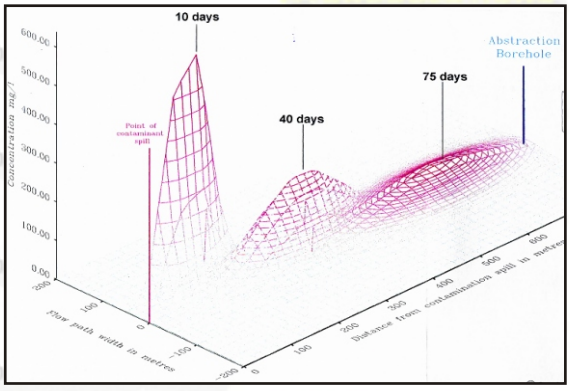
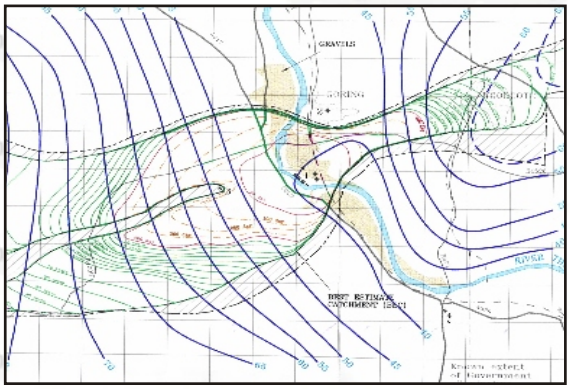
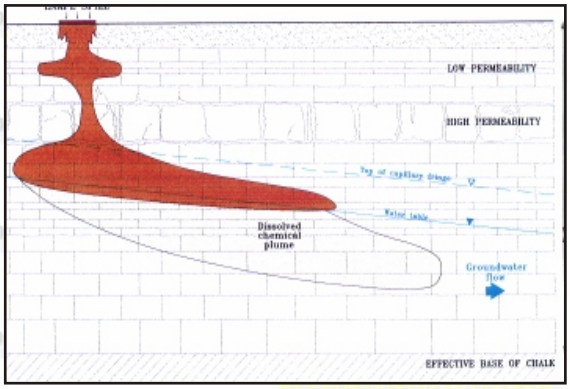
Risk 5





No. of events	1 year		10 years		20 years		50 years		100 years	
	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound
=0	0.999	0.971	0.99	0.748	0.981	0.56	0.952	0.235	0.907	0.055
>=1	0.001	0.029	0.01	0.252	0.019	0.44	0.048	0.765	0.093	0.945
>=2	0	0	0	0.035	0	0.115	0.001	0.425	0.004	0.785
>=3	0	0	0	0.003	0	0.021	0	0.179	0	0.554
>=4	0	0	0	0	0	0.003	0	0.06	0	0.33
>=5	0	0	0	0	0	0	0	0.016	0	0.168



QUANTITATIVE RISK ASSESSMENT: GROUNDWATER QUALITY AT THE GATEHAMPTON PUBLIC WATER SUPPLY

A fully Quantitative Risk Assessment (QRA) was undertaken to assess the risk from the movement and storage of hazardous chemicals adjacent to the UK's largest groundwater PWS (70Ml/day).

A derogation event was defined as the risk of raw water quality exceeding the Drinking Water guidelines. The groundwater catchment area was modelled numerically using FLOWPATH. Isochrones (time of travel) were identified, and the following risks examined:
-Movement/spillage of hazchems by road/rail/or river barge
-Storage/leakage of hazchems used within the catchment
-Risk of flood inundation to the borefield.

Key potential contaminants were identified based on their most common form & relative toxicity. For each scenario, the probability & likely volume of loss was determined from historical transport & flood statistics. The significance of impact on groundwater quality was determined iteratively by back-calculating the volume of substance required to cause a derogation at the borefield for a given time/distance. The probability was determined from the number of spill events per year per unit length of road/rail/river.

Conclusions:

-Lower bound estimate: Derogation risk less likely within a 100 year operating period
-Upper bound estimate: Derogation risk more likely above a 24-year operating period
-Mots likely derogation frequency was estimated at 0.03055, or the 1 in 33 year event, in excess of a proposed benchmark acceptability
-Return period estimated at 124 years
The 1 in 5 year flood event also exceeds a proposed benchmark acceptability.

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