	Comment	Recommendation
Predicted NO_2 concentrations at identified sensitive receptors	Both AQAs predicted NO_2 concentrations at the earliest opening year 'with' and 'without' the proposed development. Figure B 3 presents that many of the BWB AQA modelled receptors are in similar locations to the modelled receptors within the REC AQA. However, Table 6.4 in Section 6 within the BWB AQA and Table 20 within Section 5.2 of the REC AQA present very different NO_2 results for modelled scenarios at identified sensitive receptors. Although future year predictions may vary according to the year of prediction, differences are still significant. This led to differences between the AQAs in determining the magnitude of impacts at some receptors which were situated next to each other. The most likely reason for the differences in predicted NO_2 concentrations is due to different model inputs being used in each AQA including traffic, meteorological and monitoring data.	Both AQAs should review their dispersion modelling, using the most representative data available for all model inputs. Manchester weather station should be used for meteorological data and diffusion tube data from within the Broken Cross AQMA (e.g. CE91) should be used for baseline monitoring data, as these are the closest and most representative sources of meteorological and background data. This data should however be used with caution as HPC have highlighted that data from this site for 2014 may not be representative due to possible mishandling and reporting of data. Both reports have identified receptors close to the CE91 NO_2 diffusion tube (see Figure B 3 and Figure B 4). Further to this, as previously stated in Table A 1 and Table A 2, an additional modelling scenario should be undertaken to assess the cumulative impacts on identified sensitive receptors. This should be undertaken using data from the meteorological and background concentration sources stated above, as well as using cumulative traffic data.

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A.4 Additional Information

Table A 4: Additional information submitted to HPC influencing both proposed developments and AQAs

Additional Information	Report	Comment and Recommendation
A transport statement was submitted by CBO on 21 August 2017 to HPC as part of planning application 17/4034M. The transport statement proposes the development of a roundabout on Chelford Road at the site entrance of the proposed development (Figure B 5).	BWB	If planning permission was granted to both planning applications, due to the location of the proposed roundabout (Figure B 5) as part of 17/4034M planning application, it would impact traffic flows and therefore traffic emissions from the 'southern proposed development' associated with planning application 17/4034M and the 'northern proposed development' assessed in the BWB AQA. The BWB AQA was submitted 8 days before the transport statement on 29 August 2017 in relation to another planning application, 17/4277M. Therefore, it is unlikely that BWB were aware of this proposed change to the road layout adjacent to the proposed development. With this new information now available, the BWB AQA needs to be revised by assessing the potential impacts the changes in the road layout could have on the traffic flow and emissions from the proposed development on the local area.
	REC	The REC AQA should identify the proposed change in the road layout at the proposed development site entrance on Chelford Road (Section A.2, Table A 2).

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Additional Information	Report	Comment and Recommendation
Submission of a design, access and supporting statement[9] which included additional highways information on 06 February 2018 for planning application 17/4034M. The information included proposed changes to the Broken Cross roundabout if planning application 17/4034M was accepted.	BWB and REC	The submission of a change in the road layout would be on a stretch of road that would be used by traffic from both northern and southern proposed developments considered in this review (Figure B 7). However, this proposed change to the Broken Cross roundabout was submitted after the submission of both AQAs, thus was not considered in either AQA. Therefore, it is advised that both AQAs are revised and assess the potential impacts that the change in the road layout at Broken Cross would have on traffic flow and traffic emissions on sensitive receptors. This should include modelling scenarios presenting potential cumulative impacts on the Broken Cross AQMA.
Submission on 13 February 2018 of a design, access and supporting air quality statement[10] carried out by REC to planning application 17/4034M supporting the southern development.	REC	The design, access and supporting statement reiterates that within the REC AQA, potential impacts from the operational traffic emissions were identified at sensitive receptors along the affected road network throughout the area of Macclesfield and within the Broken Cross AQMA. The supporting air quality statement does not give any new points on the overall impact that the northern proposed development could have on the local area. Therefore, comments made on the original REC AQA presented within Table A 2 should be considered.

[9] CBO Transport 2018: Review of Broken Cross Junction and Objection by Henbury Parish Council
[10] REC 2018: Broken Cross Road Improvements – Air Quality Comments.

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Appendix B

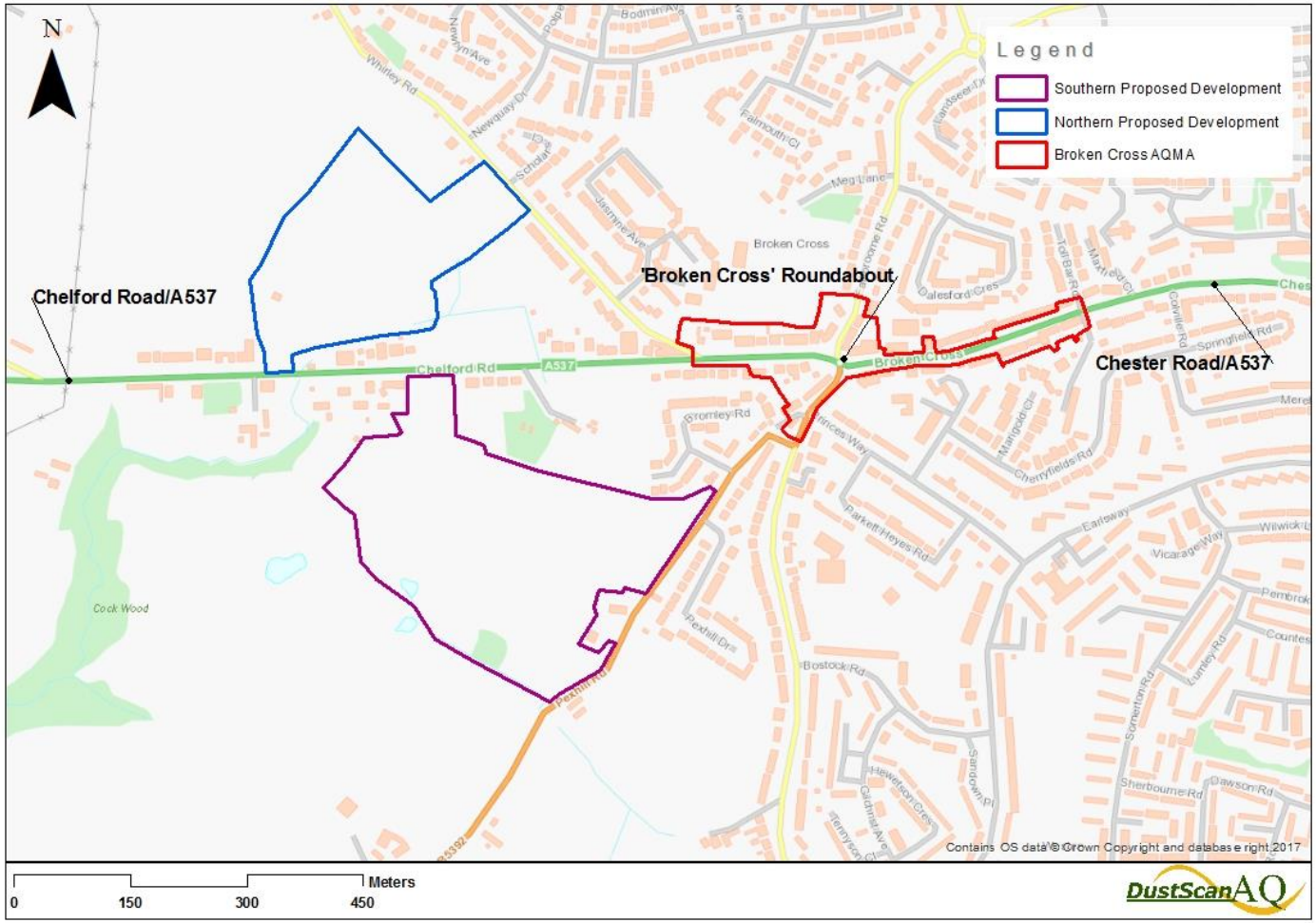

Figure B 1: Location of both proposed developments and Broken Cross AQMA

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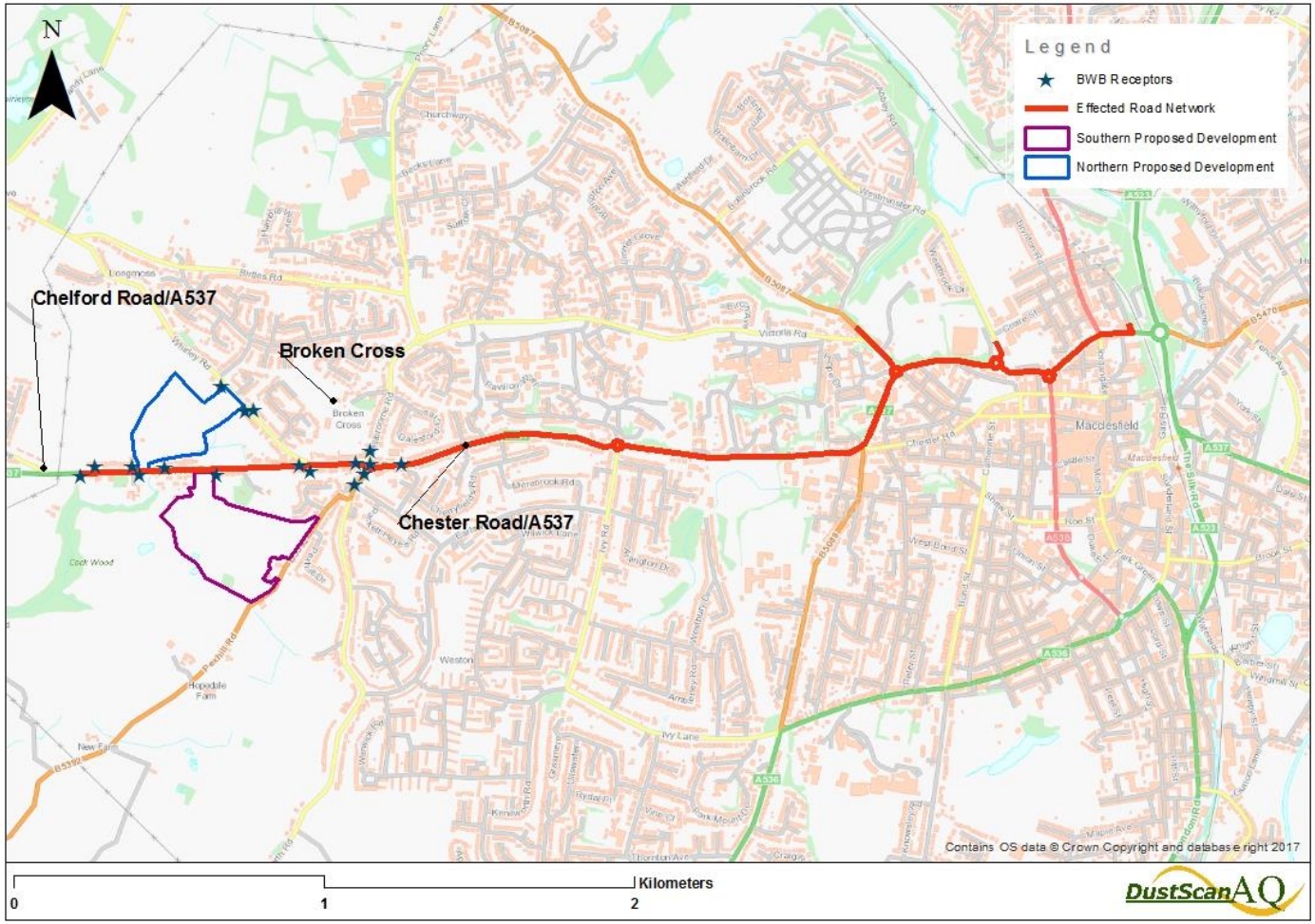

Figure B 2: Location of BWB sensitive receptors and affected road network from the 'northern proposed development'

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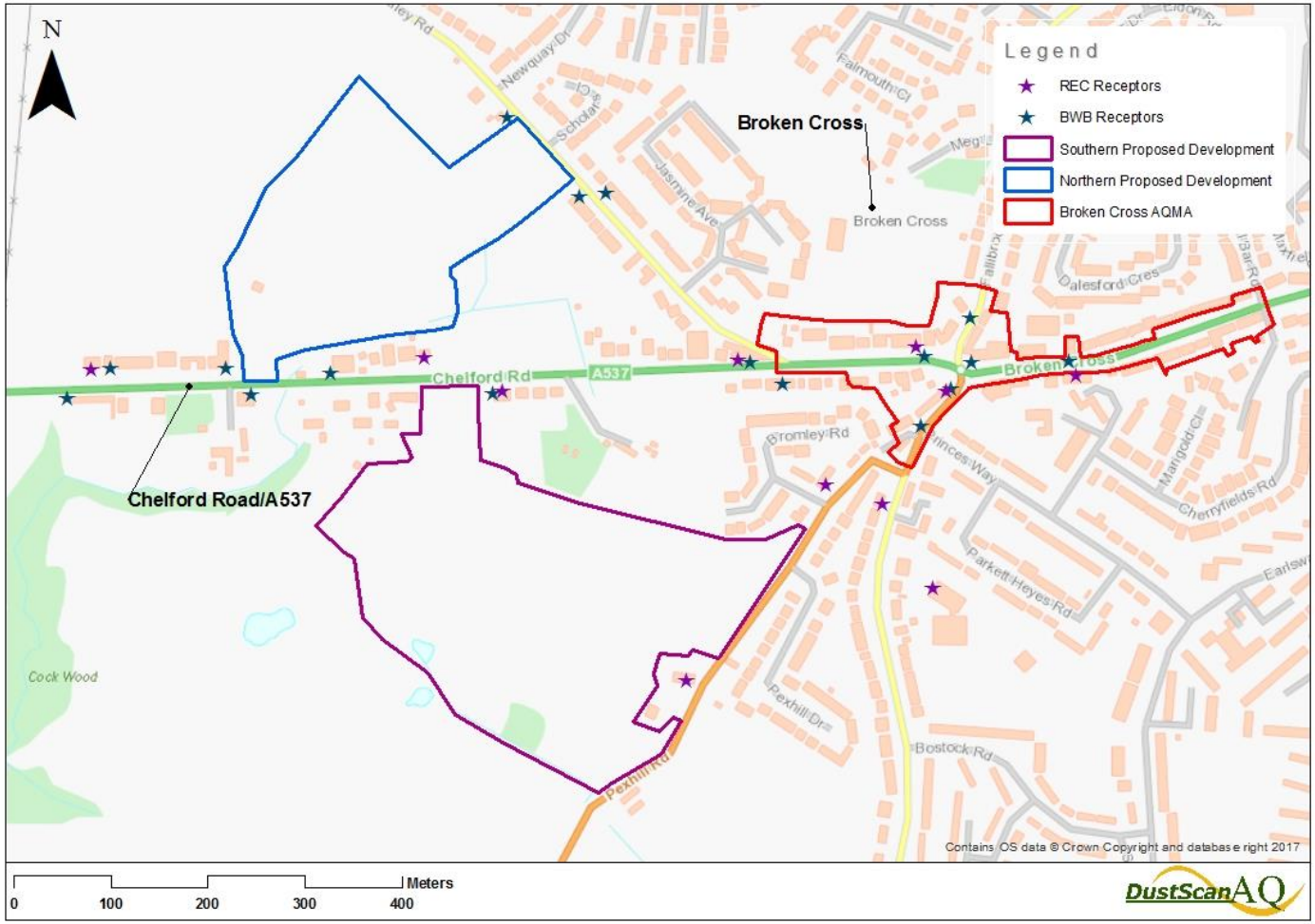

Figure B 3: Identified sensitive receptors within the Broken Cross AQMA

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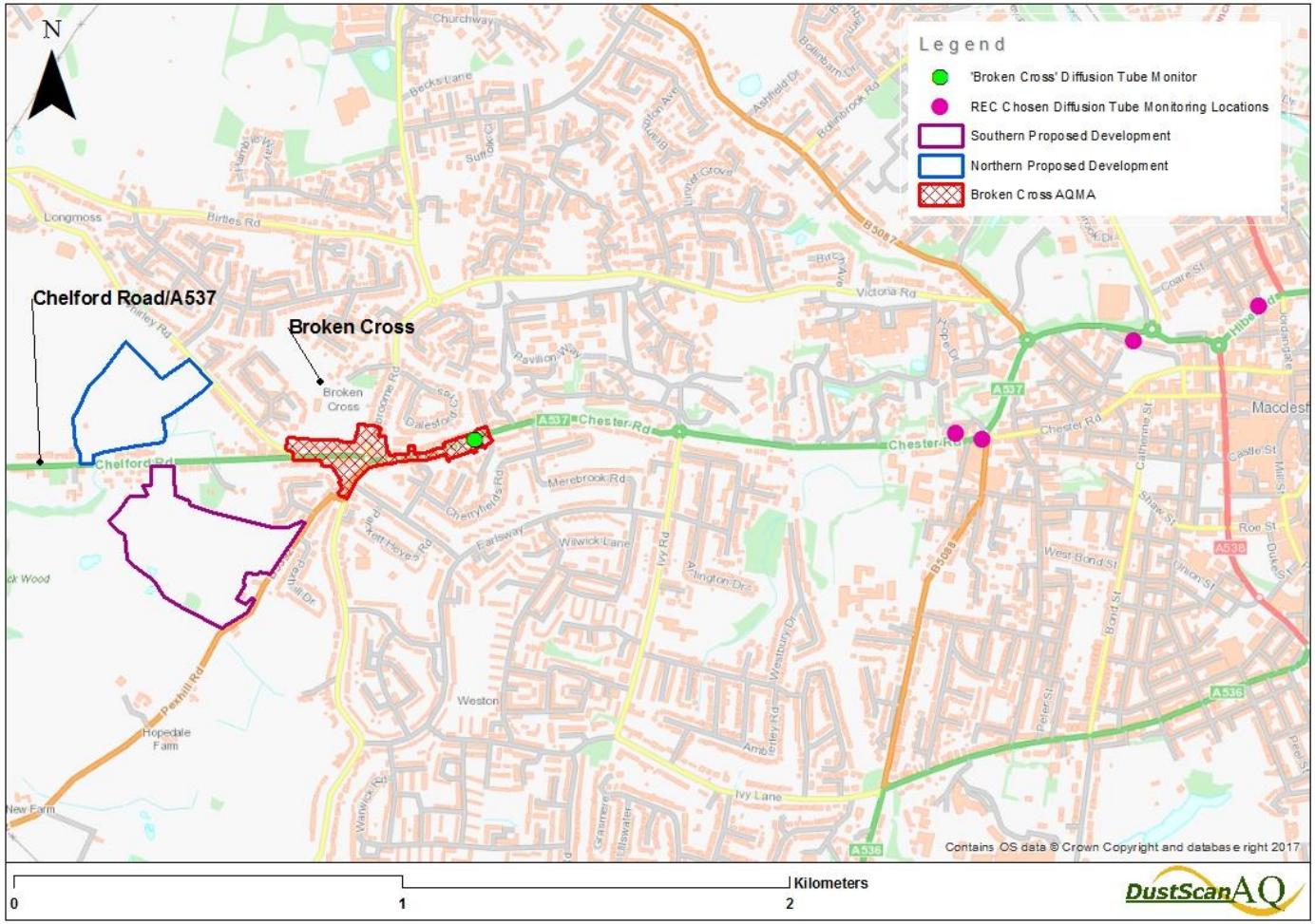

Figure B 4: Location of diffusion tube monitoring locations set up by CEC and the diffusion tubes used by REC AQA

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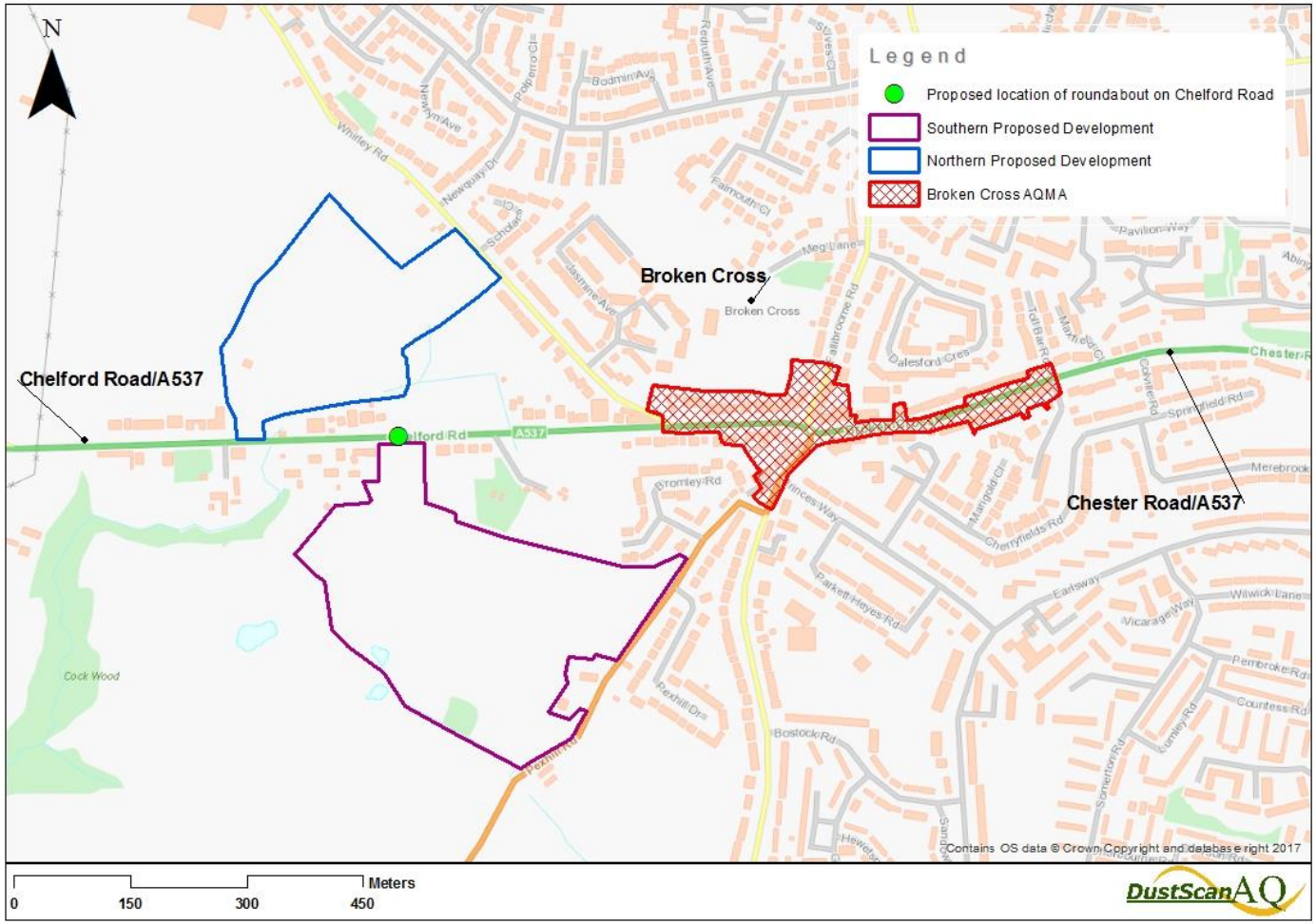

Figure B 5: Proposed roundabout at the site entrance on Chelford Road from 'southern proposed development'

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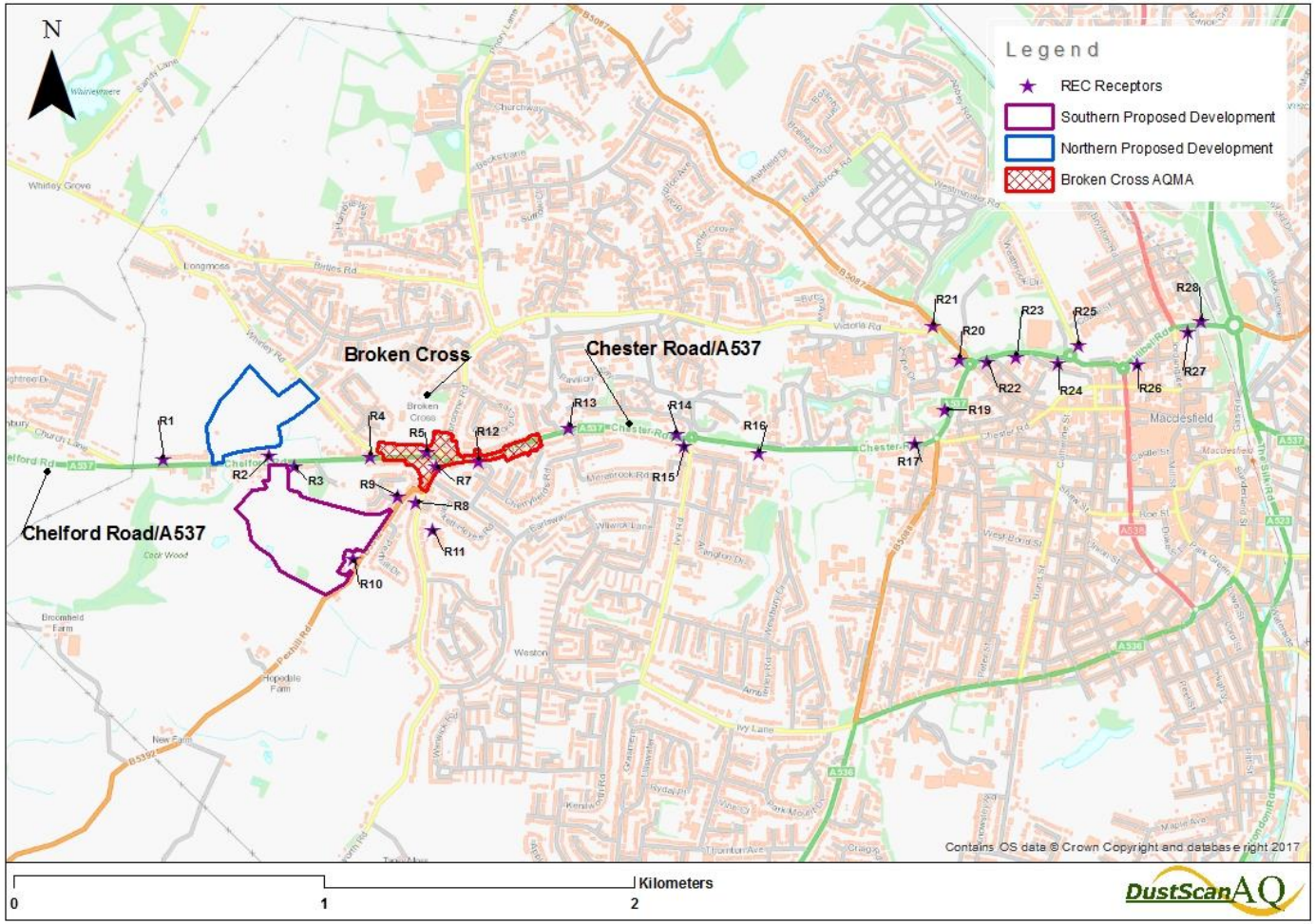

Figure B 6: Locations of sensitive receptors identified in the REC AQA

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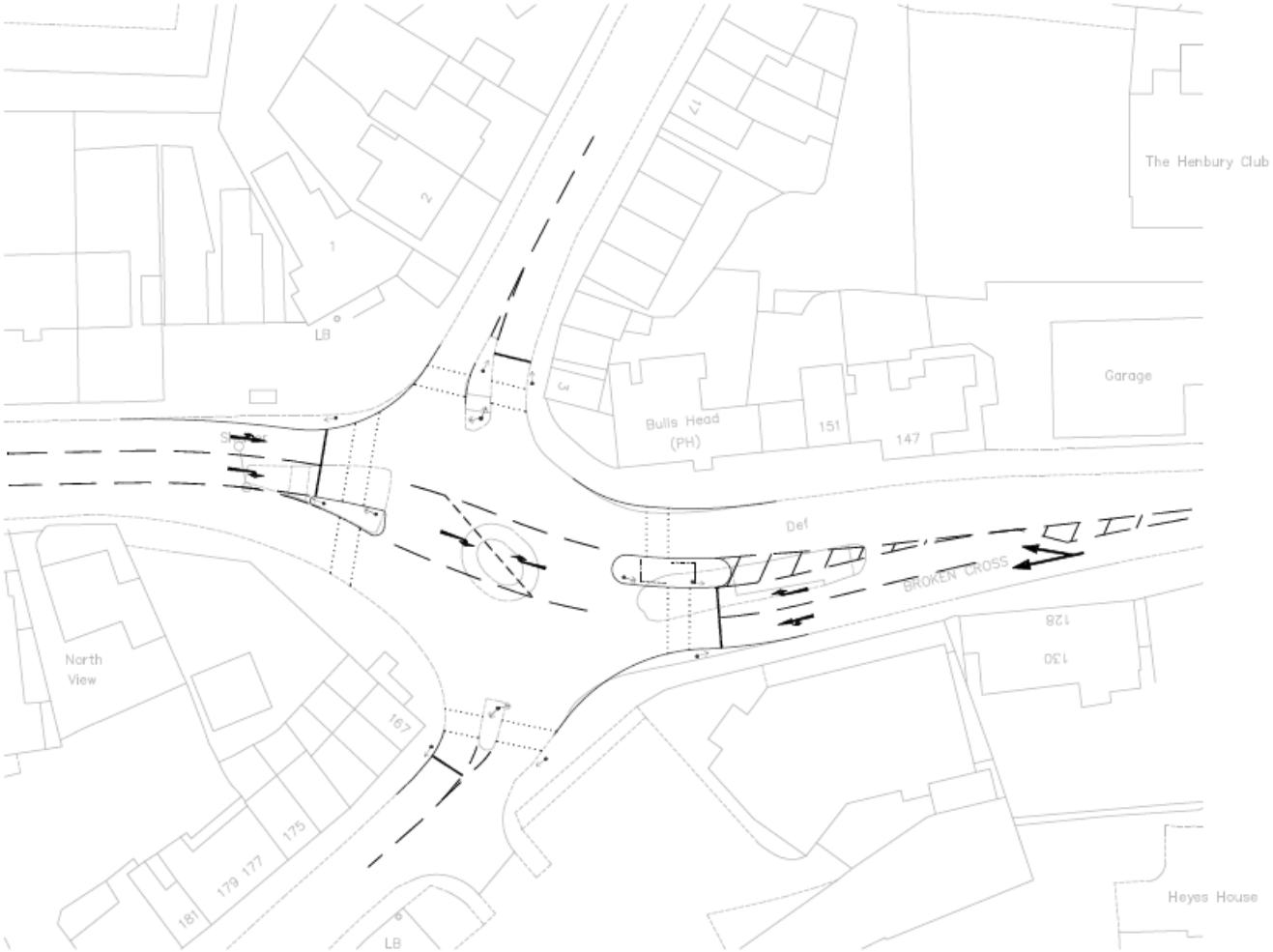

Figure B 7: Proposed changes to the road layout at the Broken Cross roundabout

Source: CBO Transport 2018: Review of Broken Cross Junction and Objection by Henbury Parish Council

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Appendix C

Table C 1: IAQM impacts descriptors table

Long term average Concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Explanation

1. AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'.
2. The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5%, will be described as Negligible.
3. The Table is only designed to be used with annual mean concentrations.
4. Descriptors for individual receptors only; the overall significance is determined using professional judgement (see Chapter 7). For example, a 'moderate' adverse impact at one receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.
5. When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme;' concentration for an increase.
6. The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure less than 75% of this value, i.e. well below, the degree of harm is likely to be small. As the exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL.
7. It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it.

Source: IAQM 2017: Land-Use Planning and Development Control: Planning for Air Quality.