# Appendix H - Flood Hazard Information

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# H Flood Hazard Information

The generation of appropriate flood hazard data was a part of the Pontardawe study. In addition to recording both depth and velocity maps, TUFLOW was also configured to record the flood hazard directly. Peak hazard grids in GIS format have been supplied with the digital deliverables that accompany this report and this Appendix summarises the way in which hazard was recorded for these outputs.

The peak flood hazard maps were configured to record the U.K. Hazard Rating as proposed in the flood risks to people guidance (FD23211). This uses the formula: D*(V+0.5)+DF, where D = depth, V = velocity and DF = debris factor. This formula is assessed at each time step of the model since peak hazard may not necessarily be synchronous with peak depth and/or velocity.

The debris factor can be set in a number of ways but the most recent guidance[2] is to use a depth varying debris factor with a non-zero value at low flood depths. These debris factors are given in table below.

**Conservative Debris Factors**

| Depths | Debris Factor (Conservative Approach) |
|---|---|
| 0 to 0.25 m | 0.5 |
| 0.25 to 0.75 m | 1 |
| d>0.75 m and/or v>2 | 1 |

TUFLOW is able to record UK Flood Hazard in two different formats. The TUFLOW ZUK0 option saves the hazard value as the direct outcome of the formula D*(V+0.5)+DF for each active cell. The ZUK1 option records the hazard as an integer value corresponding to the flood hazard category (given in the Flood Hazard Rating table below) according to DEFRA guidance FD2321. The ZUK1 option can be very useful for producing simple colour coded maps of hazard category but since the May 2008 technical note recommended altering the bounds of the hazard categories (see Table below), the ZUK1 option has not been used for the current study. Instead the ZUK0 option with a conservative debris factor was used.

**Flood Hazard Rating**

| TUFLOW ZUK1 categories[1] | | Current Guidance[2] | |
|---|---|---|---|
| Flood Hazard Rating | Hazard to people | Flood Hazard Rating | Hazard to people |
| 0 | No Hazard | 0 | No Hazard |
| < 0.75 | Low Hazard | <0.75 | Very Low Hazard |
| 0.75 - 1.25 | Moderate Hazard | 0.75 - 1.25 | Danger for some |
| 1.25 - 2.5 | Significant Hazard | 1.25-2.0 | Danger for most |
| > 2.5 | Extreme Hazard | > 2.0 | Danger for all |

Notes; [1] based on FD2321 Guidance, [2] based on May 2008 Technical Note

[1] Defra and Agency (2006) *The Flood Risks to People Methodology*, Flood Risks to People Phase 2, FD2321 Technical Report 1, HR Wallingford et al. did the report for Defra/EA Flood and Coastal Defence R&D Programme, March 2006. (http://sciencesearch.defra.gov.uk/Document.aspx?Document=FD2321_3436_TRP.pdf)

[2] SUPPLEMENTARY NOTE ON FLOOD HAZARD RATINGS AND THRESHOLDS FOR DEVELOPMENT PLANNING AND CONTROL PURPOSE – Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1. (http://randd.defra.gov.uk/Document.aspx?Document=FD2321_7400_PR.pdf)