



Issues with flooding at Brownfield sites Mobilisation of contaminants in floodwater

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- Specific problem of contaminant mobilisation and transport
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Issues with Flooding





Issues with Brownfield Sites



Issues with Flooding at Brownfield sites

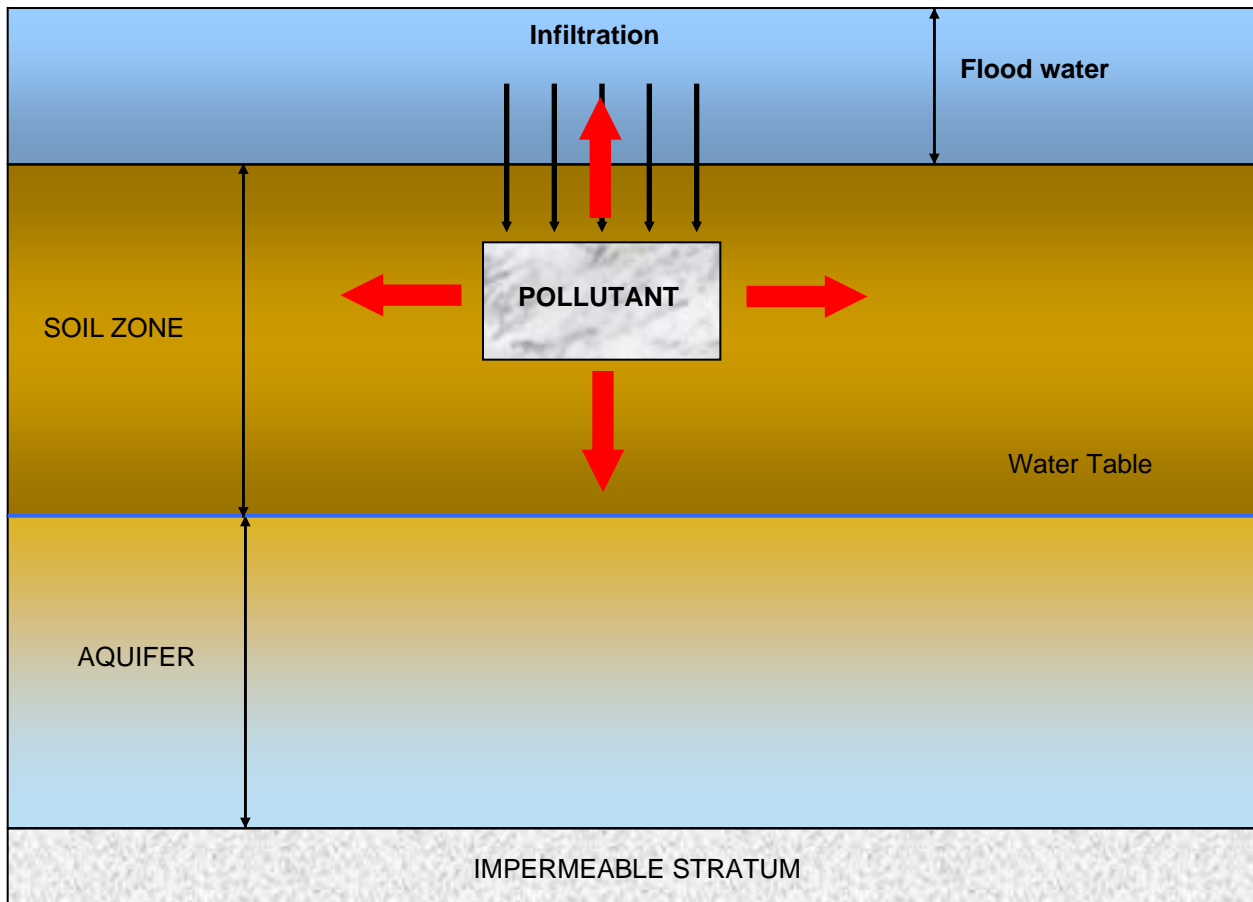
- Brownfield sites are often located in areas at risk from flooding (fluvial, tidal, pluvial, groundwater...etc)
- Brownfield sites are often located in urban areas close to sensitive receptors.
- While Brownfield sites lie vacant the full extent of contamination problems remain unknown.

Because of the above...

- **There is a risk that contaminants at Brownfield sites can be mobilised and transported within floodwater.**



Contaminant Mobilisation



Main Factors Influencing Contaminant Mobilisation

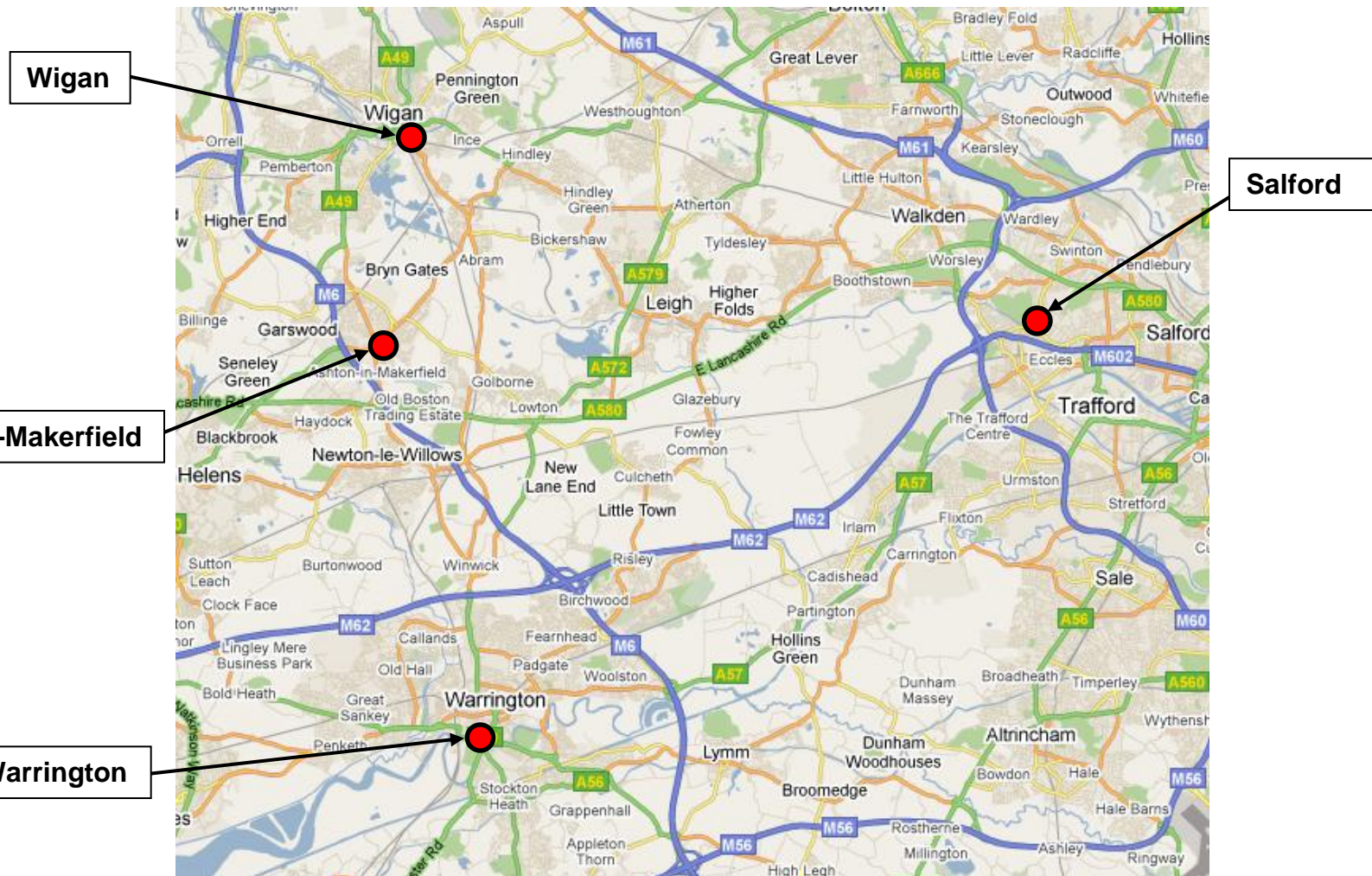
- Depth of floodwater and length of time flood is above the ground surface
- Type of contaminant – some contaminants are more readily mobilised and transported
- Concentration of contaminant
- Porosity of soil
- Accessibility of contaminant

Methods for assessing contaminant mobilisation

- There are a number of different methods for assessing contaminant mobilisation and transportation, but there is no one size fits all approach.
- Simplified spreadsheet based methods
- EA Remedial Targets Methodology (R&D Publication 20)
- ConSim – more complex analysis based on P20 methodology
- Other hydraulic modelling softwares e.g. ISIS, InfoWorks, TUFLOW-AD – deal with contaminant transport within floodwater



Flood Risk Assessment Case Studies



Case Study 1 - Wigan

- Site covered an area of approx 5 hectares – proposed new residential development
- Site was located in Flood Zone 3, therefore a flood risk assessment was required in accordance with PPS25
- Hydraulic modelling – ISIS 1-dimensional model (1:100 year + climate change flood event)
- Hydrology – FEH, ReFH, IH124
- Greenfield Runoff Assessment – to limit post development runoff to pre-development rates
- Conclusions - Mitigation measures required:-
 - Site raised above 1:100 + climate change flood
 - Compensatory floodplain storage
 - SUDS

Case Study 2 – Warrington

- Site covering an area of approx 13 hectares – proposed for new commercial /industrial development
- Site was located in Flood Zone 3, therefore a flood risk assessment was required in accordance with PPS25
- Existing EA model available - 1:100 year + climate change flood levels were already available
- Greenfield Runoff – to limit post development runoff to pre-development rates – IH124 methodology used
- Conclusion – Mitigation measures required:-
 - Site raised above 1:100 + climate change flood
 - Compensatory flood storage required - **Significant volume required**
 - SUDS

Practical Applications

- Appropriate assessment of the potential for contaminant mobilisation and transportation on sites at risk from flooding.
- Selection of appropriate remediation techniques on Brownfield sites at risk from flooding.
- Design of SUDS for Brownfield sites at risk from flooding.
- Climate change - Due to predicted sea level rises and global climatic changes, there exists an increased potential for contaminants to be mobilised and transported within the ground and surface environments.



Items covered

- Issues with flooding at Brownfield sites
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- Methods for assessing contaminant mobilisation and transport
- Case studies
- Practical applications



Thank you for listening

Any Questions?



Methods for assessing contaminant mobilisation

Figure 3.5 Assessment Framework for Transfer of Pollutants Worksheet v1.1

