
INFORMATION SOURCES

SECTION 3 – SOFTWARE MODELS

This section provides a list of some of the risk assessment software models available. The models are described and a source contact given. The models are divided into risk assessment/management models (category 1), exposure assessment/transport/fate models (category 2), and hazard identification/release assessment models (category 3). It is recognised that the list cannot, in any way, be considered comprehensive. There are probably well over 500 such models in existence world-wide. The models presented here are examples.

Sources of information include personal contact with vendors/developers, literature searches and work carried out by UK Environment Agency (HMIP), DNV Technica, and Imperial College London (Link Research Project – Pollution Risk Assessment Techniques for Non-Routine Releases from Industrial Processes, 1995).

Category 1 – Risk assessment/management

Model/Tool:	@RISK
Description:	Quantitative risk analysis software.
Source:	Palisade Corporation, 31 Decker Road, Newfield, NY 14867, USA. Tel: (+1 607) 277 8000
Model/Tool:	3DTIM
Description:	Tool for evaluating the effect of different releases.
Source:	VTT, Manufacturing Technology, PO Box 1700, FIN-02044 VTT, Finland. Tel: (+358 0) 4561
Model/Tool:	ADLTRS
Description:	Transport risk assessment tool for chemicals. Assess risks to humans and the environment.
Source:	Arthur D. Little Ltd, Berkeley Square House, Berkeley Square, London W1X 6EY, UK. Tel: (+44 171) 409 2277
Model/Tool:	APPRAISE
Description:	Database and calculation tool to assess the environmental impact of industrial releases.
Source:	WRc and Intere - WRc, Henley Road, Medmenham, Marlow, Bucks. SL7 2HD, UK. Tel: (+44 1491) 571 531
Model/Tool:	BioSVE
Description:	Contaminated land remediation model.
Source:	Available from Scientific Software Group - PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool:	CDEU
Description:	Quantitative method to calculate consequence of industrial emissions.
Source:	DNV Technica, Palace House, 3 Cathedral Street, London SE1 9DE, UK. Tel: (+44 171) 3576080
Model/Tool:	CONDOR
Description:	Probabilistic risk assessment - consequence of accidental radioactive release.
Source:	AEA, NRPB - AEA Technology, 329 Harwell, Didcot, Oxfordshire OX11 0RA, UK. Tel: (+44 1235) 821111
Model/Tool:	DOE#1
Description:	Risk assessment and risk management methodology.
Source:	DOE
Model/Tool:	DRANC
Description:	Risk assessment for new chemicals (human, ecological).
Source:	RIVM, Postbox 1, NL-3720 BA Bilthoven, Netherlands, Tel: (+31 30) 274 9111
Model/Tool:	DSS
Description:	Exposure and Risk Assessment Decision Support System - estimates human exposure and risk from sites contaminated with petroleum products.
Source:	American Petroleum Institute, 1220 L Street, Northwest, Washington DC 20005-4070, USA. Tel: (+1 202) 682 8000
Model/Tool:	EAPPEARP
Description:	Methodology using environmental indices to rank risk potential.
Source:	Debeil-Myren
Model/Tool:	EIL#1
Description:	Risk rating system utilising fault tree analysis.
Source:	RPS

Model/Tool:	Enviro V
Description:	Hazard identification and risk assessment.
Source:	Enviro
Model/Tool:	EPIcode
Description:	Risk assessment of concentrations resulting from atmospheric release.
Source:	Homann
Model/Tool:	ETX
Description:	Risk assessment - calculation of percentage of unprotected species at a given exposure.
Source:	RIVM, Postbox 1, NL-3720 BA Bilthoven, Netherlands, Tel: (+31 30) 274 9111
Model/Tool:	HAZARD
Description:	Ecological risk assessment - probability of a species affected at a given PEC.
Source:	TNO, Laan van Westenenk 501, PO Box 342, 7300 AH Apeldoorn, Netherlands. Tel: (+31 15) 269 6969
Model/Tool:	HAZTRAC
Description:	Hazard management software using HAZOP results.
Source:	DNV Technica, Palace House, 3 Cathedral Street, London SE1 9DE, UK. Tel: (+44 171) 357 6080
Model/Tool:	HazTrans
Description:	Multi-modal hazardous materials management tool - transport risk.
Source:	Abkowitz and Associates Inc.
Model/Tool:	IIASA
Description:	Impact, ecological and technological risk assessment and hazardous substance management.
Source:	IIASA
Model/Tool:	MASCOT
Description:	Calculates radiological risks from groundwater pathways.
Source:	Nirex, Allerdale Court, Greengarth Hall, Holmrook, Cumbria CA19 1UL, UK. Tel: (+44 1235) 825 518
Model/Tool:	OHRA
Description:	Offshore hazard and risk analysis.
Source:	DNV Technica, Palace House, 3 Cathedral Street, London SE1 9DE, UK. Tel: (+44 171) 357 6080
Model/Tool:	OLF#1
Description:	Environmental risk caused by acute spills - acceptance criteria.
Source:	OLF
Model/Tool:	RBCA
Description:	Risk Based Corrective Action Tool Kit for contaminated land and water.
Source:	Groundwater Services Inc. (Geraghty and Miller International Inc. - distributors)
Model/Tool:	REFEREE
Description:	Ecological risk assessment using effect models linked to ecological and ecotoxicological databases.
Source:	TNO, Laan van Westenenk 501, PO Box 342, 7300 AH Apeldoorn, Netherlands. Tel: (+31 15) 269 6969
Model/Tool:	RISKAT
Description:	Tool to quantify risks to people living in the vicinity of major hazard sites.
Source:	UK HSE, Baynards House, 1 Chepstow House, Westbourne Grove, London W2 4TF, UK. Tel: (+44 171) 243 6000

Model/Tool:	Riskplot II
Description:	Risk assessment software for human and environmental risks from acute releases of hazards at industrial installations.
Source:	Four Elements Ltd, 8 Cavendish Square, London W1M 0ER, UK. Tel: (+44 171) 465 7200
Model/Tool:	RISKPRO
Description:	Software which predicts the impacts of environmental releases.
Source:	GSC
Model/Tool:	RISKWIT
Description:	Risk assessment software for accidental release of toxic, flammable or explosive material.
Source:	VTT, Manufacturing Technology, PO Box 1700, FIN-02044 VTT, Finland. Tel: (+358 0) 4561
Model/Tool:	RIVPACS
Description:	Water quality prediction and classification scheme.
Source:	UK Environment Agency, Rivers House, Waterside Drive, Aztec West, Almondsbury, Bristol BS12 4UD. Tel: (+44 1454) 624400
Model/Tool:	SAFETI
Description:	Risk assessment, discharge, consequence and risk modelling.
Source:	DNV Technica, Palace House, 3 Cathedral Street, London SE1 9DE, UK. Tel: (+44 171) 3576080
Model/Tool:	SARAH
Description:	Risk assessment, accidental release of hazardous material into the atmosphere.
Source:	AEA Technology, 329 Harwell, Didcot, Oxfordshire OX11 0RA, UK. Tel: (+44 1235) 821111
Model/Tool:	SENSES1
Description:	Risk assessment model.
Source:	SENSES Consultancy
Model/Tool:	Simplebox
Description:	Dispersion, risk assessment.
Source:	RIVM, Postbox 1, NL-3720 BA Bilthoven, Netherlands. Tel: (+31 30) 274 9111
Model/Tool:	ToxScreen
Description:	Model for assessment of risk of pollution/harm to air, water, and soil.
Source:	US EPA, 960 College Station Road, Athens, Georgia, USA. Tel: (+1 706) 355 8400
Model/Tool:	UST
Description:	Risk assessment/management ranking system for underground storage tanks.
Source:	Casana et al.
Model/Tool:	VERIS II
Description:	Risk assessment and management.
Source:	VROM, PO Box 20951, 2500 The Hague, Netherlands. Tel: (+31 70) 339 3939
Model/Tool:	XENVIS
Description:	Risk assessment/management - accidental air pollution, toxic water spills, etc.
Source:	Phoenix

Category 2 – Exposure assessment/transport/fate

Model/Tool:	AIRFLOW/SVE
Description:	Multi-component soil vapour extraction model.
Source:	Waterloo Hydrogeologic Software (Available through Scientific Software Group - PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214)
Model/Tool:	AQMS
Description:	Air Quality Management System - contaminant dispersion in air.
Source:	Ashdown Environmental, The Oast House, Hodore, Upper Hartfield, East Sussex TN7 4AR, UK. Tel: (+44 1892) 770 881
Model/Tool:	AQUA
Description:	Groundwater flow and contaminant transport model.
Source:	Available through Scientific Software Group - PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool:	ARMOS 5.0
Description:	Software for migration of free phase light hydrocarbon and recovery system design.
Source:	Geraghty and Miller International Inc. Suite A, Conqueror House, Vision Park, Histon, Cambridge, CB4 4ZR, UK. Tel: (+44 1223) 236950. Fax: (+44 1223) 236242
Model/Tool:	AT123D
Description:	Analytical groundwater transport model.
Source:	Available through Scientific Software Group - PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool:	BIOTRANS 1.0
Description:	Modelling of multi-species dissolved transport with oxygen-limited decay in fracture or porous aquifers.
Source:	Geraghty and Miller International Inc. Suite A, Conqueror House, Vision Park, Histon, Cambridge, CB4 4ZR, UK. Tel: (+44 1223) 236950. Fax: (+44 1223) 236242
Model/Tool:	ChemPath
Description:	Contaminant transport model for ground water.
Source:	BASELINE Concept Inc. (Available through Scientific Software Group - PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214)
Model/Tool:	CTRAN/W
Description:	Model for contaminant transport through soil and rock.
Source:	Available through Scientific Software Group - PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool:	DYNTOX
Description:	Surface water model which estimates concentrations of toxic substances.
Source:	US EPA, 960 College Station Road, Athens, Georgia, USA. Tel: (+1 706) 355 8400
Model/Tool:	EXAMS II
Description:	Exposure simulation model looking at effect of a chemical on a ecosystem, concentrations, fate and transport
Source:	US EPA, 960 College Station Road, Athens, Georgia, USA. Tel: (+1 706) 355 8400
Model/Tool:	FARMLAND
Description:	Simulates radionuclide transfer through the food chain (accidental release).
Source:	CERC
Model/Tool:	FLONET/TRANS
Description:	Cross-sectional groundwater flow and contaminant transport model.
Source:	Waterloo Hydrogeologic Software (Available through Scientific Software Group - PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214)

Model/Tool: GMS 2.0
Description: Groundwater flow and contaminant modelling system.
Source: US Department of Defence (Available through Scientific Software Group - PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214)
Model/Tool: Groundwater Vistas
Description: A comprehensive modelling system incorporating many popular flow models such as MODFLOW, MODPATH, PATH3D, MT3D, MODFLOW-SURFACT and others.
Source: Environmental Simulations Ltd, Acorn Villa, Oak Street, Shrewsbury SY3 7RQ, UK. Tel: (+44 1743) 369 504
Model/Tool: ModelCad
Description: Contaminant fate and transport model for ground water.
Source: Geraghty and Miller International Inc. Suite A, Conqueror House, Vision Park, Histon, Cambridge, CB4 4ZR, UK. Tel: (+44 1223) 236950. Fax: (+44 1223) 236242
Model/Tool: MODFLOW
Description: Groundwater flow and contaminant transport model.
Source: USGS. Environmental Simulations Limited, Acorn Villa, Oak Street, Shrewsbury SY3 7RQ, UK. Tel: (+44 1743) 369 504
Model/Tool: MODFLOW-SURFACT
Description: Groundwater flow and contaminant transport model.
Source: HydroGeoLogic Inc. (Available through Scientific Software Group - PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214)
Model/Tool: MOFAT
Description: Multiphase (water, oil, gas) flow and multi-component transport model.
Source: Available from Scientific Software Group, PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool: Motrans 2-D
Description: A model for multi-phase flow and transport of multi-component organic liquids.
Source: Geraghty and Miller International Inc. Suite A, Conqueror House, Vision Park, Histon, Cambridge, CB4 4ZR, UK. Tel: (+44 1223) 236950. Fax: (+44 1223) 236242
Model/Tool: MS-VMS
Description: Groundwater flow and contaminant transport model.
Source: HydroGeoLogic, Inc. (Available through Scientific Software Group - PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214)
Model/Tool: MT3D
Description: Contaminant fate and transport model for ground water.
Source: Geraghty and Miller International Inc. Suite A, Conqueror House, Vision Park, Histon, Cambridge, CB4 4ZR, UK. Tel: (+44 1223) 236950. Fax: (+44 1223) 236242
Model/Tool: MULTIMED
Description: Multimedia exposure assessment model simulating the transport and transformation of contaminants released from a waste disposal facility.
Source: US EPA, 960 College Station Road, Athens, Georgia, USA. Tel: (+1 706) 355 8400
Model/Tool: MUTIMED
Description: Multimedia exposure assessment tool simulates leaching of contaminants from a waste disposal facility. Predicts concentrations at receptor.
Source: US EPA, 960 College Station Road, Athens, Georgia, USA. Tel: (+1 706) 355 8400

Model/Tool:	OILVOL
Description:	Model which estimates the free hydrocarbon volume in a soil and computes the volume of residual oil in the saturated and unsaturated zones.
Source:	Available from Scientific Software Group, PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool:	OTTER
Description:	Mass movements of radionuclides in water.
Source:	AEA Technology, 329 Harwell, Didcot, Oxfordshire OX11 0RA, UK. Tel: (+44 1235) 821111
Model/Tool:	PESTLA
Description:	Dispersion of pesticides in groundwater.
Source:	RIVM, Postbox 1, NL-3720 BA Bilthoven, Netherlands. Tel: (+31 30) 274 9111
Model/Tool:	PLUMES
Description:	Dilution/dispersion model for pollution plumes in marine and fresh water
Source:	US EPA, 960 College Station Road, Athens, Georgia, USA. Tel: (+1 706) 355 8400
Model/Tool:	PRAIRIE
Description:	Dispersion model for pollution into rivers and estuaries.
Source:	AEA Technology, 329 Harwell, Didcot, Oxfordshire OX11 0RA, UK. Tel: (+44 1235) 821111
Model/Tool:	PRINCE
Description:	Integrated transport and flow model package.
Source:	Available from Scientific Software Group, PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool:	PRZM2
Description:	Pesticide Root Zone Model - predicts fate of pesticides in and below the root zone.
Source:	US EPA, 960 College Station Road, Athens, Georgia, USA. Tel: (+1 706) 355 8400
Model/Tool:	SESOL
Description:	Long term pollution fate and transport model
Source:	Available from Scientific Software Group, PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool:	SURPAC 2000
Description:	Integrated environmental modelling software incorporating three groundwater modelling tools - MODFLOW, MT3D and THEISA.
Source:	Surpac Software International (UK) Ltd, Unit 7, The Courtyard, Whitwick Business Park, Coalville, LE67 4JP. Fax: (+44 1530) 839989
Model/Tool:	SMPTOX
Description:	Calculates water column and stream bed toxic substance concentrations resulting from point source discharges into streams and rivers.
Source:	US EPA, 960 College Station Road, Athens, Georgia, USA. Tel: (+1 706) 355 8400
Model/Tool:	TARGET
Description:	Groundwater Contaminant Model
Source:	Dames and Moore, Booth House, 15-17 Church Street, Twickenham TW1 3NJ, UK. Tel: (+44 181) 891 6161
Model/Tool:	TWODAN
Description:	2-D analytical fate and transport model.
Source:	Available from Scientific Software Group, PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214

Model/Tool: WASP
Description: Water Quality Analysis Simulation Programme models contaminant fate and transport in surface waters
Source: US EPA, 960 College Station Road, Athens, Georgia, USA. Tel: (+1 706) 355 8400
Model/Tool: VAM2D
Description: 2-D finite element model that simulates water flow and contaminant transport.
Source: Available from Scientific Software Group, PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool: Visual MODFLOW
Description: 3-D groundwater flow and contaminant transport model.
Source: Available from Scientific Software Group, PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool: Win TRAN
Description: Groundwater contaminant model.
Source: Available from Scientific Software Group, PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool: WINFLOW
Description: Contaminant fate and transport model for ground water.
Source: Environmental Simulations Limited, Acorn Villa, Oak Street, Shrewsbury SY3 7RQ, UK. Tel: (+44 1743) 369 504
Model/Tool: WINTRAN
Description: Contaminant fate and transport model for ground water.
Source: Environmental Simulations Limited, Acorn Villa, Oak Street, Shrewsbury SY3 7RQ, UK. Tel: (+44 1743) 369 504

Category 3 – Hazard identification/release assessment

Model/Tool:	Breeze Air Models
Description:	Gas Dispersion Models.
Source:	Trinity Consultants Inc., 12801 North Central Expressway, Suite 1200, Dallas, Texas 75243, USA. Tel: (+1 214) 661 8100
Model/Tool:	CARA
Description:	Hazard identification, frequency and consequence estimation.
Source:	DNV Technica, Palace House, 3 Cathedral Street, London SE1 9DE, UK. Tel: (+44 171) 357 6080
Model/Tool:	DEGADIS
Description:	Dense Gas Dispersion Model.
Source:	Trinity Consultants Inc., 12801 North Central Expressway, Suite 1200, Dallas, Texas 75243, USA. Tel: (+1 214) 661 8100
Model/Tool:	DENZ
Description:	Calculation of dispersion of dense gas from an instantaneous failure.
Source:	AEA Technology, 329 Harwell, Didcot, Oxfordshire OX11 0RA, UK. Tel: (+44 1235) 821111
Model/Tool:	DRIFT
Description:	Calculation of dispersion of dense gas from instantaneous failure and at steady rate.
Source:	AEA Technology, 329 Harwell, Didcot, Oxfordshire OX11 0RA, UK. Tel: (+44 1235) 821111
Model/Tool:	EXPEL 1
Description:	Models confined and unconfined vapour cloud explosions.
Source:	AEA Technology, 329 Harwell, Didcot, Oxfordshire OX11 0RA, UK. Tel: (+44 1235) 821111
Model/Tool:	Fault Tree Man
Description:	Fault tree modelling tool.
Source:	AEA Technology, 329 Harwell, Didcot, Oxfordshire OX11 0RA, UK. Tel: (+44 1235) 821111
Model/Tool:	FaultREASE
Description:	Fault tree software package.
Source:	Arthur D. Little Ltd, Berkeley Square House, Berkeley Square, London W1X 6EY, UK. Tel: (+44 171) 409 2277
Model/Tool:	GASP
Description:	Calculates the evaporation of a spreading pool of liquid.
Source:	AEA Technology, 329 Harwell, Didcot, Oxfordshire OX11 0RA, UK. Tel: (+44 1235) 821 111
Model/Tool:	Hazard Man
Description:	Tool to carry out HAZOP, What-if and FMEA studies and access to rank hazards.
Source:	AEA Technology, 329 Harwell, Didcot, Oxfordshire OX11 0RA, UK. Tel: (+44 1235) 821111
Model/Tool:	HAZOptimizer
Description:	Hazard identification package able to perform HAZOP, FMEA, What-if.
Source:	Arthur D. Little Ltd, Berkeley Square House, Berkeley Square, London W1X 6EY, UK. Tel: (+44 171) 409 2277
Model/Tool:	HAZSEC
Description:	Software package for process hazard identification (HAZOP, FMEA).
Source:	DNV Technica, Palace House, 3 Cathedral Street, London SE1 9DE, UK. Tel: (+44 171) 357 6080
Model/Tool:	HOT SPILLS
Description:	Dispersion model of products from a burning chemical spill.
Source:	Trinity Consultants Inc., 12801 North Central Expressway, Suite 1200, Dallas, Texas 75243, USA. Tel: (+1 214) 661 8100

Model/Tool: INPUFF
Description: Acute and chronic gas dispersion model.
Source: Trinity Consultants Inc., 12801 North Central Expressway, Suite 1200, Dallas, Texas 75243, USA. Tel: (+1 214) 661 8100
Model/Tool: ISC View
Description: Air dispersion modelling software.
Source: Available from Scientific Software Group, PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool: Kyspill
Description: Contaminant plume fate and transport model.
Source: Available from Scientific Software Group, PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool: LOGAN
Description: Fault tree analysis software.
Source: RMC
Model/Tool: OPRA
Description: Ranking system to assess hazard by considering site and management.
Source: K Environment Agency (HMIP), Rivers House, Waterside Drive, Aztec West, Almondsbury, Bristol BS12 4UD, UK. Tel: (+44 1454) 624400
Model/Tool: SAFER
Description: Hazard identification, evolution of dispersion cloud from emergency releases.
Source: Du Pont
Model/Tool: SAW
Description: Spill Analysis Work - model for simulation of oil spills and spills of dangerous chemicals into the aquatic environment.
Source: Danish Hydraulic Institute, Agern Alle 5, DK-2970, Norsholm, Denmark. Tel: (+45) 45 76 95 55
Model/Tool: Screen View
Description: Model to analyse worst case scenarios for air pollutants.
Source: Available from Scientific Software Group, PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool: SLAB View
Description: Toxic gas accidental release model.
Source: Available from Scientific Software Group, PO Box 23041, Washington DC 20026-3041, USA. Tel: (+1 703) 620 9214
Model/Tool: SPILLCAD 3.2
Description: A screening model for hydrocarbon spill assessment and remedial design.
Source: Geraghty and Miller International Inc. Suite A, Conqueror House, Vision Park, Histon, Cambridge, CB4 4ZR, UK. Tel: (+44 1223) 236950. Fax: (+44 1223) 236242
Model/Tool: SPILLS
Description: Chemical spill dispersion model for continuous spills, acute pools of liquid or gas, acute and chronic stack emissions.
Source: Trinity Consultants Inc., 12801 North Central Expressway, Suite 1200, Dallas, Texas 75243, USA. Tel: (+1 214) 661 8100
Model/Tool: TECJET
Description: Dispersion model to simulate jets e.g. from pipes, flange leaks, etc.
Source: DNV Technica, Palace House, 3 Cathedral Street, London SE1 9DE, UK. Tel: (+44 171) 357 6080
Model/Tool: TRAUMA
Description: Calculates the behaviour of a jet release of a flashing, pressured liquid.
Source: AEA Technology, 329 Harwell, Didcot, Oxfordshire OX11 0RA, UK. Tel: (+44 1235) 821111

Model/Tool: TRPUF

Description: Acute release gas dispersion model.

Source: Trinity Consultants Inc., 12801 North Central Expressway, Suite 1200, Dallas, Texas 75243, USA. Tel: (+1 214) 661 8100

Category 4 – Directories of software products

Model/Tool:	CD-ROM of Groundwater Modelling
Description:	Directory of available, public domain groundwater modelling, geochemical, graphical and related software.
Source:	Environmental Simulations Incorporated
Model/Tool:	Model Expert96
Description:	Directory of available groundwater models - Windows-based.
Source:	Available from Scientific Software Group