

**COMMENTS ON THE ATKINS DRAINAGE ASSESSMENT REPORTS DATED  
NOVEMBER 2021 & AUGUST 2023 - LA05/2022/0033/F**

**QUARTERLANDS GROUP MARCH 2024**

1. The following concerns have been identified in our review of the above Reports. Essentially, both reports are very similar with the more recent version addressing site changes resulting from the plan to build affordable housing on the site. There are differences within the Appendices but Appendix F and G which are of concern to us, and will be addressed later, are common to both Reports.
  
2. We believe that Planners must address the issues highlighted below given the Department of the Environment's Planning and Flood Risk Policy (Revised Planning Policy Statement 15, September 2014) which recognises issues associated with climate change and the need for preventative measures as set out in the following paragraphs and in the five Appendices to the Policy:

*'1.4 Climate change predictions of rising global temperatures will be accompanied by sea level rise, an increase in overall winter precipitation and an increase in intensity and duration of extreme rainfall events. This, along with other factors such as the ongoing development of impermeable surfaces in urban areas, removal of vegetation and loss of open space, will, if continued, greatly increase the incidence of surface water flooding.'*

*1.5 The significant increase in the incidence of flood events across Europe and the associated impacts led to the adoption by the European Parliament of the Floods Directive ("The Assessment and Management of Flood Risk") in October 2007. The Directive sets out a holistic, catchment-based approach to manage flood risk in a sustainable way based on the impact all sources of flooding have on human health, the environment, cultural heritage and economic activity. The ongoing implementation of the Directive in Northern Ireland, by Rivers Agency (DARD) as the competent authority, has resulted in a significant improvement in the body of flood information now available. Accordingly, our understanding and ability to predict flood risk is continually improving.'*

*1.6 The Directive confirms that development and other man-made changes to the environment can exacerbate the consequences of flooding. Accordingly, one of the Directive's outcome measures relates to flood prevention. The land use planning system therefore plays an important role in flood risk management insofar as it has a significant bearing on where development takes place and as a consequence can prevent or restrict new development in flood prone areas.'*

3. A comparison of the Atkins Reports with a Report prepared by Flood Risk Consulting in respect of one dwelling and garage at Lands 30M N of 75 Dromore Road, Hillsborough in respect of planning application LA05/2017/1038/O received by LCCC's Area Planning Office on 2 July 2018 highlights significant difference in the respective standard of these drainage assessment reports in terms of the quality of the data and the assessment methodologies.
4. The Atkins Reports relate to 17 dwellings within the Lagan Valley Regional Park, we have questions about their adequacy and the methodology used. Where are the photographic records, site visit records, review of lands in the wider area to provide '*information of the general levels of the land in the area of the study,*' (Para 4.5 of the Flood Risk Consulting Report) or the mathematical model specific to the proposed development at Quarterlands Road (LA05/2022/0033/F).
5. A Drainage Assessment in Northern Ireland is required under government guidance PPS 15 (FLD3) for all new developments that comprise 10 or more dwellings on a site which exceeds 1 hectare. A Drainage Assessment should include:
  - A site visit / walkover by a qualified OSM Environmental Consultant
  - Review of the site development proposals / planning application
  - Submission of a Schedule 6 agreement under the Drainage (NI) Order 1973
  - A detailed review of the current Revised Planning Policy Statement 15 (Policy FLD 3) in relation the proposed development
  - Calculation of the expected peak rainfall at the proposed site during a storm event
  - Calculation of the existing and proposed site surface water runoff
  - The production of a Drainage Assessment report and submission to planning Service
  - Provision of discharge options and application (if required).
6. The Atkins Reports state in the Notice sections that: '*Atkins Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.*' The extent of the disclaimer means that in the event that neighbouring households were to suffer a detriment because of action taken on the basis of the Report that they would have no recourse without a lengthy legal contest on the grounds that the disclaimer is overly broad.

7. The Notice section states that the '*document has 21 pages including the cover page*', in the November 2021 version. That Report has 56 pages. The August 2023 Report states there are 20 pages, when there are 54. Are there pages inserted to these Reports which are additional to the page numbers stated?
8. At Para 1.3 in the Atkins Reports the General Approach/Methodology is described. All of the actions described appear to be of a desk top or on-line nature. There is no suggestion that a site visit was undertaken.
9. Section 2 of the Atkins Reports details findings from the review which took place online of DfI Rivers Flood Hazard Maps, noting that they are publicly available. The Atkins Reports also rely exclusively on the site team for topographical information.
10. Para 2.2 of the Atkins Reports confirm that the site is not located within any of '*the Flood Directive flood maps*'. As it is not within a flood plain then the conditions set out at Para 4.1.3 of the November 2021 Report are critical. The Atkins Report states: '*Flooding of the storm drainage networks is limited to 1No. location during a 1 in 100- year rainfall event (4.695m<sup>3</sup>) and the water can be safely contained or conveyed away from adjacent buildings. Flood risk elsewhere is not predicted to increase due to the proposed development as the proposed discharge rate is limited to greenfield runoff. **The proposed development is therefore considered to be compliant with the requirements of PPS15 Policy FLD3.***' The August 2023 shortens the previous comment to: '*Flood risk elsewhere is not predicted to increase due to the proposed development as the proposed discharge rate is limited to greenfield runoff. **The proposed development is therefore considered to be compliant with the requirements of PPS15 Policy FLD3.***' The reason for truncating the previous comment is unclear.

There are a number of problems with the claim made in paragraph 4.1.3, which include:

- (i) it appears from the November 2021 Atkins Report that the storm drainage assessment was limited to one location within the proposed site;
- (ii) the August 2023 Atkins Report largely changes in terms of reclassification of the proposed dwellings from 17 detached to 15 detached and two semi-detached dwellings. **No site-specific information is provided to support conclusions reached;**
- (iii) at [Appendix 1](#) below we have attached Policy FLD3 Development and Surface Water (Pluvial) Flood Risk Outside Flood Plains which applies to this development given the comment at Para 2.2.

The criteria from this Policy which the Atkins Report does not address in relation to the proposed development are:

- the amount of hardsurfacing within the proposed development, either when the initial plans were assessed by Atkins or now that the plans have been amended, is not provided. It is, therefore, unclear whether the criterion 'A change of use involving new buildings and / or hardsurfacing exceeding 1000 square metres in area' which requires a full drainage assessment of the site has been met. Para 4.1.3 of the Atkins Report states: '*Flooding of the storm drainage networks is limited to 1No. location during a 1 in 100-year rainfall event (4.695m<sup>3</sup>) and the water can be safely contained or conveyed away from adjacent buildings. Flood risk elsewhere is not predicted to increase due to the proposed development as the proposed discharge rate is limited to greenfield runoff.*' We have underlined what appears to be a prediction rather than an actual assessment of the flood risk by Atkins;
  
- the Policy states: '*Where a Drainage Assessment is not required but there is potential for surface water flooding as indicated by the surface water layer of the Strategic Flood Map, it is the developer's responsibility to assess the flood risk and drainage impact and to mitigate the risk to the development and any impacts beyond the site.*' The Atkins Report at Para 4.1.3 concluded: '*Flood risk elsewhere is not predicted to increase due to the proposed development as the proposed discharge rate is limited to greenfield runoff.*' It is unclear whether the Atkins Report considered that no Drainage Assessment was required in respect of the total site.

We remain unclear what exactly is meant by Para 4.1.3 in respect of the conclusion that: '*Flooding of the storm drainage networks is limited to 1No. location during a 1 in 100-year rainfall event (4.695m<sup>3</sup>) and the water can be safely contained or conveyed away from adjacent buildings.*' What does this statement mean in terms of the comprehensive overview of the drainage assessment undertaken by Atkins?

- the Policy also requires: '*A Drainage Assessment will also be required for any development proposal, except for minor development, where:*'
  - *The proposed development is located in an area where there is evidence of a history of surface water flooding.*
  
  - *Surface water run-off from the development may adversely impact upon other development or features...*

We have provided verbal and photographic evidence of surface water flooding in the area. None of this evidence has been weighed in the Atkins Reports to inform its conclusions. We would also note that dwellings in the Rural Cottage area lie some two metres lower than the proposed development site. The potential for them to be adversely impacted by the proposed development is not addressed. Given the disclaimer stated in the Notice section

of the Report it appears to us that no regard was afforded to the likely impact of the proposed development on surrounding dwellings or lands.

(iv) photographic evidence has been provided of: the site itself, the Quarterlands Road, the visibility splay opposite the proposed development and the associated footpath all showing that the site is waterlogged and that the rain and runoff from the site causes flooding in the immediate area.

11. At Para 2.4.1 of the 2021 Atkins Report states that an Article 154 application had been submitted to NI Water a response had not yet been received when this Report was submitted. From the August 2023 Atkins Report (Para 2.4.1) a conditional response has been provided by NI Water? Has the developer complied with the conditions set out by NI Water in terms of the cost of £131,500 and has a non-refundable deposit of £10,000 been paid for the detailed design as recommended by R. Mooney, NI Water?

12. On what basis can Para 3.1 be asserted in both of the Atkins Reports? What is the source of the information underpinning this conclusion? What evidence was sought to confirm the conclusion! Why are sources not cited?

13. Para 3.2 in both Reports states that *'surface water runoff calculations are shown at Appendix F'*.

Appendix F shows no evidential basis directly related to the site, rather it is the application of The Modified Rational Method. The Background to the Method states: *'The Rational (or Lloyd Davies) method is in widespread use and provides a convenient and easily understood tool for design. Studies have shown the variable accuracy of the method as normally applied in the U.K. and recent research has suggested ways in which the method could be improved. A Modified Rational Method has therefore been included in the procedure for the design and analysis of storm drainage networks produced for the Doze/NWC Working Party on the Hydraulic Design of Storm Sewers.'*

It further notes that: *'Tests have shown that the Modified Rational Method is as accurate for the determination of peak runoff as some more sophisticated urban runoff methods. These tests were limited to urban catchments up to 150 ha in areas with times of concentration up to about 30 minutes and outfall pipe diameters up to about one metre. The slope and distribution of impervious areas in these catchments were reasonably uniform. The accuracy of the method when applied to larger or more irregular catchments is not known and therefore the method cannot be positively recommended outside these limits.'* (Page 4 The Standing Technical Committee on Sewers and Water Mains, Working Party on the Hydraulic Design of Storm Sewers, Design and Analysis of urban storm drainage, The Wallingford Procedure Volume 4

The Modified Rational Method, Department of the Environment National Water Council, Standing Technical Committee reports No 31)

It is apparent that the size of the site and its rural setting raises questions regarding the accuracy of applying the methodology given the caveats set out at Page 4 and reproduced above. Additionally, in our opinion, the criteria set out at Paragraph 3 regarding data collection etc are not met.

14. Comment on Estimation of Greenfield Site Runoff Rates provided by A.M Cawley (Hydro Environmental Ltd. Galway) and C. Cunnane (Department of Engineering Hydrology, University of Galway) found: *'In the context of Sustainable Urban Development it is often necessary to estimate design flood runoff from pre development (Greenfield) areas. At present such flood rates are calculated by either a rational method type approach or by a flood estimation formula which is based on catchment characteristics, such as those in FSR/FEH. These formulae are based on data from natural river catchments. Many development sites are of small area, relative to natural river catchments, and do not form complete natural catchments in themselves, many without any surface water features. These differences seriously weaken the applicability of such catchment type formulae to a typical development site. Results of a range of analyses are outlined which demonstrate the difficulties arising from the use of such methodology.'* This study found that: *'The estimation of peak flows on small to medium sized rural catchments is probably the most common design problem in flood estimation and often poses the greatest difficulty due to absence in the majority of cases of gauged (observed) flow data.'* It further stated that: *'It is not possible to define precisely what is meant by small and medium sized catchments, but limits of 5 to 25km<sup>2</sup> and 100 to 1000km<sup>2</sup> can be taken as general guides.'* ([https:// hydrologyireland.ie/wp-content/uploads/2020/12/2-Comment-on-Estimation-ofGreenfield-Runoff-Rates-E\\_Cawley-Cunnane.pdf](https://hydrologyireland.ie/wp-content/uploads/2020/12/2-Comment-on-Estimation-ofGreenfield-Runoff-Rates-E_Cawley-Cunnane.pdf))
15. Clearly, the size of the proposed development site makes the use of the models used in the Atkins Reports unreliable. Cawley and Cunnane noted: *'Ungauged flood estimation is considerably more difficult on smaller catchments than larger ones as the variability in runoff characteristics (slope, soil, land use, surface drainage network) become more pronounced and have a more significant effect. The recent introduction of stormwater management for urban drainage systems has resulted in a requirement for flood estimation at much smaller scales, at the local drainage area scale of 1 to 2 km<sup>2</sup> down to the field plot scale of 1 to 10ha (0.01 to 0.1km<sup>2</sup>). These are required to assess the pre- development (natural greenfield) and post-development runoff rates. Unfortunately, the flood estimation techniques available have not made nor in a lot of cases capable of making this transition to the finer scales. The difficulty becomes more pronounced when the scale is such that the project site does not exhibit any watershed features such as a watercourse or discharge outlet point causing some variables in these flood estimation formulations no longer have a meaning.'*

16. We consider the use of the methodology set out in Appendix F given the size of the site and the known difficulties of applying modelling in such a context as this demands that site specific measures are carried out. As Cawley and Cunnane note: *'These are required to assess the pre-development (natural greenfield) and post-development runoff rates. Unfortunately the flood estimation techniques available have not made nor in a lot of cases capable of making this transition to the finer scales.'* As those most impacted by the consequences of employing methodologies not capable of delivering accurate results we seek a comprehensive Drainage Assessment Report prior to this application coming before the Planning Committee. It is worrying to us that these methodologies were employed without their limitations being acknowledged within the Atkins Reports.
17. In neither of the Atkins Reports does Para 3.3 provide information about why a Storm Drain Design prepared for Woodcoste Grove, Ashley Road, Epsom, Surrey, KT18 5BW is deemed appropriate for the proposed development at Quarterlands Road. What are the comparisons in terms of rainfall, topography, water table, soil type for example which makes the importing of the suggested design from Epsom to the proposed site at Drumbeg? The Atkins Reports are silent on why it selected the Woodcoste Storm Drain Design for this site making it impossible for us to provide informed comment on Appendix G. We would request an opportunity to provide comment on a matter which has significant import for our future.
18. Para 4.1.3 in both the Atkins Reports claims that *'proposed discharge rate is limited to greenfield site'*. Currently, the site acts as a soakaway for rain. Even during dry summer months, the site is water logged. We have independent evidence that in June 2023 a political representative who walked across the site found over a foot deep of water when inserting a stick into the ground. The political representative also took rushes from the field as evidence of the water level and habitat within the site. To suggest that the *'proposed discharge rate is limited to greenfield site'* demonstrates the shortcoming associated with failing to undertake a site visit. The Reports fail to address the fact that the proposed site is some two metres above lower lying dwellings at Rural Cottages the potential for flooding of these properties or sewage seepage is not considered as the Reports myopically consider the site without reviewing adjoining lands.
19. We consider that the Atkins Reports are so inadequate as to require a fuller drainage assessment to be undertaken to ensure that surrounding properties are not compromised by this proposed development. Furthermore, there are two errors in Appendix B, Northern Ireland Flood Maps: (1) 58 Quarterlands Road has been incorrectly included within the planning application. (2) Appendix D the proposed site layout has not been updated in the

August 2023 Atkins Report. 'The grey shading indicates optional single storey returns', which are now part of the ground floor plans for all dwellings excluding the three affordable dwellings.

In conclusion, we have significant concerns about the Drainage Assessment set out in the Atkins Reports as detailed above. The Atkins Reports lack, in our opinion, the detail and thoroughness of a comparator Report completed by Flood Risk Consulting (see Para 3 and 4 above). We also are concerned that the initial Atkins Report was prepared at an earlier stage in the developer's plans for the site and provided no site-specific data and did not benefit from a site visit. The extent to which the conclusions of the Atkins Reports remain robust given the minimal updating provided in the August 2023 Atkins Report remains questionable. This view is reinforced by the absence of site-specific data within either report, or the provision of information on the limitations of methodologies used to inform Appendix F given site size and the existing pipe infrastructure. We have provided information on the soakaway function served by the proposed site, it being waterlogged even during summer months and the extent of surface water runoff and flooding in the area immediately outside the site. We are concerned at the prospect of flooding from the site into homes, particularly at Rural Cottages, given these dwellings lie some two metres lower than the proposed site. It is our considered opinion that an update Drainage Assessment Report is required given our concerns about the use of a desk-top methodology and the modelling techniques used to inform the Atkins Reports.

Furthermore, the basis upon which NI Water determined a headroom for 17 connections, given that since at least 2019 it has stated that Drumbeg WwTw is at capacity, is currently being pursued directly with NI Water. We consider that NI Water's decision making in relation to this proposed development is flawed. This is a matter about which we are seeking legal advice. We consider that pending further consultation with our legal representative that this application should not be presented to the Planning Committee for determination.

Yours sincerely,

Q



### **Policy FLD 3**

#### **Development and Surface Water (Pluvial) Flood Risk Outside Flood Plains**

A Drainage Assessment will be required for all development proposals that exceed any of the following thresholds:

- A residential development comprising of 10 or more dwelling units
- A development site in excess of 1 hectare
- A change of use involving new buildings and / or hardsurfacing exceeding 1000 square metres in area.

A Drainage Assessment will also be required for any development proposal, except for minor development<sup>11</sup>, where:

- The proposed development is located in an area where there is evidence of a history of surface water flooding.
- Surface water run-off from the development may adversely impact upon other development or features of importance to nature conservation, archaeology or the built heritage.

Such development will be permitted where it is demonstrated through the Drainage Assessment that adequate measures will be put in place so as to effectively mitigate the flood risk to the proposed development and from the development elsewhere.

Where a Drainage Assessment is not required but there is potential for surface water flooding as indicated by the surface water layer of the Strategic Flood Map, it is the developer's responsibility to assess the flood risk and drainage impact and to mitigate the risk to the development and any impacts beyond the site.

Where the proposed development is also located within a fluvial or coastal flood, then Policy FLD1 takes precedence.

(Department of the Environment's Planning and Flood Risk Policy (Revised Planning Policy Statement 15, September 2014)