

#### **4.14 MODELLING DISPERSION FROM DISCRETE AND AGGREGATED GRID SOURCES**

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Atmospheric dispersion modelling is an integral part of any air quality review and assessment. Better understanding of atmospheric physics has led to the development of advanced dispersion models. These sophisticated models are capable of producing a more accurate pollutant concentration prediction. However, they generally require high computational resources and may take several weeks to produce a 10-metre resolution pollution map. One way to reduce computational time in air quality assessments is by modelling emissions above a preset threshold discretely, while emissions below this threshold are aggregated and modelled as grid sources. The aim of this work is to investigate the advantages and disadvantages of using this method in predicting pollutant concentrations. This paper describes the methodology and preliminary results from this work.

The investigation was divided into three phases. The first phase compared pollutant concentrations from point and lines sources modelled discretely with those aggregated as grid sources. The second phase compared the time required to model each type of source (point, line and grid). Finally, the third phase consisted of sensitivity studies used to determine the threshold level, above which point and line sources should be modelled discretely. The preliminary results from this work showed that this method have to be used with care. Pollution maps with non-smooth edges over grid sources with high emissions may be produced if the method is incorrectly applied. The results from this investigation can aid dispersion modellers to increase the efficiency of air quality assessments, without compromising the quality of pollutant prediction.