Air Quality Proof of Evidence for Breedon Quarry Extension

1 Introduction

1.1 This proof of evidence statement is prepared for Save our Green Spaces Dinbych (SOGS) in regard to the Planning Appeal by Breedon Southern (the Appellant) following the refusal by Denbighshire County Council (DCC) of their proposed extension to Denbigh Quarry (PEDW reference CAS-03423-V9Z8M3).

1.2 This statement summarises my determination that the extension of the Denbigh quarry would be detrimental to the public's health, may increase population mortality, and has the potential to increase the financial burden of healthcare in the surrounding area because of its impact on air quality.

1.3 The statement will be set out in the following sections: my qualifications; research on the general negative health impacts of quarries; the specific negative health impacts of the proposed Denbigh quarry extension; and the lack of consideration of the impact on public health in the Appellants' proposal.

2 Qualifications

2.1 My name is Dr. Charles Allan McCoy, and I am an Assistant Professor of Public Health, Psychology, and Sociology at the University of Nottingham, Medical School at Derby. I have a doctorate degree (PhD) from the University of Virginia in the United States.

2.2 I teach public health (including environmental public health), behavioural sciences, and medical ethics to medical students in the Graduate Entry to Medicine (GEM) and Medicine with a Foundation Year courses at University of Nottingham. As well, I am the lead module convenor for the "Public Health" module for the Foundation Year course. I have conducted public health research for the past 15 years.

2.4 I have prepared this statement after reviewing relevant documents submitted by the Appellant and DCC to the DCC Planning Portal and PEDW Casework Portal, as well as SOGS research documentation.

3. Statement of Truth

3.1 I confirm that the statements I have made in this document are, to the best of my knowledge and belief, true. The claims in this document represent my professional genuine view, based on the information I had available to me at the time of writing.

4. General Negative Health Impacts for Communities near Quarries

4.1 Below I summarise relevant research on the negative health and economic impacts that stone quarries have on their surrounding communities.

4.2 Ziarati et al.[1] examined the health impacts in terms of air quality of residents of Wasperton, Warwickshire. Similar to Denbigh, in Wasperton sensitive receptors, such as residential homes and a secondary school are located roughly 700 metres away. The study looked at the impact of the quarry itself and transport to and from the quarry. Over half (4 out 7) of the air monitoring recordings showed that the school experienced elevated levels of PM_{10} for an average of 22.4 μg/m^3. This is significantly above the World Health Organisation (WHO) limit of 15 μg/m3.[2] There were similarly elevated levels of NO_2 and $PM_{2.5}$. The authors note the damaging health impacts on respiratory and cardiovascular systems such as bronchitis, asthma, lung cancer, COPD and stroke that this likely produces.

4.3 Research from other parts of the world show similar negative health impacts for residents near stone quarries. Researchers[3] examined the potential impact of the expansion of the Miller Braeside stone quarry in Braeside, Ontario, Canada. The village of Braeside is situated 3km away from the quarry – a much further distance than in Denbigh. Modelling the impact of the expansion on "total suspended particulates"

[1] Ziarati, R., Al-Habaibeh, A., Barzegarsedigh, A., Shakmak, B., & Singh, L. (2021). The Impact of Quarrying Activities on Air Quality and Public Health: A Case Study in Warwickshire.

[2] World Health Organization. (2021). *WHO global air quality guidelines: particulate matter (PM2. 5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide*. World Health Organization.

[3] Abdul-Wahab, S. A., Fgaier, H., Elkamel, A., & Chan, K. (2015). Air quality assessment for the proposed Miller Braeside quarry expansion in Canada: TSP. *Air Quality, Atmosphere & Health*, *8*, 573-589.

they found that the quarry should not be expanded as it posed a "severe hazard to human health" via its impact on air quality.

4.4 Researchers[4] show a stone quarry near Ho Chi Minh, Vietnam in 2018 caused over 10,000 avoidable medical examinations and treatments and over 4000 avoidable deaths. The health cost impacts of the quarry was just over £11.87 million pounds.

4.5 Researchers[5] looked at the environmental impact and air pollution from quarries in Europe, including the United Kingdom. The authors find that the dust generated from limestone quarries, like the Denbigh quarry, significantly affect air quality and present serious health risks such as respiratory disease, and that in the United Kingdom PM_{10} represents the big health risk produced from quarries.

4.6 Lastly, the Royal College of Physicians produced a report[6] finding that air pollution, such as from particulate matter from quarries, cost £500 million pounds a week in terms of NHS care, ill health, and productive losses. Similarly, Public Health England (PHE) found it cost the government £157 million pounds to treat the health impacts from $PM_{2.5}$ and NO_2 air pollution in 2017 and that this cost could reach £18.6 billion by 2035. PHE estimate that there could be 2.5 million new cases of coronary heart disease, stroke lung cancer and child asthma if current levels of air pollution persist.[7]

4.7 It is because of the negative health impact on health, that the Planning Policy Wales (2024) document states: "Nitrogen dioxide and particulate matter, which are the pollutants of primary national concern from a public health perspective, **currently have no safe threshold defined and therefore the lower the concentration of those**

[4] Bui, L. T., Nguyen, P. H., & Nguyen, D. C. M. (2020). Model for assessing health damage from air pollution in quarrying area–Case study at Tan Uyen quarry, Ho Chi Minh megapolis, Vietnam. *Heliyon*, *6*(9).

[5] Fugiel, A., Burchart-Korol, D., Czaplicka-Kolarz, K., & Smoliński, A. (2017). Environmental impact and damage categories caused by air pollution emissions from mining and quarrying sectors of European countries. *Journal of cleaner production*, *143*, 159-168.

[6] Holgate, S. T. (2017). 'Every breath we take: the lifelong impact of air pollution'–a call for action. *Clinical Medicine*, *17*(1), 8-12.

[7] Public Health England. (2018, May 22). *New tool calculates NHS and social care costs of air pollution*. GOV.UK.

pollutants the lower the risks of adverse health effects. It is desirable to keep levels of pollution as low as possible."[8] [Bold added] Allowing the expansion of the quarry would go against this recommendation from the Welsh government planning.

4.8 In summary, scientific research clearly shows that there is a negative health impact on the public's health by living near a quarry. Further, air pollution produced by quarries are linked to a series of negative economic impacts because of the negative impact that they have on health. In view of this research, the expansion of the Denbigh quarry would have a negative impact on the surrounding community's health and economics.

5. Specific Negative Health Impact of the Breedon Quarry Extension

5.1 Beyond the fact that general research on communities living near quarries strongly indicates that those communities suffer negative health and economic impacts, there are specific negative impacts related to the proposed extension of the Denbigh quarry.

5.2 In a 2021 document[9] the World Health Organisation (WHO) set a limit of 5 μg/m^3 for $PM_{2.5}$. This limit has been endorsed by the UK government. The Committee on the Medical Effects of Air Pollutants' document "Advice on health evidence relevant to setting $PM_{2.5}$ targets – update" states, "The new guideline for annual average concentrations of PM2.5 is 5 μg/m3.[10]

5.3 The WHO guideline was created from a systematic review by Chen and Hoek (2020)[11] that found that communities with $PM_{2.5}$ levels higher than 4.9 had overall higher rates of non-accidental mortality. Further, cause specific mortality related to air quality was

[8] Welsh Government. (2024, July 19). *Planning Policy Wales* (12th ed.). p. 170-171 Retrieved from https://www.gov.wales/planning-policy-wales

[9] World Health Organization. (2021). *WHO global air quality guidelines: particulate matter (PM2. 5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide*. World Health Organization.

[10] UK Health Security Agency. (2021, July 15). *Advice on health evidence relevant to setting $PM_{2.5}$ targets* (COMEAP), Section 10, page 1. GOV.UK. https://www.gov.uk/government/publications/fine-particulate-air-pollution-pm25-setting-targets

[11] Chen, J., & Hoek, G. (2020). Long-term exposure to PM and all-cause and cause-specific mortality: a systematic review and meta-analysis. *Environment international*, *143*, 105974.

also higher in these communities, indicating that the relationship between mortality and $PM_{2.5}$ was causal. The UK government's document "Health Matters: Air Pollution" (2018)[12] likewise states that excessive levels of $PM_{2.5}$ is related to increased respiratory illness, cardiovascular illness, asthma, hospital admissions from respiratory and cardiovascular illness, and increased levels of mortality.

5.4 The Appellant's own "Volume 2 - Environmental statement" shows that the Defra Modelled annual impact of the proposed quarry extension is for $PM_{2.5}$ is 5.3 (2019) and 5.2 (2020) $\mu g/m^3$ – over the limit that the WHO sets, and the UK government endorses.

5.5 Also, the Appellant's "Denbigh Quarry Dust Impact Assessment" document shows that the existing quarry also exceeds the WHO limit. On page 13, Table 4-4 shows that for monitoring location 1 for the period 24/08/2021 - 24/09/2021 the maximum $PM_{2.5}$ was 29.12 and the mean was 10.87. For monitoring location 2 for the period 24/08/2021 - 24/09/2021, the maximum $PM_{2.5}$ was 28.56 and the mean was 10.40. Both of these averages are **twice** the WHO's limit of 5 $\mu g/m^3$. As even the existing quarry is harmful to the public health of Denbigh, extending the quarry will further increase that harm.

5.6 There is a further issue of the minimum distance residential human receptors are located to the proposed extension of the quarry in Denbigh. The Welsh government's "Minerals Planning Policy (Wales) Minerals Technical Advice Note (Wales) 1: AGGREGATES", section 70 on "Buffer Zones" (p 29) [13], states that a minimum distance for a hard rock quarry should be 200 metres and that "The buffer zone should be defined from the outer edge of the area where extraction and processing operations will take place" (p.29). (Via email the Denbighshire County Council has similarly confirmed to SOGS that the distance should be measured from the "working area" boundary.) The Appellant's "Dust Impact Assessment" shows that there are a number of residential human receptors that are **less than 200 metres away** (see Table 4-1 on

[12] Public Health England. (2018). *Health matters: Air pollution*. https://www.gov.uk/government/publications/health-matters-air-pollution

[13] Welsh Assembly Government. (2004, March). *Minerals Technical Advice Note (Wales) 1: Aggregates* [MTAN 1]. Cardiff: Welsh Assembly Government.

page 8- 9); one resident (ID = HR13) lives only 61 metres from the boundary. The fact that human receptors are within the 200 metre appears to be in contravention to the rules set forth by the Welsh government as outlined in the above document.

5.7 The UK's Health and Safety Executive agency states that when performing their operations quarries should implement control measures to ensure that dust not reach a level where it can cause harm.[14] Common methods of control are water-based dust suppression.[15] Indeed, the Appellant's "Dust Impact Assessment" states that water suppression will be in use during quarry operations (see sections 5.3.2.2; 5.3.2.4 5.41; 5.5.1;). Yet, Appendix A shows three photos of quarry operations at the Denbigh quarry provided by SOGS, dated 04/07/2025 at 13:36, in which it appears that dust control measures, such as water-based suppression, are not being used.

5.8 Furthermore, there is evidence that the Appellant has also not followed rules regarding the sheeting of lorries. Lorries carrying stone from quarries are required to be covered in order to prevent spillage and the generation of dust that may harm air quality (see the "Sheeting and Unsheeting" factsheet from the UK's Health and Safety agency[16]). On the 18th of June at approximately 12:34 a photo, provided by SOGS, of an un-sheeted lorry leaving the Denbigh quarry was taken on FFordd Y Graigg road by a Denbigh resident (see appendix B at the end of this statement). Not only are uncovered lorries against government regulations, they also harm the public health of Denbigh residents by reducing air quality.

5. 9 The Appellant's own Environmental Statement declares that the quarry extension will hurt the amenity of community and produce negative health impacts, stating: "The main potential impact associated with the Proposed Quarry Extension is dust

[14] Health and Safety Executive. (2024, October 29). *Dust and silica* [Web page]. HSE. https://www.hse.gov.uk/quarries/hardtarget/dust.htm; Health and Safety Executive. (2024). *Control of exposure to silica dust: A guide for employees* (Leaflet INDG463) [PDF]. HSE. https://www.hse.gov.uk/pubns/indg463.htm

[15] Air Spectrum Environmental Ltd. (2024). *Mines, Quarrying and Haul Road Dust Control*. Retrieved July 8, 2025, from https://www.airspectrum.com/about-us/sectors/mines-quarrying-haul-road/

[16] Health and Safety Executive. (2023, November 14). *Sheeting and unsheeting* [Factsheet]. UK Health and Safety Executive. https://www.hse.gov.uk/workplacetransport/information/sheeting.htm

deposition which may lead to **disamenity** due to the soiling of surfaces. **There may also be an increase in particulate matter (PM_{10}) concentrations local to the site which may affect human health."** [Bold added] (p. 82-83). Yet, "Volume 3 – Non Technical Summary of Environmental Statement" omits this finding and instead simply states: "2.4.15. The outcome of the assessment is that the air quality effect is "not significant" (p. 6).

6 Lack of Consideration of Health Impacts in the Proposal.

6.1 In addition to the negative health impacts of the expansion of the Denbigh quarry, I find that the Appellant has not properly considered the health impacts of the expansion of the quarry, as they are required.

6.2 Section 75 "Minerals Technical Advice Note (Wales) 1: Aggregates"[17] on "Dust" states: "The Better Health Better Wales Strategic Framework…makes a clear commitment to develop the use of health impact assessment in Wales. **The potential impact on health must always be considered in relation to proposals for aggregates extraction and a health impact assessment should be carried out for any proposal for a new quarry or sand and gravel pit located within one kilometre of an existing community.**" (Section 75, p. 31). There is no evidence of a health impact assessment (HIA) being carried out by the Appellant as instructed by the Welsh government.

6.3 Also, there is no evidence of a health impact assessment on particularly vulnerable receptors such as children and the elderly. This is notable as there is a primary school and daycare centre that is approximately 1km from the site. Moreover, there is no evidence of an assessment of the potential health impact of crystalline silica, which is a known health hazard from limestone quarries such as in Denbigh.

6.4 There is emerging legislation requiring health impact assessments to be conducted for public bodies in Wales as part of the Public Health (Wales) act 2017 (see "Health

[17] Welsh Assembly Government. (2004). *Minerals Technical Advice Note (Wales) 1: Aggregates* (Section 75). Cardiff: Welsh Assembly Government.

Impact Assessment Regulations" www.gov.wales/health-impact-assessment-regulations) that will soon be implemented. This shows that health impacts assessments are becoming part of the routine part of planning applications.

6.5 There is no evidence of reports on the potential health impacts of specifically for PM_{10}s and $PM_{2.5}$s produced from the quarry extension. Surprisingly, the Appellant's own environmental statement states that: "**Dust deposition monitoring is not undertaken at the existing quarry or within the study area."** (8.3.5). Instead of site-specific dust monitoring, it appears that the Appellant has merely relied on background estimates and has assumed mitigation will be effective. The Institute of Air Quality Management (IAQM) states that PM_{10}s needs to be assessed if there are sensitive receptors within 1km, which is the case for Breedon Denbigh Quarry.[18]

6.6 Also, it is unclear whether the Appellant has carried out an air quality assessment specifically for the proposed extension of the quarry. It appears, that the application (see page 65 onward of the applicants Environmental Statement) used a baseline air quality measurements obtained from the 2018 version of the Combined Authority of North Wales Air Quality Progress report and then results in the report are than extrapolated from that. Further, Appendix 6 of Environmental Statement appears to use a different baseline measurement than that used in the statement. Also, the source of the data is not included and thus cannot be verified.

6.7 In their objection to the extension, Bimeda similarly note that the Appellant's environmental statement lacks, "robust and relevant technical evidence, detail and data which means the proposal lack credibility" (see "Bimeda Objection letter").

6.8 Further, the Appellant's "Volume 3 – Non Technical Summary of Environmental Statement" makes no mention of health at all. Again, in the Appellant's "Response to

[18] Holman, C., Datson, H., Dawson, M., Pullen, J., Srimath, S., Stoaling, M., ... & Wilson, P. (2016). Guidance on the Assessment of Mineral Dust Impacts for Planning. *London: The Institute of Air Quality Management*.

Statement of Case of Denbighshire County Council" there is similarly no mention of the potential health impacts of the quarry.

6.9 The Appellant's "Denbigh Quarry Dust Impact Assessment" states: "**In relation to dust, the Site are not aware of any recent dust complaints."** However, over half of the objections raised to the quarry by Denbigh residents raise the issue of dust. Further, SOGS has been informed by residents that they have specifically complained to the Appellant about dust, but have received no response.

6.10 All the above suggest that the Appellant has not fully assessed the potential health impacts of the quarry extension as mandated by the Welsh government. "Planning Policy Wales 2024"[19] advocates for the consideration of public health in the planning process (see section 3.24). This does not appear to have occurred in the case of the application to extend Denbigh quarry.

7 Summary

7.1 It is my determination that the expansion of the Denbigh quarry would be detrimental to the public health of Denbigh because of its impact on air quality. Indeed, it may potentially increase the level of mortality among residents. Further, it appears that the Appellant has not properly assessed the potential for negative health impacts in their proposal or appeal. Lastly, the negative health impact of the proposed expansion of the Denbigh quarry will likely produce a significant negative economic impact.

7.2 This last point is relevant as part of the basis of the Appellant's proposal is the economic benefit of the proposed extension of the quarry; the Appellant has claimed in the application form that the extension will include 6 full time employees. Yet this economic effect will likely be vastly outweighed by the negative economic impact of the harm to public health that the proposed extension of the quarry will likely

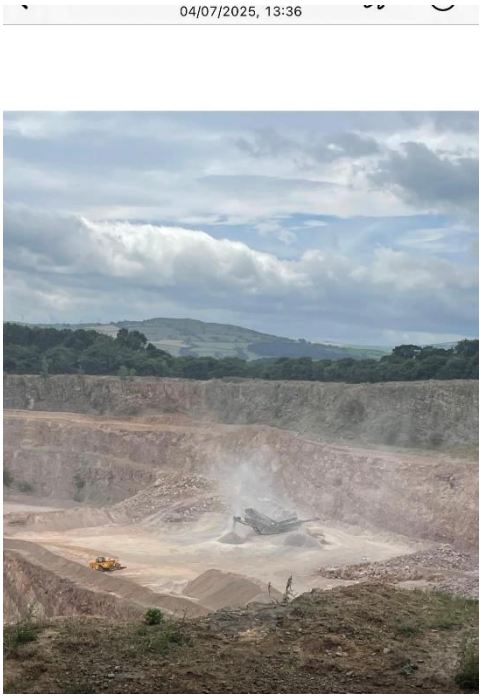
[19] Welsh Government. (2024, February). *Planning Policy Wales* (12th ed.). Welsh Government. https://gov.wales/planning-policy-wales (Last updated July 19, 2024)

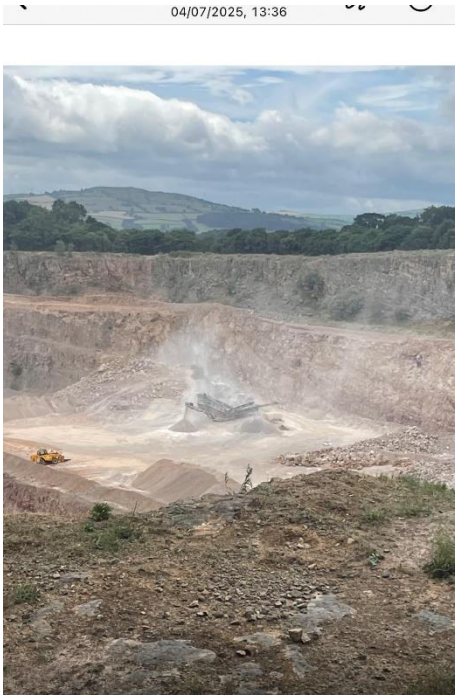
produce. During a time in which the NHS has limited resources, the extension of the Denbigh quarry will potentially produce further strain on local health resources.

7.3 Lastly, there is emerging legislation that may influence the appeal. Petition “P-06-1476: 1000 metre mandatory buffer zone for all new and existing quarries” is currently being debated in the Senedd. This petition would not only require there to be a 1000-meter buffer zone, but would require the risk to the public health to be officially assessed during the planning process. If this emerging legislation is passed, the Denbigh quarry extension would be in contravention against both of these regulations.

7.4 For the reasons listed, my strong recommendation to the Inspector is that the Appellant ‘s appeal should not be granted.

Appendix A – Three photos of the Appellant's quarry operations dated 04/07/2025 at 13:36 in which it does not appear that dust control measures are being used.





Appendix B – Two photos of an uncovered lorry leaving Breedon Denbigh Quarry — Aggregates on FFordd Y Graigg road on the 18th of June, 2025, approximately 12:34pm.