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THE ENVIRONMENT AGENCY'S RISK PORTFOLIO ANNEX 1, REGISTER OF RISK ASSESSMENT TOOLS

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ANNEX 1: Register of Risk Assessment Tools

Purpose

The Register of Risk Assessment Tools provides a detailed listing and description of tools (i.e. models, procedures,) used or under development within the Environment Agency for risk assessment purposes. The register was initially developed based on interviews with personnel from each of the Agency's functions and more recently updated by telephone or fax. The register does not aim to cover all tools available, but rather to summarise those tools most frequently used. To help keep updated this register, please advise the authors of this report of any tools currently not included this Annex. The register is intended to inform the Agency as a whole, and the Directors of Environmental Strategy and Environmental Protection in particular, on the current capabilities of the Agency in risk assessment.

The tools are each described using standard proformas which specify the characteristics of the tools using key phrases. The proforma is explained below.

The order of the proformas is currently grouped according to the section of the Environment Agency from which the tool originated, e.g. Water Resources. However, many of these tools are used by different functions of the Agency. A form reference is used to distinguish each tool, using a code structure of the initials of the Agency section plus a 3-digit number, e.g. WR012. The form references are thus as follows:

SR	Environmental Strategy
OTH	Other tools not specific to any of the above
PIR	Process Industries Regulation
RAS	Radioactive Substances Regulation
LQ	Land Quality
WQ	Water Quality
WP	Waste Management and Regulation
FD	Flood Defence
CO	Fisheries and Conservation
RN	Recreation and Navigation
WR	Water Resources

Table 1 of this Annex provides a brief explanation of the categories used to define the principal characteristics of those risk assessment-related tools used within the constituent parts of the Environment Agency. It is important to note that in many cases, risk assessment is an implicit rather than explicit use of the models and procedures recorded on the proformas. Table 2 lists all the tools included in this Annex and provides a brief description of the purpose of the technique, model or procedure. This is followed by individual proformas for all the tools presented in Table 2.

Table 1: Proforma

Proforma Section Number	Contents	Title
1.	Title	The title by which the technique, model or procedure is most commonly known
	Acronym	The acronym by which the technique, model or procedure is most commonly known
2.	Purpose	A brief description of the primary areas in which the tool is intended to be used.
3.	Additional information	
	Users	This records who the end users of the model are.
	Frequency	This section provides information on how often the model is used – i.e. whether the model is used routinely, periodically (e.g. every few weeks) or as a specialist tool (e.g. used occasionally by experts)
	Development	This identifies the state of development of the model: there may be no plans to revise/update the model (none); the Agency may currently be discussing whether revisions to the model are necessary (arguing revision); or the model may currently be undergoing revision (being revised).
	License conditions	This identifies the license conditions of the model: whether the model has been developed commercially and requires license (licensed product) or whether it is freely available; if the tool is a licensed product, how many license holders does the Agency hold?
4.	General Assessment	This section provides an initial categorisation to identify those areas of the Environment Agency's remit to which the model or procedure may be applicable.
	Media	The media to which the model/procedure is, or may be, applied. Where it may be applied to waste in addition to one of the three primary media, this is also identified.
	Function	The core functions of the Environment Agency to which the model/procedure may be applicable. This may reflect its current use or an area of potential use which would not require significant development work.
	Purpose	The modus operandi of the Environment Agency, within the functions identified above in which the model/procedure is most commonly used. Regulation includes the determination of authorisations, consents and licences. Operational includes routine environmental management as well as enforcement issues. Planning relates primarily to the planning of the Environment Agency's activities. Prioritising relates primarily to identifying those issues which pose greatest risk to the environment.
	Risk Assessment	This section identifies the risk assessment basis of the model/procedure. The model/procedure will be qualitative, semi-quantitative or fully quantitative. It will contribute to the setting of the criteria by which the severity of risks can be determined or it will be involved in the severity assessment itself. For those models recorded, the basis may be probabilistic or deterministic, and some may feature a stochastic simulation capability (e.g. monte-carlo simulation). Finally, the tool will be used for either risk assessment or determining risk management option.
5.	Further Assessment	This section provides a further categorisation of the model/procedure and in particular, focuses on the specific features provided.
	Coverage	This records whether the model/procedure is used on a site-specific basis, whether it can address issues across a catchment or region in one operation, or whether it can assess risks across England and Wales in one operation.
	Type	This section records the form the model/procedure takes. It will be either procedural or mathematical/statistical, and it may cover a range of potential risks/effects from physical issues such as flood water to chemical and radiochemical pollutants.
	System Base	This sets out the form the model/procedure is made available to the user. It also identifies whether the model/procedure has been developed in-house or with third party support.
	Timescale	This sets out over what timescale those models recorded can be applied. If developed by/with third party support, please specify.
	Resolution	This covers the spatial resolution of the model
5.	Cross-Reference	
	Regulatory processes	This identifies how the model relates to the regulatory process
	Standards	This identifies the standards and targets against which the model/procedure assesses the severity of the risk being determined.
	Databases	This identifies the databases required for the model/procedure to operate effectively.
6.	Comments	
	Contact	Provides a principal point of contact for further information on the use or further development of the model/procedure. Many of the contacts noted have developed a particular expertise and level of experience in the use of the model/procedure.

ANNEX 1

Environment Agency
Register of Risk Assessment Tools: Summary Table

TITLE	FORM REF.	ACRONYM	MODEL PURPOSE
Environmental Impact Assessment	SR 001	EIA	Technical guidance on scoping and a comparison volume on further prescriptive guidance to primarily assist external developers on how to assess the environmental impact of projects and schemes, how to reduce risks to the environment from such schemes, and how best to develop mitigating measures.
Strategic Risk Assessment Methodology	SR 002	SRAM	This methodology has been developed to enable comparative assessments of environmental impacts at the strategic level.
R&D Prioritisation spreadsheet	OTH 001		To provide a standard, consistent method for collating and prioritising R&D proposals based on the Agency.
European Union system for the Evaluation of Substances, version 1.0.	OTH 002	EUSES	

TITLE	FORM REF.	ACRONYM	MODEL PURPOSE
Hull Acid Rain Model	PIR 001	HARM	This model is used for the calculation of the concentration and deposition of sulphur and nitrogen pollutants over the UK and creating deposition maps.
Meso and Regional Scale Pollutant dispersion and Deposition Model	PIR 002	NAME II	To calculate and forecast pollutant concentration and deposition. It is used for retrospective episodes of analysis of poor air quality.
United Kingdom Air Dispersion Modelling System	PIR 003	UKADMS	Calculation of short-term - long-term ground level pollutant concentrations for released to air (air dispersions model).
	PIR 004	AERM	
	PIR 005	SURSER	
	PIR 006	DISTAR	
Operator and Pollution Risk Appraisal	PIR 007	OPRA	OPRA assess several aspects of the performance of an operator to provide an indication of probability of an occurrence of an undesirable event and the consequences of the event. These factors are combined to give an indication of comparative risks.
Uniform System for the Evaluation of Substances	PIR 008	USES	USES is a tool that can be used for rapid quantitative assessments of the general risks of substances. USES may be applied to risk assessment and to set priorities for new and existing substances.

TITLE	FORM REF.	ACRONYM	MODEL PURPOSE
Validity Analysis of Disposal Alternatives	RAS 001	VANDAL	VANDAL is central to the Agency's quantitative risk assessment capability, providing estimates of risk to man, over long time scales, from radionuclide releases from radioactive waste disposal facilities.
WOLFNET	RAS 002	WOLFNET	WOLFNET is the flow sub-model in VANDAL and provides groundwater flow predictions for the transport sub-model in VANDAL.
DECOS-MG	RAS 003	DECOS-MG	Dynamic modelling of radionuclide migration within the surface environment.
TIME4	RAS 004	TIME4	This methodology is being developed to enable risk assessments for other techniques to be normalised in order to establish priorities across the remit of the Environment Agency.
Chemical Transport Adsorption Redox and Delay Model	RAS 005	CHEMTARD	CHEMTARD is a coupled chemical transport code used to determine the migration of radionuclides through the geosphere.
pH Redox Equilibrium Equations	RAS 006	PHREEQE	The PHREEQE computer program is designed to modelling geochemical reactions. Based on an ion pairing model, PHREEQE can calculate pH, redox potential, and mass transfer as a function of reaction progress.

TITLE	FORM REF.	ACRONYM	MODEL PURPOSE
Part IIA EPA 1990. Handbook, Guidance Notes and Supporting Manuals.	LQ 001		To describe the process to be adopted by the Agency when exercising regulatory control under the contaminated land provisions of Part IIA of the Environmental Protection Act 1990. The Handbook also provides links to associated Agency documentation (i.e. guidance notes and supporting manuals).
Model Procedures for the Management of Contaminated Land.	LQ 002		To provide a structured framework and procedural guidance for the identification, treatment and monitoring of contaminated land.
Contaminated Land Exposure Assessment	LQ 003	CLEA	Estimating likely human exposure for contaminants in soils for the development of guideline values to indicate whether there are any unacceptable long-term risks to human health.
Short Term Risks	LQ 004		Development of model to assess short-term risks to human health.
Buildings Risk	LQ 005		Guidance on assessing and managing risks from contamination to building materials including specific regulatory guidance for Part IIA.
Ecosystem Risk from Contaminated Land	LQ 006	ECORCL	To assess the risks to ecosystems from contaminated sites.
ConSim	LQ 007	ConSim	ConSim has been developed to help an assessor predict the impact of leaching of contaminants from land contamination on the quality of controlled waters (and GW in particular). ConSim uses Monte Carlo techniques to provide probabilistic output of predicted impact on water quality arising from the migration of contaminants. ConSim considers biological, physical and chemical process (and 1st order radioactive decay if applicable) acting to attenuate pollutants within the system.
Methodology for the derivation of remedial targets for soil and groundwater to protect water resources.	LQ 008		Guidance on risk management requirements for contaminated soils and groundwater to prevent pollution of the aquatic environment. This methodology compliments the ConSim software tool.
Validation of Analytical Techniques for Laboratory Analysis of Soil.	LQ 009		To provide Quality Assurance in Laboratory Analysis of Soil.

TITLE	FORM REF.	ACRONYM	MODEL PURPOSE
River Quality Planning	WQ 001	RQP	A collection of stochastic programmes for predicting the impact of single discharges includes RQI and CONCLASS.
Simulation of Catchments	WQ 002	SIMCAT	The prime purpose is to calculate the effect of discharges and other types of pollution and abstractions on the statistical distributions of river water quality throughout a catchment. It is primarily used as a consent setting tool.
Temporal Overall Model for Catchments	WQ 003	TOMCAT	TOMCAT may be used as a tool for consent setting in order to achieve river quality standards and may also be used as a planning tool to model, for example, phosphate to assist targeting investment. It is an essential tool for calculating consent standard for effluent discharges in catchments where there might be several works affecting the river quality, or where it is important to predict dissolved oxygen levels.
Quality Simulation Along Rivers	WQ 004	QUASAR	QUASAR is a predictive model to assess the effect of developments and changes within the catchment (for example, drainage and sewerage changes - more stringent consents etc) on river quality. QUASAR may be used in both a dynamic and a planning capacity.
Estuarine (Contaminant) Shell	WQ 005	ECoS	ECoS is a shell or framework for modelling contaminants such as dangerous substances in estuaries.
MIKE - 1 Dimensional and 1 Layered	WQ 006	MIKE11	MIKE11 is an engineering software package for the simulation of flows, water quality and sediment transport in estuaries, rivers, irrigation systems, canals and other water bodies.
Quality of Estuaries Simulations	WQ 007	QUESTS	QUESTS models estuarine quality particularly with respect of discharges and how consent conditions may be determined to improve water quality and target investment.
TIDEWAY	WQ 008	TIDEWAY	2-D Vertical modelling in Estuaries.
Aggregated Dead Zone	WQ 009	ADZ	Assessing the time of arrival of a polluting discharge during an incident.
POLLUX	WQ 010	POLLUX	
Construction of Bunds for Oil Storage	WQ 011		To define cost effective storage protection facilities to reduce the risk of (oil) pollution of controlled waters.
Farm Activity and River Management System	WQ 012	FARMS I&II	FARMS I & II is a distributed catchment scale model to simulate the run-off of water and the transport of pollutants arising from farm wastes, into rivers. It is used for developing farm waste management plans.

TITLE	FORM REF.	ACRONYM	MODEL PURPOSE
Simulation of Catchments	WQ 013	SIMCAT	Stochastic modelling of water quality in catchments. It is used as a consent setting tool.
Temporal Overall Model for Catchments	WQ 014	TOMCAT	Stochastic modelling of water quality in catchments. It may be used as a tool for consent setting in order to achieve river quality standards and may also be used as a planning tool to model, for example, phosphate to assist targeting investment.
Incident Reaction Interface System	WQ 015	IRIS	IRIS is a time of travel calculation model for assessing the length of time taken for a pollutant to travel down a catchment to potable water intakes. The models primary function is for intake protection purposes.
Pollution Prevention Manual	WQ 016		To provide consistent guidance to all Environment Agency field officers on pollution prevention issues including site visits, risk assessment and risk management.
Pollution Prevention Site Visits	WQ 017		To assess and manage risk on wide ranging types of site to prevent pollution and improve water quality. All regions undertake some form of PP activity.
Works Notice Risk Assessment Forms	WQ 018		To provide a consistent basis for deciding whether a works notice should be served to prevent water pollution.
Prediction of Pesticide Pollution in the Environment	WQ 019	POPPIE	Prediction of Pesticide Pollution in the Environment.
FARM Pollution Prevention Visit Proforma	WQ 020		Consistent data collection of farm storage facilities and risk assessment of storage operations.
Pollution Risk from Accidental Influx to Rivers & Estuaries	WQ 021	PRAIRIE	To predict consequences of accidental releases of chemicals into water courses.
Urban Pollution Management Manual	WQ 022	UPM Manual	The UPM Manual is designed to deliver adequate environmental protection at least cost for intermittent discharges of urban sewage. This is achieved through the planning process and the use of specific tools developed for the purpose.
Decision Support Tool	WQ 023	DECIST	Make better decisions when deciding levels of data collection in urban pollution management studies.
Catchment Inventory system	WQ 024	CATCHIS	CATCHIS is a system for evaluating the risk of specific pesticides being present in specified surface water and groundwater locations.
Source Protection Zones models & maps	WQ 025	SPZs	Source Protection Zones have been developed to define areas in which activities could impact groundwater abstraction.

TITLE	FORM REF.	ACRONYM	MODEL PURPOSE
Groundwater Vulnerability Maps	WQ 026		Groundwater Vulnerability Maps have been produced to define the vulnerability of groundwater in any specific location regardless of use.
Rapid Risk Assessment Methodology	WQ 027		To provide consistent approach to risk assessment at industrial sites (non IPC sites).
Discharge Consent Manual	WQ 028		The discharge Consent Manual is a collection of Agency's policies for the determination of Consents for discharges. The Manual covers the legal & technical basics for ensuring the protection of WQ. The manual is a dynamic document subject to continual reviews & addition.

TITLE	FORM REF.	ACRONYM	MODEL PURPOSE
LandSim	WP 001	LandSim	LandSim allows the assessor to predict the impact of pollutants in a landfill site on the quality of controlled waters (particularly groundwater). The model considers leachate chemistry, engineering performance of containment and leachate collection systems and processes acting in the unsaturated zone to attenuate pollutants before they reach the waterhole.
OPRA for Waste	WP 002	OPRA for Waste	OPRA for Waste provides a straightforward characterisation of the overall environmental risk from waste disposal or recovery operations by providing an indication of an occurrence of an undesirable event and the consequences of the event. These factors are combined to give an indication of comparative risks and are used to determine the frequency of inspections at sites.

TITLE	FORM REF.	ACRONYM	MODEL PURPOSE
Flood Defence Management System	FD 001	FDMS	The main purpose is to identify the need for capital/revenue expenditure and to determine the prioritisation and justification of that expenditure.
Flood Studies Report (PC Based)	FD 002	MICROFSR	FSR is used for estimation of design flows for ungauged catchments. Flows are estimated at one point in the catchment only.
River Basin Management Model	FD 003	RIBAMAN	FSR is used for estimation of design flows for ungauged catchments. Flows are estimated at one point in the catchment only.
Frequency Simulation (of Flood Flows)	FD 004	FRQSIM	FSR is used for estimation of design flows for ungauged catchments. Flows are estimated at one point in the catchment only.
Rainfall Run-off (on Burrows Computer)	FD 005	RORB	RORB is used for estimation of design flows on catchments with some gauging.
Regional Flow-Forecasting system	FD 006		The Regional Flow-Forecasting System relies on output from one of three models (Isolated Event Model/Thames Conceptual Model/Probability Model) to forecast flood events in river catchment zones.
ISIS	FD 007	ISIS	ISIS has been developed from ONDA and SALMON and it models flows, water quality and sediment transport in complex river and channel networks.
Hydrological Engineering Centre 2	FD 008	HEC 2	HEC 2 is a backwater model for ascertaining water levels along a reach of river or open channel for a steady flow rate.
Backwater Programs (Generic)	FD 009		Backwater programs are used to estimate water levels given in-channel geometry and roughness and a steady flow.
MIKE – 2 Dimensional and 1 Layered	FD 010	MIKE21	MIKE21 is a comprehensive modelling system for 2D free surface flows and is applicable to hydraulic and related phenomena in lakes, estuaries, bays and coastal areas.
NAM (Hydrological Model)	FD 011	NAM	NAM is a deterministic conceptual lumped model representing the land phase of the hydrological cycle. It is based on physical and semi empirical formulations.
Forecasting Rain Optimised using New Techniques of Interactively Enhanced Radar and Satellite Data.	FD 012	FRONTIERS	FRONTIERS is a model that provides high-resolution quantitative rainfall forecasts for flow prediction.
Local Rainfall Forecasting System	FD 013		The Local Rainfall Forecasting System is an advection model that models the speed and direction of rainfall and can forecast up to two hours ahead.

TITLE	FORM REF.	ACRONYM	MODEL PURPOSE
Generating Advanced Non-Casts for Deployment in Operational Land-surface Flood-Forecasting	FD 014	GANDALF	GANDALF is an operational thunderstorm warning procedure for use with river flood forecasting systems.
Simple Practical Application of Collective Experience (Rapid Risk Assessment Methodology)	FD 015	SPACE	SPACE is a technique for assessing risk to flood defences, including the risk of failure of such flood defences.
Risk Assessment for Sea and Tidal Defences	FD 016		This methodology has been developed to provide a detailed quantitative risk assessment procedure including probabilistic failure analysis and assessment of areas of flooding. This methodology is designed to compliment the SPACE Methodology and act as a second tier detailed assessment.
Indicative Floodplain Maps	FD 017	IFM	Show areas within which the Agency carries out flood defence function (coastal and fluvial) in accordance with Circular 30/92.
Flood Estimation Handbook	FD 020	FEH	FEH is used for estimation of design flows for ungauged sites. It is a development of the flood standing report.
Database of Erosion Deposition and Flooding	FD 021		Database of 1500 reported flooding and erosion events in Britain from 1770 to present. Developed by DETR to inform planning guidance.

TITLE	FORM REF.	ACRONYM	MODEL PURPOSE
River Habitat Survey	CO 001	RHS	To determine River habitat quality in the context of river type and level of physical modification.
River Corridor Survey	CO 002	RCS	To provide information on the plant communities and land use along watercourses.
Landscape Assessment	CO 003		To provide information on landscape character of river corridors.
Habitats Directive Review	CO 004		To review all consents / activities affecting Habitats and Birds Directive sites
Planning applications screening process	CO 005		To prioritise planning applications for consultation with conservation staff.

TITLE	FORM REF.	ACRONYM	MODEL PURPOSE
FLOWPATH	WR 001	FLOWPATH	Flowpath is a propriatory model which is applied in the determination of Groundwater Protection Zones. The model may also be applied in groundwater pollution incident investigation. It is a 2D steady state numerical groundwater flow model.
MODFLOW/MODPATH	WR 002	MODFLOW	MODFLOW is a finite difference groundwater model for modelling time variant flow in anisotropic, heterogeneous, layered aquified systems. These models are 2D/3D Steady State/Time Variant Groundwater flow and particle backing models.
RESPLAN	WR 003		Least cost economic prioritisation of resource Development scheduling / resource allocation modelling
Finite Difference Code	WR 004	BU	BU is a finite difference groundwater model for modelling time/variant flow in anisotropic, heterogeneous, layered aquifer systems. These models are 2D/3D steady state/time variant groundwater flow and particle tracking method.
Integrated Catchment Management Model	WR 005	ICMM	This is a finite difference groundwater model for modelling transit flow in anisotropic, heterogeneous layered aquifer systems.
Single Layer Finite Difference Code.	WR 006	SLAY	This is a finite groundwater model for modelling transient flow in anisotropic, heterogeneous, single layered, aquifer systems.
MIKE – System Hydrologique Europeane	WR 007	MIKE SHE	MIKE SHE is a dynamic modelling tool for the analysis planning and management of water resources and environmental problems related to surface water and groundwater, in particular to assess potential impact of human activities.
Well Head Protection Area	WR 008	WHPA	The Well Head Protection Area Model is utilised for derivation of Groundwater Protection Zones. The model is a 2D steady state numerical groundwater flow model.
Surface Water Abstraction Licensing Procedure	WR 009	SWALP	The determination of surface water abstraction licence applications
Micro Low Flows V21	WR 009		Used to estimate natural and artificial infiltrated flow statistics at ungauged river sites.
Water Resources Model	WR 010	WRM	Water Resources Planning. WRM helps evaluate the capability of existing and proposed WR Development toward meeting target levels of service of consumption given existing and forecast demands against known hydrologic performance.

TITLE	FORM REF.	ACRONYM	MODEL PURPOSE
Thames Catchment Model River Flow Generation	WR 011		To generate sequences of possible future river flows for different rainfall scenarios used in conjunction with the Thames WR model (for reservoirs). River Flows + reservoirs = Drought Management Model.
Drought Management System	WR 012	DMS	Operational planning and management of water resources. Provides a broad assessment of risk of resource/supply failure given statistical likelihood of different rainfall scenarios given actual reservoir storage and run off at that time.
Bursts and Background Estimates	WR 013	BABE .	To estimate the level of leakage of water from distribution system.
Demand Forecasting Model	WR 014	DFM	To forecast public water supply demands for the future.

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Environmental Impact Assessment

Form Ref: SR001

2. Model Purpose

Acronym: EIA

Technical guidance on scoping and a comparison volume on further prescriptive guidance to primarily assist external developers on how to assess the environmental impact of projects and schemes, how to reduce risks to the environment from such schemes, and how best to develop mitigating measures.

Users: Operational, functional + planning liaison staff. Mainly used by externals / eg. consultants, industry, although it applies to Agency when considering a development.

Frequency		Development		License	
Routine	✓	None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised	✓	Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air	✓	Water Quality	✓	Qualitative	✓
Land	✓	Water Resources	✓	Semi-Quantitative	✓
Water	✓	Flood Defence	✓	Quantitative	
Waste	✓	Fisheries	✓	Criteria	
		Rec & Nav	✓	Assessment	✓
Purpose		Conservation	✓	Probabilistic/Determ	✓
Regulation	✓	PIR	✓	Stochastic	
Operational	✓	Radioactivity	✓	Risk Assessment	✓
Planning	✓	Waste Policy	✓	Risk Management	✓
Prioritising	✓	Land Quality	✓		

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment	✓	Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale		Biological	✓	In-House	✓
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: DETR legislation + Guidance; other best practice guidance.

Databases:

6. Comments

Guidance documents are currently being updated and are due to be completed in the summer of 2000.

Contact: Andrew Brookes or Environmental Development Officer.

Location: NCRAOA

Tel: 710 6828

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Strategic Risk Assessment Methodology

Form Ref: SR002

2. Model Purpose

Acronym: SRAM

This methodology has been developed to enable comparative assessments of environmental impacts at the strategic level.

Users: Potential prioritisation of LEAPS

Frequency

Routine	
Periodic	
Occasionally	✓

Development

None	
Arguing revision	
Being revised	
Under development	

License

Licensed	N/A
If so, number	
Free	

3. General Assessment

Media

Air	✓
Land	✓
Water	✓
Waste	✓

Purpose

Regulation	
Operational	
Planning	
Prioritising	✓

Function

Water Quality	✓
Water Resources	✓
Flood Defence	✓
Fisheries	✓
Rec & Nav	✓
Conservation	✓
PIR	✓
Radioactivity	✓
Waste Policy	✓
Land Quality	✓

Risk Assessment

Qualitative	
Semi-Quantitative	✓
Quantitative	
Criteria	
Assessment	✓
Probabilistic/Determ	✓
Stochastic	
Risk Assessment	✓
Risk Management	

4. Further Assessment

Coverage

Site Specific	
Catchment	✓
Regional	✓
National	✓
Timescale	
Resolution	

Type

Procedural	✓
Mathematical	✓
Statistical	
Chemical	✓
Physical	✓
Biological	✓
Radioactivity	✓

System Base

Paper	✓
PC - DOS	
PC - Windows	✓
UNIX/Mainframe	
In-House	✓
Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Dependent upon the type of intention and consequence.

Databases: Dependent upon the type of intention and consequences.

6. Comments

This methodology is currently under development but has reached proof of concept stage and been piloted on LEAPS and on the state of the Environment Report.

Contact: Simon Pollard

Location: NCRAOA

Tel: 710 6832

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title R&D Prioritisation spreadsheet — **Form Ref** OTH 001

2. Model Purpose — **Acronym**

To provide a standard, consistent method for collating and prioritising R&D proposals based on the Agency.

Users: R&D Programme Officers & Topic Leaders

Frequency		Development		License	
Routine		None		Licensed	
Periodic	✓	Arguing revision	✓	If so, number	
Occasionally		Being revised		Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air	✓	Water Quality	✓	Qualitative	
Land	✓	Water Resources	✓	Semi-Quantitative	✓
Water	✓	Flood Defence	✓	Quantitative	
Waste	✓	Fisheries	✓	Criteria	
		Rec & Nav		Assessment	
Purpose		Conservation	✓	Probabilistic/Determ	
Regulation		PIR	✓	Stochastic	
Operational		Radioactivity	✓	Risk Assessment	
Planning		Waste Policy	✓	Risk Management	
Prioritising		Land Quality	✓		

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural	✓	Paper	
Catchment		Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	✓
National	✓	Chemical		UNIX/Mainframe	
		Physical			
Timescale		Biological		**In-House**	✓
Resolution		Radioactivity		**Third Party**	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards — Databases: R&D MIS

6. Comments

Contact: David Bird (R&D planning officer) — Location: Bristol — Tel: 7 10 4325

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title European Union system for the Evaluation of Substances, version 1.0.

Form Ref OTH002

2. Model Purpose

Acronym EUSES

Users: Chemicals Assessment Unit

Frequency		Development		License	
Routine	✓	None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised	✓	Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air	✓	Water Quality	✓	Qualitative	
Land	✓	Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR	✓	Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning		Waste Policy	✓	Risk Management	
Prioritising		Land Quality	✓		

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment		Mathematical	✓	PC - DOS	
Regional	✓	Statistical		PC - Windows	✓
National		Chemical	✓	UNIX/Mainframe	
		Physical			
Timescale		Biological		In-House	
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards PEC/PNEC ratio of 1

Databases None required.

6. Comments

EUSES is used to produce predicted environmental concentrations (PECs) for industrial chemicals on a local, regional and continental scale for a generic environment, and to compare these with predicted no effect concentrations (PNECs). A variety of release scenarios can be modeled from one-off to continuous. The model was developed by European Member States, the European Commission, and industry.

Contact Steve Robertson **Location:** NCEHS **Tel:** 01491 828 555

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Hull Acid Rain Model

Form Ref: PIR001

2. Model Purpose

Acronym: HARM

This model is used for the calculation of the concentration and deposition of sulphur and nitrogen pollutants over the UK and creating deposition maps.

Users: Under contract by Head Office

Frequency		Development		License	
Routine		None		Licensed	N/A
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised		Free	
		Under development	✓		

3. General Assessment

Media		Function		Risk Assessment	
Air	✓	Water Quality	✓	Qualitative	
Land	✓	Water Resources		Semi-Quantitative	
Water		Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Deterministic	✓
Regulation	✓	PIR	✓	Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional	✓	Statistical		PC - Windows	✓
National	✓	Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale	Annual	Biological		**In-House**	
Resolution	10km	Radioactivity		**Third Party**	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Air quality standards for sulphur dioxide and nitrogen oxides and critical loads

Databases: Land cover databases, altitude, and rainfall

6. Comments

This model is a derivation of the Harwell Trajectory Model. This model is currently used by the DETR, Air and Environment Quality division.

Contact: Dr Colin Powlesland

Location: London

Tel: 7 10 6827

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Meso and Regional Scale Pollutant dispersion and Deposition Model.

Form Ref: PIR002

2. Model Purpose

Acronym: NAME II

To calculate and forecast pollutant concentration and deposition. It is used for retrospective episodes of analysis of poor air quality.

Users: Regional PIR Officers

Frequency		Development		License	
Routine		None	✓	Licensed	N/A
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air	✓	Water Quality		Qualitative	
Land		Water Resources		Semi-Quantitative	
Water		Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Deterministic	✓
Regulation		PIR	✓	Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment		Mathematical	✓	PC - DOS	
Regional	✓	Statistical		PC - Windows	
National	Global	Chemical	✓	UNIX/Mainframe	✓
		Physical	✓		
Timescale		Biological		**In-House**	
Resolution		Radioactivity		**Third Party**	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: AQS: Sulphur and Nitrogent Critical Loads

Databases: Based on the global forecasting model and draws on global and European emission databases.

6. Comments

The Agency pays for the use of this model on a contract basis.

Contact: Jimi Irwin

Location: London

Tel: 7 10 6825

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: United Kingdom Air Dispersion Modelling System

Form Ref: PIR003

2. Model Purpose

Acronym: UKADMS

Calculation of short-term - long-term ground level pollutant concentrations for released to air (air dispersions model).

Users:

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air	✓	Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	
Water		Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Deterministic	✓
Regulation	✓	PIR	✓	Stochastic	
Operational		Radioactivity	✓	Risk Assessment	✓
Planning		Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional	✓	Statistical	✓	PC - Windows	✓
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale	seconds | year	Biological		**In-House**	✓
Resolution		Radioactivity	✓	**Third Party**	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: All relevant air quality standards and targets

Databases: METDATA from met office

6. Comments

Model was developed with a view to giving a more accurate picture of dispersion and to deal with complex topography.

Contact: Betty Ng

Location: Cardiff

Tel: 7 26 2017

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title

Form Ref: PIR004

2. Model Purpose

Acronym: AERM

Users:

Frequency

- Routine
- Periodic
- Occasionally

Development

- None
- Arguing revision
- Being revised
- Under development

License

- Licensed
- If so, number
- Free

3. General Assessment

Media

- Air
- Land
- Water
- Waste

Purpose

- Regulation
- Operational
- Planning
- Prioritising

Function

- Water Quality
- Water Resources
- Flood Defence
- Fisheries
- Rec & Nav
- Conservation
- PIR
- Radioactivity
- Waste Policy
- Land Quality

Risk Assessment

- Qualitative
- Semi-Quantitative
- Quantitative
- Criteria
- Assessment
- Probabilistic/Determ
- Stochastic
- Risk Assessment
- Risk Management

4. Further Assessment

Coverage

- Site Specific
- Catchment
- Regional
- National

Timescale

- Resolution

Type

- Procedural
- Mathematical
- Statistical
- Chemical
- Physical
- Biological
- Radioactivity

System Base

- Paper
- PC - DOS
- PC - Windows
- UNIX/Mainframe

In-House

Third Party

5. Links to Standards, Targets and Databases (Cross-reference)

Standards

Databases

6. Comments

Contact: Betty Ng

Location: Cardiff

Tel: 7 26 2017

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title

Form Ref PIR005

2. Model Purpose

Acronym SURSER

Users:

Frequency

- Routine
- Periodic
- Occasionally

Development

- None
- Arguing revision
- Being revised
- Under development

License

- Licensed
- If so, number
- Free

3. General Assessment

Media

- Air
- Land
- Water
- Waste

Purpose

- Regulation
- Operational
- Planning
- Prioritising

Function

- Water Quality
- Water Resources
- Flood Defence
- Fisheries
- Rec & Nav
- Conservation
- PIR
- Radioactivity
- Waste Policy
- Land Quality

Risk Assessment

- Qualitative
- Semi-Quantitative
- Quantitative
- Criteria
- Assessment
- Probabilistic/Determ
- Stochastic
- Risk Assessment
- Risk Management

4. Further Assessment

Coverage

- Site Specific
- Catchment
- Regional
- National

- Timescale
- Resolution

Type

- Procedural
- Mathematical
- Statistical
- Chemical
- Physical
- Biological
- Radioactivity

System Base

- Paper
- PC - DOS
- PC - Windows
- UNIX/Mainframe

- In-House
- Third Party

5. Links to Standards, Targets and Databases (Cross-reference)

Standards

Databases

6. Comments

Contact: Betty Ng

Location: Cardiff

Tel: 726 2017

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title

Form Ref PIR006

2. Model Purpose

Acronym DISTAR

Users:

Frequency

- Routine
- Periodic
- Occasionally

Development

- None
- Arguing revision
- Being revised
- Under development

License

- Licensed
- If so, number
- Free

3. General Assessment

Media

- Air
- Land
- Water
- Waste

Purpose

- Regulation
- Operational
- Planning
- Prioritising

Function

- Water Quality
- Water Resources
- Flood Defence
- Fisheries
- Rec & Nav
- Conservation
- PIR
- Radioactivity
- Waste Policy
- Land Quality

Risk Assessment

- Qualitative
- Semi-Quantitative
- Quantitative
- Criteria
- Assessment
- Probabilistic/Determ
- Stochastic
- Risk Assessment
- Risk Management

4. Further Assessment

Coverage

- Site Specific
- Catchment
- Regional
- National

- Timescale
- Resolution

Type

- Procedural
- Mathematical
- Statistical
- Chemical
- Physical
- Biological
- Radioactivity

System Base

- Paper
- PC - DOS
- PC - Windows
- UNIX/Mainframe

- **In-House**
- **Third Party**

5. Links to Standards, Targets and Databases (Cross-reference)

Standards

Databases

6. Comments

Contact Betty Ng

Location: Cardiff

Tel: 7 26 2017

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Operator and Pollution Risk Appraisal

Form Ref: PIR007

2. Model Purpose

Acronym: OPRA

OPRA assess several aspects of the performance of an operator to provide an indication of probability of an occurrence of an undesirable event and the consequences of the event. These factors are combined to give an indication of comparative risks.

Users: Pollution Officers

Frequency		Development		License	
Routine		None		Licensed	
Periodic	✓	Arguing revision	✓	If so, number	
Occasionally		Being revised		Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air	✓	Water Quality		Qualitative	
Land	✓	Water Resources		Semi-Quantitative	✓
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	
Regulation	✓	PIR	✓	Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment		Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical			
Timescale		Biological		**In-House**	✓
Resolution		Radioactivity		**Third Party**	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Target. Target on function use operational performance measure (OPM). OPRA as a tool.

Databases:

6. Comments

OPRA consists of two main components - the Operator Performance Appraisal and the Pollution Hazard Appraisal Information stored in IPCS.

Contact: C Corbishley

Location: Bristol

Tel: 710 4472

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Uniform System for the Evaluation of Substances

Form Ref: PIR008

2.. Model Purpose

Acronym: USES

USES is a tool that can be used for rapid quantitative assessments of the general risks of substances. USES may be applied to risk assessment and to set priorities for new and existing substances.

Users:

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air	✓	Water Quality	✓	Qualitative	
Land	✓	Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR	✓	Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment		Mathematical	✓	PC - DOS	✓
Regional		Statistical		PC - Windows	
National	✓	Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale		Biological	✓	In-House	✓
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

6. Comments

Contact: Steve Robertson

Location: NC EHS Wallingford

Tel: 01491 828555

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Validity Analysis of Disposal Alternatives

Form Ref: RAS001

2. Model Purpose

Acronym: VANDAL

VANDAL is central to the Agency's quantitative risk assessment capability, providing estimates of risk to man, over long timescales, from radionuclide releases from radioactive waste disposal facilities.

Users: Risk Section, NCRAOA

Frequency		Development		License	
Routine		None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised		Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land	✓	Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste	✓	Fisheries		Criteria	✓
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR		Stochastic	✓
Operational		Radioactivity	✓	Risk Assessment	✓
Planning		Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional		Statistical	✓	PC - Windows	
National		Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		**In-House**	✓
Resolution		Radioactivity	✓	**Third Party**	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Risk target of 1×10^{-6} set in regulatory guidance

Databases:

6. Comments

This methodology is currently under development

Contact: Roger Yearsley

Location: London

Tel: 7 10 6833

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. **Title** WOLFNET — **Form Ref** RAS002

2. **Model Purpose** — **Acronym** WOLFNET

WOLFNET is the flow sub-model in VANDAL and provides groundwater flow predictions for the transport sub-model in VANDAL.

Users: Risk Section, NCRAOA.

Frequency

Routine	
Periodic	
Occasionally	✓

Development

None	✓
Arguing revision	
Being revised	
Under development	

License

Licensed	
If so, number	
Free	✓

3. **General Assessment**

Media

Air	
Land	
Water	✓
Waste	

Purpose

Regulation	✓
Operational	
Planning	
Prioritising	

Function

Water Quality	
Water Resources	
Flood Defence	
Fisheries	
Rec & Nav	
Conservation	
PIR	
Radioactivity	✓
Waste Policy	
Land Quality	

Risk Assessment

Qualitative	
Semi-Quantitative	
Quantitative	✓
Criteria	✓
Assessment	✓
Probabilistic/Determ	✓
Stochastic	✓
Risk Assessment	✓
Risk Management	

4. **Further Assessment**

Coverage

Site Specific	✓
Catchment	
Regional	
National	
Timescale	
Resolution	

Type

Procedural	
Mathematical	✓
Statistical	
Chemical	
Physical	✓
Biological	
Radioactivity	

System Base

Paper	
PC - DOS	✓
PC - Windows	
UNIX/Mainframe	
In-House	✓
Third Party	

5. **Links to Standards, Targets and Databases (Cross-reference)**

Standards As VANDAL — **Databases**

6. **Comments**

Sub-model of VANDAL

Contact Roger Yearsley — **Location:** London — **Tel:** 7 10 6833

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: DECOS-MG

Form Ref: RAS003

2. Model Purpose

Acronym: DECOS-MG

Dynamic modelling of radionuclide migration within the surface environment.

Users: NCRAOS - Risk Section

Frequency

Routine	
Periodic	
Occasionally	✓

Development

None	✓
Arguing revision	
Being revised	
Under development	

License

Licensed	
If so, number	
Free	✓

3. General Assessment

Media

Air	
Land	✓
Water	✓
Waste	

Purpose

Regulation	
Operational	
Planning	
Prioritising	

Function

Water Quality	
Water Resources	
Flood Defence	
Fisheries	
Rec & Nav	
Conservation	
PIR	
Radioactivity	✓
Waste Policy	
Land Quality	

Risk Assessment

Qualitative	
Semi-Quantitative	
Quantitative	✓
Criteria	✓
Assessment	✓
Probabilistic/Determ	✓
Stochastic	✓
Risk Assessment	✓
Risk Management	

4. Further Assessment

Coverage

Site Specific	✓
Catchment	
Regional	
National	

Timescale	
Resolution	

Type

Procedural	
Mathematical	✓
Statistical	
Chemical	
Physical	✓
Biological	✓
Radioactivity	✓

System Base

Paper	
PC - DOS	
PC - Windows	
UNIX/Mainframe	

In-House	✓
Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: As VANDAL

Databases: SECOS - dose conversion factors

6. Comments

Contact: Roger Yearsley

Location: London

Tel: 710 6833

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: TIME4 — Form Ref: RAS004

2. Model Purpose — Acronym: TIME4

This methodology is being developed to enable risk assessments for other techniques to be normalised in order to establish priorities across the remit of the Environment Agency.

Users: NCRAOA - Risk Section

Frequency		Development		License	
Routine		None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised		Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land	✓	Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	✓
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR		Stochastic	✓
Operational		Radioactivity	✓	Risk Assessment	✓
Planning		Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment		Mathematical	✓	PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		In-House	✓
Resolution		Radioactivity		Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: As VANDAL — Databases:

6. Comments

Contact: Roger Yearsley — Location: London — Tel: 7 10 6833

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Chemical Transport Adsorption Redox and Delay Model

Form Ref: RAS005

2. Model Purpose

Acronym: CHEMTARD

CHEMTARD is a coupled chemical transport code used to determine the migration of radionuclides through the geosphere.

Users: NCRAOA - Risk Section

Frequency		Development		License	
Routine		None	✓	Licensed	
Periodic	✓	Arguing revision		If so, number	
Occasionally		Being revised		Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR	✓	Stochastic	
Operational		Radioactivity		Risk Assessment	
Planning		Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment		Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical	✓	UNIX/Mainframe	✓
		Physical	✓		
Timescale		Biological		**In-House**	
Resolution		Radioactivity	✓	**Third Party**	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: None

Databases: CHEMVAL - thermodynamic database

6. Comments

CHEMTARD has been used to model at both laboratory and field scale transport of radionuclides and, more generally heavy metals in a contaminated aquifer.

Contact: Roger Yearsley

Location: London

Tel: 7 10 6833

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. **Title** pH Redox Equilibrium Equations — **Form Ref** RAS006

2. **Model Purpose** — **Acronym** PHREEQE

The PHREEQE computer program is designed to modelling geochemical reactions. Based on an ion pairing model, PHREEQE can calculate pH, redox potential, and mass transfer as a function of reaction progress.

Users: NCRAOA - Risk Section

Frequency

Routine	
Periodic	
Occasionally	✓

Development

None	✓
Arguing revision	
Being revised	
Under development	

License

Licensed	
If so, number	
Free	✓

3. **General Assessment**

Media

Air	
Land	
Water	✓
Waste	

Purpose

Regulation	✓
Operational	
Planning	
Prioritising	

Function

Water Quality	
Water Resources	
Flood Defence	
Fisheries	
Rec & Nav	
Conservation	
PIR	
Radioactivity	✓
Waste Policy	
Land Quality	

Risk Assessment

Qualitative	
Semi-Quantitative	
Quantitative	✓
Criteria	
Assessment	
Probabilistic/Determ	
Stochastic	
Risk Assessment	
Risk Management	

4. **Further Assessment**

Coverage

Site Specific	✓
Catchment	
Regional	
National	
Timescale	
Resolution	

Type

Procedural	
Mathematical	
Statistical	
Chemical	✓
Physical	
Biological	
Radioactivity	

System Base

Paper	
PC - DOS	
PC - Windows	
UNIX/Mainframe	✓
In-House	
Third Party	

5. **Links to Standards, Targets and Databases (Cross-reference)**

Standards — **Databases**

6. **Comments**

Contact Roger Yearsley — **Location:** London — **Tel:** 7 10 6833

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Part IIA EPA 1990. Handbook. Guidance Notes and Supporting Manuals.

Form Ref: LQ001

2. Model Purpose

Acronym:

To describe the process to be adopted by the Agency when exercising regulatory control under the contaminated land provisions of Part IIA of the Environmental Protection Act 1990. The Handbook also provides links to associated Agency documentation (ie guidance notes and supporting manuals).

Users: Agency staff and made available externally (eg local authorities)

Frequency		Development		License	
Routine	✓	None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised	✓	Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land	✓	Water Resources		Semi-Quantitative	✓
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	✓
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	
Regulation	✓	PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	✓
Prioritising		Land Quality	✓		

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment		Mathematical		PC - DOS	
Regional	✓	Statistical		PC - Windows	
National	✓	Chemical	✓	UNIX/Mainframe	
		Physical			
Timescale		Biological		In-House	✓
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases: Links to CLEA CONSIM/LANSIM & other model procedure tools hand legislation

6. Comments

*to agency staff but externals may incur costs.

Contact: S. Herbert

Location: Bristol

Tel: 710 4487

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Model Procedures for the Management of Contaminated Land.

Form Ref: LQ002

2. Model Purpose

Acronym:

To provide a structured framework and procedural guidance for the identification, treatment and monitoring of contaminated land.

Users: Widespread use

Frequency		Development		License	
Routine	✓	None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	✓
Land	✓	Water Resources		Semi-Quantitative	✓
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	✓
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	
Regulation	✓	PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	✓
Prioritising	✓	Land Quality	✓		

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment		Mathematical		PC - DOS	
Regional	✓	Statistical		PC - Windows	
National	✓	Chemical	✓	UNIX/Mainframe	
		Physical			
Timescale	N/A	Biological		In-House	✓
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Other EQOs and QA Standards

Databases: Links to CLEA, Consim, The Integrated Methodology, etc..

6. Comments

Completed but with DETR for publication (date not known). No licence required but must pay cost of buying.

Contact: Mark Kibblewhite

Location: Bristol

Tel: 7 10 4492

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Contaminated Land Exposure Assessment

Form Ref: LQ003

2. Model Purpose

Acronym: CLEA

Estimating likely human exposure for contaminants in soils for the development of guideline values to indicate whether there are any unacceptable long term risks to human health.

Users: None

Frequency

Routine	
Periodic	
Occasionally	

Development

None	
Arguing revision	
Being revised	✓
Under development	

License

Licensed	N/A
If so, number	
Free	

3. General Assessment

Media

Air	
Land	✓
Water	
Waste	

Purpose

Regulation	✓
Operational	
Planning	
Prioritising	✓

Function

Water Quality	
Water Resources	
Flood Defence	
Fisheries	
Rec & Nav	
Conservation	
PIR	
Radioactivity	
Waste Policy	
Land Quality	✓

Risk Assessment

Qualitative	
Semi-Quantitative	
Quantitative	✓
Criteria	✓
Assessment	
Probabilistic/Determ	✓
Stochastic	✓
Risk Assessment	✓
Risk Management	

4. Further Assessment

Coverage

Site Specific	✓
Catchment	
Regional	
National	
Timescale	
Resolution	

Type

Procedural	
Mathematical	✓
Statistical	✓
Chemical	✓
Physical	
Biological	✓
Radioactivity	

System Base

Paper	
PC - DOS	
PC - Windows	✓
UNIX/Mainframe	
In-House	
Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Used to derive site-specific standards and national generic assessment criteria

Databases: Links to SVI model toxicological data

6. Comments

The model has been specifically developed with UK parameters and application for generic and site specific uses. The model has competitors from overseas (HESP and AERIS Canadian soil models). It incorporates features from both models.

Contact: Mark Kibblewhite

Location: Bristol

Tel: 7 10 4492

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title Short - Term Risks

Form Ref LQ004

2. Model Purpose

Acronym

Development of model to assess short-term risks to human health.

Users:

Frequency

Routine	
Periodic	✓
Occasionally	

Development

None	
Arguing revision	
Being revised	
Under development	✓

License

Licensed	N/A
If so, number	
Free	

3. General Assessment

Media

Air	
Land	✓
Water	
Waste	

Purpose

Regulation	✓
Operational	
Planning	
Prioritising	

Function

Water Quality	
Water Resources	
Flood Defence	
Fisheries	
Rec & Nav	
Conservation	
PIR	
Radioactivity	
Waste Policy	
Land Quality	✓

Risk Assessment

Qualitative	
Semi-Quantitative	
Quantitative	
Criteria	✓
Assessment	✓
Probabilistic/Determ	
Stochastic	
Risk Assessment	✓
Risk Management	

4. Further Assessment

Coverage

Site Specific	✓
Catchment	
Regional	
National	
Timescale	
Resolution	

Type

Procedural	✓
Mathematical	
Statistical	
Chemical	✓
Physical	
Biological	
Radioactivity	

System Base

Paper	✓
PC - DOS	
PC - Windows	
UNIX/Mainframe	
In-House	
Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Model procedures Part IIA Regulation Handbook

Databases: Interface with CLEA.

6. Comments

Contact: Sue Herbert

Location: Bristol

Tel: 7 10 4487

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Buildings Risk

Form Ref: LQ005

2. Model Purpose

Acronym:

Guidance on assessing and managing risks from contamination to building materials including specific regulatory guidance for Part IIA.

Users: Widespread use including regulators.

Frequency		Development		License	
Routine		None		Licensed	N/A
Periodic	✓	Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development	✓		

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	✓
Land	✓	Water Resources		Semi-Quantitative	
Water		Flood Defence		Quantitative	
Waste		Fisheries		Criteria	✓
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	
Regulation	✓	PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	✓
Prioritising		Land Quality	✓		

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment		Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		**In-House**	
Resolution		Radioactivity		**Third Party**	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Part IIA Handbook Model Procedures

Databases:

6. Comments

Contact: S. Herbert

Location: Bristol

Tel: 7 10 4487

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Ecosystem Risks from Contaminated Land

Form Ref: LQ006

2. Model Purpose

Acronym: ECORCL

To assess the risks to ecosystems from contaminated sites

Users: Land Quality Staff, External Users

Frequency

Routine	
Periodic	
Occasionally	✓

Development

None	
Arguing revision	
Being revised	
Under development	✓

License

Licensed	
If so, number	
Free	✓

3. General Assessment

Media

Air	
Land	✓
Water	
Waste	✓

Purpose

Regulation	✓
Operational	
Planning	
Prioritising	

Function

Water Quality	
Water Resources	
Flood Defence	
Fisheries	
Rec & Nav	
Conservation	
PIR	
Radioactivity	✓
Waste Policy	
Land Quality	✓

Risk Assessment

Qualitative	
Semi-Quantitative	✓
Quantitative	
Criteria	
Assessment	✓
Probabilistic/Determ	
Stochastic	
Risk Assessment	✓
Risk Management	

4. Further Assessment

Coverage

Site Specific	✓
Catchment	
Regional	
National	
Timescale	
Resolution	

Type

Procedural	✓
Mathematical	
Statistical	
Chemical	✓
Physical	
Biological	✓
Radioactivity	

System Base

Paper	✓
PC - DOS	
PC - Windows	
UNIX/Mainframe	
In-House	
Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Various reference 'levels' available

Databases: Various ecotox databases

6. Comments

Contact: R. Boumphrey

Location: NC EHS Wallingford

Tel: 725 8538

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: ConSim

Form Ref: LQ007

2. Model Purpose

Acronym: ConSim

ConSim has been developed to help an assessor predict the impact of leaching of contaminants from land contamination on the quality of controlled waters (and GW in particular). ConSim uses Monte Carlo techniques to provide probabilistic output of predicted impact on water quality arising from the migration of contaminants. ConSim considers biological, physical and chemical process (and 1st order radioactive decay if applicable) acting to attenuate pollutants within the system.

Users: WQ/LQ operational staff. Consultants

Frequency		Development		License	
Routine		None	✓	Licensed	
Periodic	✓	Arguing revision		If so, number	
Occasionally		Being revised		Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	
Regulation	✓	PIR		Stochastic	✓
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality	✓		

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment		Mathematical	✓	PC - DOS	
Regional		Statistical		PC - Windows	✓
National		Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale		Biological	✓	In-House	✓
Resolution		Radioactivity	✓	Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: WQ standards

Databases:

6. Comments

Agency owned tool.

Contact: Jonathon Smith

Location: NGWCLC

Tel: 722 4753

Environment Agency
Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title Methodology for the derivation of remedial targets for soil an groundwater to protect water resources.

Form Ref LQ008

2. Model Purpose

Acronym

Guidance on risk management requirements for contaminated soils and groundwater to prevent pollution of the aquatic environment. This methodology compliments the ConSim software tool.

Users: WQ, Environmental, Operational, Planning staff and environmental protection officers, Consultants, Industry.

Frequency		Development		License	
Routine		None	✓	Licensed	
Periodic	✓	Arguing revision		If so, number	
Occasionally		Being revised		Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land	✓	Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	
Purpose		Conservation		Deterministic	✓
Regulation	✓	PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	
Planning	✓	Waste Policy		Risk Management	✓
Prioritising	✓	Land Quality	✓		

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment		Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale		Biological	✓	**In-House**	✓
Resolution		Radioactivity		**Third Party**	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: WQS

Databases: Compliments The ConSim Software tool.

6. Comments

Contact: Jonathon Smith Location: NGWCLC Tel: 722 4753

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Validation of Analytical Techniques for Laboratory Analysis of Soil.

Form Ref: LQ009

2. Model Purpose

Acronym:

To provide Quality Assurance in Laboratory Analysis of Soil.

Users:

Frequency		Development		License	
Routine		None		Licensed	N/A
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development	✓		

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land	✓	Water Resources		Semi-Quantitative	
Water		Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	✓
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	
Prioritising		Land Quality	✓		

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural	✓	Paper	✓
Catchment		Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National	✓	Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale	N/A	Biological		In-House	
Resolution	N/A	Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Support Guideline Values, Model Procedures & Part IIA Regulation Handbook

Databases:

6. Comments

Cross relates to work done by DTI on valid analytical measurements.

Contact: Mark Kibblewhite

Location: Bristol

Tel: 7 10 4492

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: River Quality Planning

Form Ref: WQ001

2. Model Purpose

Acronym: RQP

A collection of stochastic programmes for predicting the impact of single discharges includes RQI, and CONCLASS.

Users: All regions

Frequency

Routine	✓
Periodic	
Occasionally	

Development

None	
Arguing revision	
Being revised	✓
Under development	

License

Licensed	
If so, number	
Free	✓

3. General Assessment

Media

Air	
Land	
Water	✓
Waste	

Purpose

Regulation	✓
Operational	✓
Planning	
Prioritising	

Function

Water Quality	✓
Water Resources	
Flood Defence	
Fisheries	
Rec & Nav	
Conservation	
PIR	
Radioactivity	
Waste Policy	
Land Quality	

Risk Assessment

Qualitative	
Semi-Quantitative	
Quantitative	✓
Criteria	
Assessment	✓
Deterministic	
Stochastic	✓
Risk Assessment	
Risk Management	

4. Further Assessment

Coverage

Site Specific	✓
Catchment	
Regional	
National	
Timescale	
Resolution	

Type

Procedural	
Mathematical	✓
Statistical	✓
Chemical	✓
Physical	
Biological	
Radioactivity	

System Base

Paper	
PC - DOS	
PC - Windows	✓
UNIX/Mainframe	
In-House	✓
Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: EQS' River Ecosystem (RE)
General QualityAssessment (GQA)

Databases: WQ Archives

6. Comments

Contact: Dr Tony Warn

Location: Peterborough

Tel: 7 50 4235

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Simulation of Catchments

Form Ref: WQ002

2. Model Purpose

Acronym: SIMCAT

The prime purpose is to calculate the effect of discharges and other types of pollution and abstractions on the statistical distributions of river water quality throughout a catchment. It is primarily used as a consent setting tool.

Users: Anglian, Midlands, Thames, Southern, North West.

Frequency		Development		License	
Routine	✓	None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised	✓	Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Deterministic	
Regulation	✓	PIR		Stochastic	✓
Operational	✓	Radioactivity		Risk Assessment	
Planning	✓	Waste Policy		Risk Management	✓
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional		Statistical	✓	PC - Windows	✓
National		Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale	Min 3 Max 5	Biological		In-House	✓
Resolution	100m	Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: River standards (expressed as means and percentiles) and site specific targets

Databases: SIMCAT relies on river specific data files for flow and quality data and also uses data from WQ archive.

6. Comments

SIMCAT is auto calibrating and therefore very quick to set up. SIMCAT calculates automatically the statistical confidence limits for each result. SIMCAT automatically calculates the consents required to meet River Quality

Contact: Dr Tony Warn

Location: Peterborough

Tel: 7 50 4235

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Temporal Overall Model for Catchments

Form Ref: WQ003

2. Model Purpose

Acronym: TOMCAT

TOMCAT may be used as a tool for consent setting in order to achieve river quality standards and may also be used as a planning tool to model, for example, phosphate to assist targetting investment. It is an essential tool for calculating consent standard for effluent discharges in catchments where there might be several works affecting the river quality, or where it is important to predict dissolved oxygen levels.

Users: North East, Thames, Southern, North West

Frequency		Development		License	
Routine	✓	None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised	✓	Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic	✓
Regulation	✓	PIR	✓	Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical	✓	PC - Windows	
National		Chemical	✓	UNIX/Mainframe	
		Physical	✓		
		Biological			
Timescale	Max 1 yr Max 3 yr	Radioactivity		In-House	✓
Resolution	500km reaches			Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases: MARIGOLD has been written to convert raw data in distributions for TOMCAT. TOMCAT also has a front end called TOMFRONT

6. Comments

TOMCAT is undergoing further developments to deal with the effects of algae in water resources. Currently there are three different versions available.

Contact	Location:	Tel:
Richard Freestone	Leeds	728 4671
Julianne Struve	Reading	725 5341

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Quality Simulation Along Rivers

Form Ref: WQ004

2. Model Purpose

Acronym: QUASAR

QUASAR is a predictive model to assess the effect of developments and changes within the catchment (for example, drainage and sewerage changes - more stringent consents etc) on river quality. QUASAR may be used in both a dynamic and a planning capacity.

Users: South West

Frequency

Routine	✓
Periodic	
Occasionally	

Development

None	
Arguing revision	
Being revised	✓
Under development	

License

Licensed	✓
If so, number	8
Free	

3. General Assessment

Media

Air	
Land	
Water	✓
Waste	

Purpose

Regulation	✓
Operational	
Planning	✓
Prioritising	✓

Function

Water Quality	✓
Water Resources	✓
Flood Defence	
Fisheries	
Rec & Nav	
Conservation	
PIR	✓
Radioactivity	
Waste Policy	
Land Quality	

Risk Assessment

Qualitative	
Semi-Quantitative	
Quantitative	✓
Criteria	
Assessment	✓
Probabilistic/Determ	✓
Stochastic	✓
Risk Assessment	✓
Risk Management	

4. Further Assessment

Coverage

Site Specific	✓
Catchment	✓
Regional	
National	

Timescale	timestep is days
Resolution	300m reaches

Type

Procedural	
Mathematical	✓
Statistical	✓
Chemical	✓
Physical	✓
Biological	✓
Radioactivity	

System Base

Paper	
PC - DOS	✓
PC - Windows	✓
UNIX/Mainframe	

In-House	✓
Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases: QUASAR relies on raw data from both the Water Quality and Quantity archieves.

6. Comments

This software was developed by the Institute of Hydrology and is currently being fundamentally revised as part of the LOIS Project. The new version will be called QUESTOR which will be more widely available.

Contact: Neil Murdoch

Location: Exeter

Tel: 724 2345

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Estuarine (Contaminant) Shell

Form Ref: WQ005

2. Model Purpose

Acronym: ECoS

ECoS is a shell or framework for modelling contaminants such as dangerous substances in estuaries.

Users: South West, West, Southern

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised	✓	Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	✓
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Deterministic	✓
Regulation	✓	PIR		Stochastic	✓
Operational		Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment		Mathematical	✓	PC - DOS	✓
Regional		Statistical	✓	PC - Windows	✓
National		Chemical	✓	UNIX/Mainframe	✓
		Physical	✓		
Timescale	timestep in days	Biological		In-House	✓
Resolution	1km reaches	Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: EQSs & Informal Regional Targets

Databases: Raw data from Water Quality Archive.

6. Comments

The use of this software has been modest to date, further development is being undertaken to include the sanitory suite of determinants. The software has been used by Welsh Region to design sampling programmes.

Contact: Richard Freestone

Location: Leeds

Tel: 728 4671

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: MIKE - 1 Dimensional and 1 Layered

Form Ref: WQ006

2. Model Purpose

Acronym: MIKE11

MIKE11 is an engineering software package for the simulation of flows, water quality and sediment transport in estuaries, rivers, irrigation systems, canals and other water bodies.

Users: Regions

Frequency		Development		License	
Routine		None		Licensed	✓
Periodic	✓	Arguing revision	✓	If so, number	16
Occasionally	✓	Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Deterministic	✓
Regulation	✓	PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional		Statistical	✓	PC - Windows	✓
National		Chemical	✓	UNIX/Mainframe	✓
		Physical	✓		
Timescale		Biological		**In-House**	
Resolution		Radioactivity		**Third Party**	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

6. Comments

MIKE11 is a modular system which includes a GIS interface. Produced by DHI and supported in the UK by WS Atkins It is used in the UPM methodology for the most complex situations. Future developments likely but may not be via WS Atkins. It is used periodically by water quality and occasionally by flood defence.

Contact: David Rylands (FD) Trevor Hardy (WQ)

Location: Reading

Tel: 725 5752

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Quality of Estuaries Simulations

Form Ref: WQ007

2. Model Purpose

Acronym: QUESTS

QUESTS models estuarine quality particularly with respect of discharges and how consent conditions may be determined to improve water quality and target investment.

Users: North East, Anglian, Midlands

Frequency		Development		License	
Routine	✓	None		Licensed	✓
Periodic		Arguing revision	✓	If so, number	3 or 4
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Deterministic	✓
Regulation	✓	PIR		Stochastic	✓
Operational		Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical	✓	PC - Windows	✓
National		Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale	1 hour timestep	Biological	✓	In-House	✓
Resolution	2km reaches	Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: EQSs & Informal Regional Targets

Databases: Raw data from Water Quality Archive TDF data processing facility.

6. Comments

This software has been developed by WRc and is used widely within the Agency under licence. Use for non stratified estuaries.

Contact: Richard Freestone

Location: Leeds

Tel: 728 4671

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: TIDEWAY

Form Ref: WQ008

2. Model Purpose

Acronym: TIDEWAY

2-D Vertical modelling in Estuaries.

Users: NE, THAMES, NORTH WEST

Frequency		Development		License	
Routine		None		Licensed	✓
Periodic	✓	Arguing revision		If so, number	3
Occasionally		Being revised	✓	Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	
Purpose		Conservation		Probabilistic/Determ	
Regulation	✓	PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	
Planning		Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment		Mathematical	✓	PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical	✓	UNIX/Mainframe	✓
		Physical	✓		
Timescale		Biological	✓	**In-House**	
Resolution		Radioactivity		**Third Party**	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: EQS, Estuary Standards

Databases:

6. Comments

HR Wallingford software - used for stratified estuaries eg Tees, Tyne.

Contact: Julia Jarvis

Location: Leeds

Tel: 728 4673

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Aggregated Dead Zone

Form Ref: WQ009

2. Model Purpose

Acronym: ADZ

Assessing the time of arrival of a polluting discharge during an incident.

Users: North East, Thames? Anglian?

Frequency

Routine	
Periodic	✓
Occasionally	

Development

None	
Arguing revision	
Being revised	✓
Under development	

License

Licensed	✓
If so, number	3
Free	

3. General Assessment

Media

Air	
Land	
Water	✓
Waste	

Purpose

Regulation	
Operational	✓
Planning	✓
Prioritising	

Function

Water Quality	✓
Water Resources	
Flood Defence	
Fisheries	
Rec & Nav	
Conservation	
PIR	
Radioactivity	
Waste Policy	
Land Quality	

Risk Assessment

Qualitative	
Semi-Quantitative	
Quantitative	✓
Criteria	
Assessment	
Deterministic	✓
Stochastic	
Risk Assessment	✓
Risk Management	✓

4. Further Assessment

Coverage

Site Specific	✓
Catchment	✓
Regional	
National	
Timescale	
Resolution	

Type

Procedural	
Mathematical	✓
Statistical	
Chemical	✓
Physical	✓
Biological	
Radioactivity	

System Base

Paper	
PC - DOS	
PC - Windows	✓
UNIX/Mainframe	
In-House	
Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

6. Comments

ADZ refers to both a specific software package, and to a more generic methodology. Time of travel during incidents is done by a variety of methods depending on the amount of data available in a catchment. It is often done manually.

Contact: Richard Freestone

Location: Leeds

Tel: 728 4671

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: POLLUX

Form Ref: WQ010

2. Model Purpose

Acronym: POLLUX

Users: North East, (via Lyonnaise des Eaux)

Frequency

Routine	
Periodic	✓
Occasionally	

Development

None	
Arguing revision	✓
Being revised	
Under development	

License

Licensed	✓
If so, number	
Free	

3. General Assessment

Media

Air	
Land	
Water	
Waste	✓

Purpose

Regulation	
Operational	✓
Planning	
Prioritising	

Function

Water Quality	
Water Resources	
Flood Defence	
Fisheries	
Rec & Nav	
Conservation	
PIR	
Radioactivity	
Waste Policy	
Land Quality	

Risk Assessment

Qualitative	
Semi-Quantitative	
Quantitative	
Criteria	
Assessment	
Probabilistic/Determ	
Stochastic	
Risk Assessment	
Risk Management	

4. Further Assessment

Coverage

Site Specific	
Catchment	
Regional	
National	
Timescale	
Resolution	

Type

Procedural	
Mathematical	
Statistical	
Chemical	
Physical	
Biological	
Radioactivity	

System Base

Paper	
PC - DOS	
PC - Windows	
UNIX/Mainframe	
In-House	
Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

6. Comments

Under discussion, currently not validated

Contact: Trevor Hardy

Location: Leeds

Tel: 728 4676

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Construction of Bunds for Oil Storage

Form Ref: WQ011

2. Model Purpose

Acronym:

To define cost effective storage protection facilities to reduce the risk of (oil) pollution of controlled waters.

Users: Agency EPOS, Structural Engineers, Construction companies & oil industry.

Frequency		Development		License	
Routine		None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised		Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	✓
Water		Flood Defence		Quantitative	
Waste	✓	Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	
Regulation		PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	
Planning		Waste Policy		Risk Management	✓
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment		Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		In-House	✓
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases: None

6. Comments

R&D Project managed by CIRIA undertaken by AOAs

Contact: Teresa Brown

Location: Peterborough

Tel: 750 4121

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Farm Activity and River Management System

Form Ref: WQ012

2. Model Purpose

Acronym: FARMS I&II

FARMS I & II is a distributed catchment scale model to simulate the run-off of water and the transport of pollutants arising from farm wastes, into rivers. It is used for developing farm waste management plans.

Users:

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land	✓	Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Determinisitic	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy	✓	Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional	✓	Statistical		PC - Windows	
National	✓	Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale	Weeks	Biological	✓	In-House	✓
Resolution	Field	Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: EQSs and River Quality Objectives

Databases: Dependent on a cost database for information on disposal options.

6. Comments

FARMS has been tested on the Cleddau catchement in South West Wales and is now available for wider use within the NRA. The software was developed by WRc.

Contact: Paul Mitchell

Location: Exeter

Tel: 724 4757

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Simulation of Catchments

Form Ref: WQ013

2. Model Purpose

Acronym: SIMCAT

Stochastic modelling of water quality in catchments. It is used as a consent setting tool.

Users: Anglian, Thames, North West, West Midlands, Southern, South West.

Frequency		Development		License	
Routine	✓	None		Licensed	
Periodic		Arguing revision		If so, number: 4	
Occasionally		Being revised	✓	Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	
Purpose		Conservation		Deterministic	
Regulation		PIR	✓	Stochastic	✓
Operational		Radioactivity		Risk Assessment	
Planning		Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical		PC -Windows 95/DOS	✓
Regional		Statistical	✓	PC - Windows	
National		Chemical	✓	UNIX/Mainframe	
		Physical			
Timescale	min3, max5	Biological		In-House	✓
Resolution	100 m	Radioactivity		Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: River standards (expressed as mean and percentiles) & site specific targets.

Databases: SIMCAT relies on river specific data files for flow and quality data and also uses data from WQ archives.

6. Comments

SIMCAT is auto-calibrating and very quick to set up. It automatically calculates the statistical confidence limits for each result + the consents required to meet River Quality Standards.

Contact: Tony Warn

Location: Peterborough

Tel: 750 4235

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title Temporal Overall Model for Catchments — **Form Ref** WQ014

2. Model Purpose — **Acronym** TOMCAT

Stochastic modelling of water quality in catchments. It may be used as a tool for consent setting in order to achieve river quality standards and may also be used as a planning tool to model, for example, phosphate to assist targeting investment.

Users: North East, Thames, Southern

Frequency		Development		License	
Routine	✓	None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised	✓	Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Deterministic	✓
Regulation	✓	PIR	✓	Stochastic	✓
Operational		Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical	✓	PC - Windows	
National		Chemical	✓	UNIX/Mainframe	
	✓	Physical	✓		
Timescale	min 1 yr, max 3 yr	Biological		**In-House**	✓
Resolution	500 m reaches	Radioactivity		**Third Party**	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards — Databases

6. Comments

Contact: Richard Freestone — Location: Leeds — Tel: 728 4671

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Incident Reaction Interface System

Form Ref: WQ015

2. Model Purpose

Acronym: IRIS

IRIS is a time of travel calculation model for assessing the length of time taken for a pollutant to travel down a catchment to potable water intakes. The models primary function is for intake protection purposes.

Users: Field staff modellers & water companies.

Frequency		Development		License	
Routine		None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised		Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Deterministic	✓
Regulation		PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural	✓	Paper	
Catchment		Mathematical	✓	PC - DOS	
Regional	✓	Statistical		PC - Windows	✓
National		Chemical		UNIX/Mainframe	
		Physical			
Timescale	Unit(s)/Scale (& seconds	Biological		In-House	✓
Resolution	1km reaches	Radioactivity		Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases: Lotus Spreadsheet containing time of travel raw data. Linked to ADZ.

6. Comments

Contact: Fred Simpson

Location: Reading

Tel: 725 5429

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Pollution Prevention Manual

Form Ref: WQ016

2. Model Purpose

Acronym:

To provide consistant guidance to all Environment Agency field officers on pollution prevention issues including site visits, risk assessment and risk management.

Users: Area EP staff, Regional and Head Office Staff

Frequency

Routine	✓
Periodic	
Occasionally	

Development

None	
Arguing revision	
Being revised	✓
Under development	

License

Licensed	
If so, number	
Free	

3. General Assessment

Media

Air	
Land	
Water	✓
Waste	✓

Purpose

Regulation	
Operational	
Planning	
Prioritising	

Function

Water Quality	✓
Water Resources	
Flood Defence	
Fisheries	
Rec & Nav	
Conservation	
PIR	
Radioactivity	
Waste Policy	
Land Quality	

Risk Assessment

Qualitative	
Semi-Quantitative	
Quantitative	
Criteria	
Assessment	
Probabilistic/Determ	
Stochastic	
Risk Assessment	
Risk Management	

4. Further Assessment

Coverage

Site Specific	
Catchment	
Regional	✓
National	✓

Timescale	
Resolution	

Type

Procedural	✓
Mathematical	
Statistical	
Chemical	✓
Physical	✓
Biological	
Radioactivity	

System Base

Paper	✓
PC - DOS	
PC - Windows	
UNIX/Mainframe	

In-House	✓
Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

6. Comments

Where appropriate Wastes Regulatory/Disposal issues are addressed in any new or revised guidance that goes into the manual.

Contact: D. Griffiths

Location: Rio House

Tel: 710 4520

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Pollution Prevention Site Visits

Form Ref: WQ017

2. Model Purpose

Acronym:

To assess and manage risk on wide ranging types of site to prevent pollution and improve water quality. All regions undertake some form of PP activity.

Users: Area EP Staff

Frequency		Development		License	
Routine	✓	None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	✓
Land		Water Resources		Semi-Quantitative	✓
Water	✓	Flood Defence		Quantitative	
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	
Purpose		Conservation		Deterministic	✓
Regulation	✓	PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	✓
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment	✓	Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		In-House	✓
Resolution		Radioactivity		Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases: PP site database under development/roll out to regions.

6. Comments

Strong move towards making site visits cross-functional wherever possible. The number of site visits for preventing water pollution has decreased markedly of late because of insufficient resource.

Contact: D. Griffiths

Location: Bristol

Tel: 710 4520

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Works Notice Risk Assessment Forms

Form Ref: WQ018

2. Model Purpose

Acronym:

To provide a consistent basis for deciding whether a works notice should be served to prevent water pollution.

Users: Area EP Staff

Frequency

- Routine
- Periodic
- Occasionally

Development

- None
- Arguing revision
- Being revised
- Under development

License

- Licensed
- If so, number
- Free

3. General Assessment

Media

- Air
- Land
- Water
- Waste

Purpose

- Regulation
- Operational
- Planning
- Prioritising

Function

- Water Quality
- Water Resources
- Flood Defence
- Fisheries
- Rec & Nav
- Conservation
- PIR
- Radioactivity
- Waste Policy
- Land Quality

Risk Assessment

- Qualitative
- Semi-Quantitative
- Quantitative
- Criteria
- Assessment
- Probabilistic/Determ
- Stochastic
- Risk Assessment
- Risk Management

4. Further Assessment

Coverage

- Site Specific
- Catchment
- Regional
- National

- Timescale
- Resolution

Type

- Procedural
- Mathematical
- Statistical
- Chemical
- Physical
- Biological
- Radioactivity

System Base

- Paper
- PC - DOS
- PC - Windows
- UNIX/Mainframe

- In-House
- Third Party

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases: Provision made within new ground water regulations database.

6. Comments

Since April 1999 The Environment Agency has been able to serve Works Notices to prevent pollution. The Risk Assessment form within the guidance provides the basis for doing this consistently.

Contact: D. Griffiths

Location: Bristol

Tel: 710 4520

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Prediction of Pesticide Pollution in the Environment.

Form Ref: WQ019

2. Model Purpose

Acronym: POPPIE

Prediction of Pesticide Pollution in the Environment.

Users: To be implemented in Regions and National Centres. This model is for Agency use only.

Frequency		Development		License	
Routine		None		Licensed	
Periodic	✓	Arguing revision		If so, number	
Occasionally		Being revised	✓	Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	✓
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	
Purpose		Conservation		Probabilistic/Determ	
Regulation	✓	PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional	✓	Statistical	✓	PC - Windows	✓
National	✓	Chemical	✓	UNIX/Mainframe	✓
		Physical	✓		
Timescale	Few days-annual	Biological		In-House	
Resolution	10 km 2	Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: EQSs and Drinking Water Standards

Databases: Many/GIS Layers

6. Comments

Contact: Andy Croxford

Location: Wallingford

Tel: 750 8534

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: FARM Pollution Prevention Visit Proforma

Form Ref: WQ020

2. Model Purpose

Acronym:

Consistent data collection on farm storage facilities and risk assessment of storage operations.

Users: Area EP Staff

Frequency		Development		License	
Routine	✓	None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	✓
Land		Water Resources		Semi-Quantitative	✓
Water	✓	Flood Defence		Quantitative	
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	✓
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment	✓	Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		**In-House**	✓
Resolution		Radioactivity		**Third Party**	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases: NVZ database transferred from MAFF.

6. Comments

Generally farm visits have reduced significantly in recent years but Environment Agency has new responsibilities under the Nitrate Directive to visit farms in NVZs to ensure compliance.

Contact: D. Griffiths

Location: Bristol

Tel: 710 4520

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Pollution Risk from Accidental Influx to Rivers & Estuaries

Form Ref: WQ021

2. Model Purpose

Acronym: PRAIRIE

To predict consequences of accidental releases of chemicals into water courses.

Users: Environment Protection & Pollution Prevention Staff

Frequency		Development		License	
Routine	*	None	✓	Licensed	✓
Periodic		Arguing revision		If so, number	20
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	✓
Water		Flood Defence		Quantitative	
Waste	✓	Fisheries		Criteria	
		Rec & Nav		Assessment	
Purpose		Conservation		Deterministic	✓
Regulation	✓	PIR		Stochastic	✓
Operational		Radioactivity		Risk Assessment	
Planning		Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional		Statistical		PC - Windows	✓
National		Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale		Biological	✓	In-House	
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Contains toxicity information

Databases: Integral

6. Comments

Developed to support Dee Protection Zone.
* Frequency of use varies between regions and areas.

Contact: S. Halfacree

Location: Cardiff

Tel: 726 2093

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Urban Pollution Management Manual — Form Ref: WQ022

2. Model Purpose — Acronym: UPM Manual

The UPM Manual is designed to deliver adequate environmental protection at least cost for intermittent discharges of urban sewage. This is achieved through the planning process and the use of specific tools developed for the purpose.

Users:

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	✓
Land		Water Resources		Semi-Quantitative	✓
Water	✓	Flood Defence		Quantitative	✓ ✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR		Stochastic	✓
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	✓
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment		Mathematical	✓	PC - DOS	✓
Regional		Statistical	✓	PC - Windows	✓
National	✓	Chemical	✓	UNIX/Mainframe	✓
		Physical	✓		
Timescale		Biological		**In-House**	✓
Resolution		Radioactivity		**Third Party**	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Intermittent Standards and UPM, EQSs, RE Classification.

Databases: Specific to application.

6. Comments

Contact: Trevor Hardy — Location: Leeds — Tel: 728 4676

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Decision Support Tool

Form Ref: WQ023

2. Model Purpose

Acronym: DECIST

Make better decisions when deciding levels of data collection in urban pollution management studies.

Users: Water Quality Planners

Frequency

Routine	
Periodic	✓
Occasionally	

Development

None	✓
Arguing revision	
Being revised	
Under development	

License

Licensed	
If so, number	
Free	✓

3. General Assessment

Media

Air	
Land	
Water	✓
Waste	

Purpose

Regulation	✓
Operational	✓
Planning	
Prioritising	

Function

Water Quality	✓
Water Resources	
Flood Defence	
Fisheries	
Rec & Nav	
Conservation	
PIR	
Radioactivity	
Waste Policy	
Land Quality	

Risk Assessment

Qualitative	
Semi-Quantitative	
Quantitative	✓
Criteria	
Assessment	
Probabilistic/Determ	✓
Stochastic	✓
Risk Assessment	✓
Risk Management	

4. Further Assessment

Coverage

Site Specific	
Catchment	✓
Regional	
National	

Timescale	2 monthly
Resolution	

Type

Procedural	✓
Mathematical	✓
Statistical	✓
Chemical	✓
Physical	
Biological	
Radioactivity	

System Base

Paper	
PC - DOS	
PC - Windows	✓
UNIX/Mainframe	

In-House	
Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Water Quality Intermittent (UPM)

Databases:

6. Comments

Likely to be used in only 2 or 3 regions (North West & Severn Trent)

Contact: Trevor Hardy

Location: Leeds

Tel: 728 4676

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Catchment Inventory System

Form Ref: WQ024

2. Model Purpose

Acronym: CATCHIS

CATCHIS is a system for evaluating the risk of specific pesticides being present in specified surface water and groundwater locations.

Users:

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land	✓	Water Resources	✓	Semi-Quantitative	✓
Water	✓	Flood Defence		Quantitative	
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical	✓	UNIX/Mainframe	✓
		Physical	✓		
Timescale		Biological		In-House	
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases: Dependent on SSLRC database on soil characteriactics and on pesticide information.

6. Comments

CATCHIS has been developed by SSLRC with Severn Trent Water Plc.

Contact: Jonathan Smith

Location: NGWCLC

Tel: 722 4753

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Source Protection Zones models & maps

Form Ref: WQ025

Acronym: SPZs

2. Model Purpose

Source Protection Zones have been developed to define areas in which activities could impact groundwater abstraction.

Users: Regions + Areas.

Frequency		Development		License	
Routine	✓	None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land	✓	Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	✓
		Rec & Nav		Assessment	
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	IPC		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	
Planning	✓	Waste Disposal	✓	Risk Management	✓
Prioritising	✓	Cont. Land	✓		

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	✓
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical		PC - Windows	✓
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale	30 days+ 400days +	Biological		**In-House**	✓
Resolution	1. 25,000	Radioactivity		**Third Party**	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Links to Groundwater Protection Policy

Databases: Data & maps held in regional offices and national digital databases also available.

6. Comments

Each site has a Source Evaluation Report which is the paper copy of all the data collected in definition of the zone. Maps are available from the public register.

Contact: Steve Fletcher

Location: NGWCLC

Tel: 722 4663

Environment Agency
Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title Groundwater Vulnerability Maps

Form Ref WQ026

Acronym

2. Model Purpose

Groundwater Vulnerability Maps have been produced to define the vulnerability of groundwater in any specific location regardless of use.

Users:

3. Additional Information

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land	✓	Water Resources	✓	Semi-Quantitative	✓
Water	✓	Flood Defence		Quantitative	
Waste		Fisheries		Criteria	✓
		Rec & Nav		Assessment	
Purpose		Conservation		Probabilistic/Determ	
Regulation	✓	IPC		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Disposal		Risk Management	✓
Prioritising	✓	Cont. Land			

5. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural	✓	Paper	✓
Catchment	✓	Mathematical		PC - DOS	
Regional	✓	Statistical		PC - Windows	✓
National	✓	Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		In-House	✓
Resolution	1:100 000	Radioactivity		Third Party	

6. Links to Standards, Targets and Databases (Cross-reference)

Standards

Databases: Production of Maps relies on SSLRC and BGS databases. The maps are available in digital form.

7. Comments

Contact: Rob Word Location: NGWCLC Tel: 0121 711 5841

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Rapid Risk Assessment Methodology

Form Ref: WQ027

2. Model Purpose

Acronym:

To provide consistent approach to risk assessment at industrial sites (non IPC sites).

Users: Environment Planning and Protection Officers

3. Additional Information

Frequency		Development		License	
Routine		None	✓	Licensed	
Periodic	✓	Arguing revision		If so, number	
Occasionally		Being revised	✓	Free	✓
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	✓
Water	✓	Flood Defence		Quantitative	
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	✓
Prioritising	✓	Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural	✓	Paper	✓
Catchment	✓	Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical	✓	UNIX/Mainframe	
		Physical			
Timescale		Biological		**In-House**	✓
Resolution		Radioactivity		**Third Party**	

6. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

7. Comments

Pollution Prevention Manual, Vol 026, Part 1, Chapter 6
Version 1.2, 10/97

Contact: Graham Tate

Location: LEEDS

Tel: 728 4677

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Discharge Consent Manual

Form Ref: WQ028

2. Model Purpose

Acronym:

The Discharge Consent Manual is a collection of Agency's policies for the determination of Consents for discharges. The Manual covers the legal & technical basics for ensuring the protection of WQ. The manual is a dynamic document subject to continual reviews & addition.

Users: Regional Area Consenting teams
External Dischargers

3. Additional Information

Frequency		Development		License	
Routine	✓	None		Licensed	
Periodic		Arguing revision	✓	If so, number	
Occasionally		Being revised		Free	
		Under development		It is a controlled Document	

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	✓
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR		Stochastic	✓
Operational	✓	Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	✓
Prioritising		Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment		Mathematical	✓	PC - DOS	✓
Regional		Statistical	✓	PC - Windows	✓
National		Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale		Biological	✓	**In-House**	✓
Resolution		Radioactivity		**Third Party**	

6. Links to Standards, Targets and Databases (Cross-reference)

Standards: EQSs, EC Directives, Water Quality Objectives, RR classification

Databases: Water Quality Archive
Charging for discharges

7. Comments

Risk assessment is not intrinsic within the Manual, however, consents themselves are used to manage the risk associated with discharges. Risk Assessment is implicit within Consent Determination. The Manual covers policy, procedures, charging affluents , standard consents, technical guidance, monitoring, compliance & exporting, registers & IPC.

Contact: Chris Chubb

Location: E.A WQ Bristol

Tel: 710 4314

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: LandSim

Form Ref: WP001

2. Model Purpose

Acronym: LandSim

LandSim allows the assessor to predict the impact of pollutants in a landfill site on the quality of controlled waters (particularly groundwater). The model considers leachate chemistry, engineering performance of containment and leachate collection systems and processes acting in the insaturated zone to attenuate pollutants before they reach the waterhole.

Users: Waste and Groundwater staff (technical support), consultants and Industry

3. Additional Information

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised	✓	Free	✓
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste	✓	Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	
Regulation	✓	PIR		Stochastic	✓
Operational		Radioactivity		Risk Assessment	✓
Planning		Waste Policy	✓	Risk Management	
Prioritising	✓	Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment		Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical			
Timescale		Biological		In-House	
Resolution		Radioactivity		Third Party	

6. Links to Standards, Targets and Databases (Cross-reference)

Standards: Water Quality Critieria, Waste Management Operational Practice (eg head of leachate)

Databases: N/A

7. Comments

Agency owned tool. It is for use at both the planning stage in support of a Waste Management License (Reg 15 Assessment), but is only one of a number of tools that may be adopted.

Contact: Jonathan Smith

Location: Solihull

Tel: 722 4753

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. **Title** OPRA FOR WASTE
Operator and Pollution Risk Appraisal for Waste.

Form Ref WP002

2. **Model Purpose**

Acronym OPRA for Waste

OPRA for Waste provides a straightforward characterisation of the overall environmental risk from waste disposal or recovery operations by providing an indication of an occurrence of an undesirable event and the consequences of the event. These factors are combined to give an indication of comparative risks and are used to determine the frequency of inspections at sites.

Users: Environment Protection Officers

3. **Additional Information**

Frequency		**Development**		**License**	
Routine	✓	None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised as part of DETR consultation	✓	Free	✓
		Under development			

4. **General Assessment**

Media		**Function**		**Risk Assessment**	
Air		Water Quality		Qualitative	
Land		Water Resources		Semi-Quantitative	✓
Water		Flood Defence		Quantitative	
Waste	✓	Fisheries		Criteria	✓
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	
Regulation	✓	PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy	✓	Risk Management	
Prioritising	✓	Land Quality			

Prioritisation system for licence review

On site work

Planned

Inspection Methodology

Site specific basis but could give risk mgmt output in terms of Agency visits & operator controls highlighted.

5. **Further Assessment**

Coverage		**Type**		**System Base**	
Site Specific	✓	Procedural		Paper	✓
Catchment		Mathematical	✓	PC - DOS	
Regional		Statistical		PC Windows REGIS	✓
National	✓	Chemical		UNIX/Mainframe	
		Physical			
Timescale		Biological		In-House	✓
Resolution		Radioactivity		Third Party	

Contains procedural elements in inspection methodology

6. **Links to Standards, Targets and Databases (Cross-reference)**

Standards: Ongoing Assessment

Databases: REGIS

7. **Comments**

Contact: M. Harget

Location: SW - Regional Waste

Tel: 724 2568

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Flood Defence Management System — Form Ref: FD001

2. Model Purpose — Acronym: FDMS

The main purpose is to identify the need for capital/revenue expenditure and to determine the priorisation and justification of that expenditure.

Users: All Regions

Frequency		Development		License	
Routine	✓	None		Licensed	?
Periodic		Arguing revision		If so, number	
Occasionally		Being revised	✓	Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land	✓	Water Resources		Semi-Quantitative	✓
Water	✓	Flood Defence	✓	Quantitative	
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	
Regulation		PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	✓
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural	✓	Paper	✓
Catchment		Mathematical		PC - DOS	
Regional	✓	Statistical		PC - Windows	✓
National		Chemical		UNIX/Mainframe	✓
		Physical			
Timescale		Biological		In-House	✓
Resolution		Radioactivity		Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Standards of Services, National Standard for Prioritisation, FDMM

Databases:

6. Comments

Developed in-house. Has a GIS front end..

Contact: Brian Empson — Location: Bristol — Tel: 710 4378

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Frequency Simulation (of Flood Flows)

Form Ref: FD004

2. Model Purpose

Acronym: FRQSIM

FSR is used for estimation of design flows for ungauged catchments. Flows are estimated at one point in the catchment only.

Users: At present it is mainly used within Thames Region.

Frequency		Development		License	
Routine		None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical	✓	PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale	5-72 hrs	Biological		In-House	✓
Resolution		Radioactivity		Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Standards of Service

Databases:

6. Comments

FRQSIM was originally developed by the GLC and has since been extensively modified.

Contact: David Rylands

Location: Reading

Tel: 725 5752

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Rainfall Run-off (on Burrows Computer)

Form Ref: FD005

2. Model Purpose

Acronym: RORB

RORB is used for estimation of design flows on catchments with some gauging.

Users:

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical	✓	PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		In-House	
Resolution		Radioactivity		Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Standards of Service

Databases: River flow data

6. Comments

RORB is an Australian developed model (Hydrologica are the UK agents) FRQSIM or RIBAMAN tend to be used preference.

Contact: David Rylands

Location: Reading

Tel: 725 5752

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Regional Flow-Forecasting System

Form Ref: FD006

2. Model Purpose

Acronym:

The Regional Flow-Forecasting System relies on output from one of three models (Isolated Event Model/Thames Conceptual Model/Probability Model) to forecast flood events in river catchment zones.

Users:

Frequency

Routine	
Periodic	
Occasionally	

Development

None	
Arguing revision	
Being revised	
Under development	

License

Licensed	
If so, number	
Free	

3. General Assessment

Media

Air	
Land	
Water	✓
Waste	

Purpose

Regulation	
Operational	✓
Planning	
Prioritising	

Function

Water Quality	
Water Resources	
Flood Defence	✓
Fisheries	
Rec & Nav	
Conservation	
PIR	
Radioactivity	
Waste Policy	
Land Quality	

Risk Assessment

Qualitative	
Semi-Quantitative	
Quantitative	✓
Criteria	
Assessment	✓
Probabilistic/Determ	✓
Stochastic	
Risk Assessment	✓
Risk Management	

4. Further Assessment

Coverage

Site Specific	✓
Catchment	✓
Regional	
National	

Timescale	15m to 12h ahead
Resolution	2km grid

Type

Procedural	
Mathematical	✓
Statistical	
Chemical	
Physical	✓
Biological	
Radioactivity	

System Base

Paper	
PC - DOS	
PC - Windows	
UNIX/Mainframe	✓
In-House	
Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases: Relies on output from Isolated Even Model/ Thames Catchment Model/

6. Comments

Contact: Chris Hagett

Location: Waltham Cross

Tel: 725 5440

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: ISIS

Form Ref: FD007

2. Model Purpose

Acronym: ISIS

ISIS has been developed from ONDA and SALMON and it models flow, water quality and sediment transport in complex river and channel networks.

Users: Flood Defence and Water Quality staff.

Frequency		Development		License	
Routine	✓	None		Licensed	✓
Periodic		Arguing revision		If so, number	10
Occasionally	✓	Being revised	✓	Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav.		Assessment	✓
Purpose		Conservation		Probabilistic/Deter	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional		Statistical		PC - Windows	✓
National		Chemical	✓	UNIX/Mainframe	✓
		Physical	✓		
Timescale	Up to 24 hours	Biological	✓	In-House	✓
Resolution	<1m	Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

6. Comments

ISIS supersedes ONDA, SALMON and various other models. It is used routinely by flood defence for model flow and design and occasionally by water quality staff.

Contact: David Rylands

Location: Reading

Tel: 725 5752

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. **Title** Hydrological Engineering Centre 2 — **Form Ref** FD008

2. **Model Purpose** — **Acronym** HEC 2

HEC 2 is a backwater model for ascertaining water levels along a reach of river or open channel for a steady flow rate.

Users:

Frequency		**Development**		**License**	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. **General Assessment**

Media		**Function**		**Risk Assessment**	
Air		Water Quality		Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising		Land Quality			

4. **Further Assessment**

Coverage		**Type**		**System Base**	
Site Specific	✓	Procedural		Paper	
Catchment		Mathematical	✓	PC - DOS	✓
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale	Steady state	Biological		In-House	
Resolution	50-200mm	Radioactivity		Third Party	✓

5. **Links to Standards, Targets and Databases (Cross-reference)**

Standards — **Databases**

6. **Comments**

HEC 2 was developed originally by the US Corps of Engineers and could be used more formally in risk assessmen although it is not used this way at present.

Contact Lynda Aucott — Location: Exeter — Tel: 724 2394

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Backwater Programs (Generic)

Form Ref: FD009

2. Model Purpose

Acronym:

Backwater programs are used to estimate water levels given in-channel geometry and roughness and a steady flow.

Users: All Regions

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		In-House	✓
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Standards of Service

Databases:

6. Comments

Backwater programs are used in most Regions and exist in many different forms.

Contact: David Rylands

Location: Reading

Tel: 725 5752

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: MIKE - 2 Dimensional and 1 Layered

Form Ref: FD010

2. Model Purpose

Acronym: MIKE21

MIKE21 is a comprehensive modelling system for 2D free surface flows and is applicable to hydraulic and related phenomena in lakes, estuaries, bays and coastal areas.

Users:

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional	✓	Statistical	✓	PC - Windows	✓
National		Chemical	✓	UNIX/Mainframe	✓
		Physical	✓		
Timescale		Biological		In-House	
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

6. Comments

MIKE21 is a modular system which includes advection/dispersion, water quality, eutrophication, heavy metals, sedimen processes, and long/short wave modelling. Supported in the UK by WS Atkins.

Contact: David Rylands

Location: Reading

Tel: 725 5752

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: NAM (Hydrological Model) — Form Ref: FD011

2. Model Purpose — Acronym: NAM

NAM is a deterministic conceptual lumped model representing the land phase of the hydrological cycle. It is based on physical and semi empirical formulations.

Users:

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land	✓	Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional		Statistical	✓	PC - Windows	✓
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		In-House	
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: — Databases:

6. Comments

NAM includes snow storage, surface storage, lower zone storage, and groundwater storage. DHI software supported in the UK by WS Atkins.

Contact: David Rylands — Location: Reading — Tel: 725 5752

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title Forecasting Rain Optimised using New Techniques of Interactively Enhanced Radar and Satellite Data

Form Ref FD012

2. Model Purpose

Acronym FRONTIERS

FRONTIERS is a model that provides high-resolution quantitative rainfall forecasts for flow prediction.

Users:

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional	✓	Statistical		PC - Windows	
National	✓	Chemical		UNIX/Mainframe	✓
		Physical	✓		
Timescale	50m (up to 6 h ahead)	Biological		In-House	✓
Resolution	5km grid	Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards

Databases Dependent on radar data from Chenie radar.

6. Comments

System being developed further at present.

Contact Chris Hagett Location: Reading Tel: 725 5440

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Local Rainfall Forecasting System

Form Ref: FD013

2. Model Purpose

Acronym:

The Local Rainfall Forecasting System is an advection model that models the speed and direction of rainfall and can forecast up to two hours ahead.

Users:

Frequency

Routine	
Periodic	
Occasionally	

Development

None	
Arguing revision	
Being revised	
Under development	

License

Licensed	
If so, number	
Free	

3. General Assessment

Media

Air	
Land	
Water	✓
Waste	

Purpose

Regulation	
Operational	✓
Planning	
Prioritising	

Function

Water Quality	
Water Resources	
Flood Defence	✓
Fisheries	
Rec & Nav	
Conservation	
PIR	
Radioactivity	
Waste Policy	
Land Quality	

Risk Assessment

Qualitative	
Semi-Quantitative	
Quantitative	✓
Criteria	
Assessment	✓
Probabilistic/Determ	✓
Stochastic	
Risk Assessment	✓
Risk Management	

4. Further Assessment

Coverage

Site Specific	
Catchment	✓
Regional	✓
National	
Timescale	
Resolution	2km grid

Type

Procedural	
Mathematical	✓
Statistical	
Chemical	
Physical	✓
Biological	
Radioactivity	

System Base

Paper	
PC - DOS	
PC - Windows	
UNIX/Mainframe	✓
In-House	✓
Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases: Dependent on radar data from Chenies radar.

6. Comments

The Local Rainfall Radar System was originally developed by the Institute of Hydrology.

Contact: Chris Hagett

Location: Reading

Tel: 725 5440

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title Generating Advanced Non-Casts for Deployment in Operational Land-surface Flood-Forecasting

Form Ref FD014

2. Model Purpose

Acronym GANDALF

GANDALF is an operational thunderstorm warning procedure for use with river flood forecasting systems.

Users:

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	✓
		Physical	✓		
Timescale	5mins-15mins	Biological		In-House	✓
Resolution	2km grid	Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards

Databases

6. Comments

Contact Chris Hagett

Location: Reading

Tel: 725 5440

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Simple Practical Application of Collective Experience (Rapid Risk Assessment Methodology)

Form Ref: FD015

2. Model Purpose

Acronym: SPACE

SPACE is a technique for assessing risk to flood defences, including the risk of failure of such flood defences.

Users: Operational staff

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land	✓	Water Resources		Semi-Quantitative	✓
Water	✓	Flood Defence	✓	Quantitative	
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment	✓	Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		In-House	✓
Resolution		Radioactivity		Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Standards of Service

Databases: Completed questionnaires have been entered into a database.

6. Comments

Contact: Richard Logan

Location: Head Office

Tel: 0117 914 2610

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Risk Assessment for Sea and Tidal Defences

Form Ref: FD016

2. Model Purpose

Acronym:

This methodology has been developed to provide a detailed quantitative risk assessment procedure including probabilistic failure analysis and assessment of areas of flooding. This methodology is designed to compliment the Space Methodology and act as a second tier detailed assessment.

Users: Staff at NCRAOA

Frequency		Development		License	
Routine	✓	None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised	✓	Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land	✓	Water Resources		Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment	✓	Mathematical	✓	PC - DOS	
Regional		Statistical	✓	PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		In-House	✓
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Standards of Service

Databases:

6. Comments

Contact: John Cross

Location: Leeds

Tel: 728 2379

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Indicative Floodplain Maps

Form Ref: FD017

2. Model Purpose

Acronym: IFM

Show areas within which the Agency carries out flood defence function (coastal and fluvial) in accordance with Circular 30/92.

Users:

Frequency		Development		License	
Routine	✓	None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources		Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	
Purpose		Conservation		Probabilistic/Determ	
Regulation	✓	PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	
Planning	✓	Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment		Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	✓
National	✓	Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		In-House	✓
Resolution		Radioactivity		Third Party	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases: IoH Flooded Areas database.

6. Comments

Shaded indicative flood - prone areas shown on 1:10000 map scale.

Contact: Ian Meadowcroft

Location: NCRAOA

Tel: 710 6830

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Flood Estimation Handbook

Form Ref: FD020

2. Model Purpose

Acronym: FEH

FEH is used for estimation of design flows for ungauged sites. It is a development of the flood standing report.

Users:

Frequency		Development		License	
Routine	✓	None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment		Mathematical	✓	PC - DOS	
Regional		Statistical	✓	PC - Windows	✓
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		**In-House**	
Resolution		Radioactivity		**Third Party**	

5. Links to Standards, Targets and Databases (Cross-reference)

Standards: Standards of Service

Databases:

6. Comments

Contact: Ian Meadowcroft

Location: NCRAOA

Tel: 710 6830

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Database of Erosion Deposition and Flooding

Form Ref: FD021

2. Model Purpose

Acronym:

Database of 1500 reported flooding and erosion events in Britain from 1770 to present. Developed by DETR to inform planning guidance.

Users: I. Meadowcroft

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised	✓	Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	✓
Land	✓	Water Resources		Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	
Regulation		PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment		Mathematical		PC - DOS	✓
Regional		Statistical		PC - Windows	
National	✓	Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		In-House	
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

6. Comments

Information on location, course severity

Contact: I. Meadowcroft

Location: NCRAOA

Tel: 710 6830

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: River Habitat Survey

Form Ref: CO001

2. Model Purpose

Acronym: RHS

To determine river habitat quality in the context of river type and level of physical modification.

Users: Agency Conservation Staff: LEAPS planners, fisheries, flood defence, water resources, external environmental organisations.

3. Additional Information

Frequency		Development		License	
Routine	✓	None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised	✓	Free	✓
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land	✓	Water Resources	✓	Semi-Quantitative	✓
Water	✓	Flood Defence	✓	Quantitative	
Waste		Fisheries	✓	Criteria	✓
		Rec & Nav		Assessment	✓
Purpose		Conservation	✓	Probabilistic/Determ	
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment	✓	Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	✓
National	✓	Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological	✓	**In-House**	✓
Resolution		Radioactivity		**Third Party**	

6. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases: RHS database in Microsoft access.

7. Comments

A national database exists, as well as individual regional datasets. RHS is now available through IS. Further refinement will be made to the method. There is a RHS user group.

Contact: Marc Naura

Location: Warrington, NW

Tel: 721 2454

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: River Corridor Survey

Form Ref: CO002

2. Model Purpose

Acronym: RCS

To provide information on the plant communities and land use along watercourses.

Users: Conservation, flood defence, water resources and external environmental organisations.

3. Additional Information

Frequency		Development		License	
Routine	✓	None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	✓
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	✓
Land	✓	Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	
Purpose		Conservation	✓	Probabilistic/Determ	
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment	✓	Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical			
Timescale		Biological	✓	**In-House**	
Resolution		Radioactivity		**Third Party**	✓

6. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

7. Comments

Regional usage varies - Thames carry out RCS on a rolling programme basis across all catchments.

Contact: Fran Bayley

Location: Frimley

Tel: 725 4501

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Landscape Assessment

Form Ref: CO003

2. Model Purpose

Acronym:

To provide information on landscape character of river corridors.

Users: Conservation

3. Additional Information

Frequency		Development		License	
Routine		None	✓	Licensed	
Periodic	✓	Arguing revision		If so, number	
Occasionally		Being revised		Free	✓
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	✓
Land	✓	Water Resources		Semi-Quantitative	
Water	✓	Flood Defence	(✓)	Quantitative	
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	
Purpose		Conservation	✓	Probabilistic/Determ	
Regulation		PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment		Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological	✓	In-House	
Resolution		Radioactivity		Third Party	✓

6. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

7. Comments

Use of landscape assessment varies between regions. Thames probably commission the most.

Contact: Richard Copas

Location: Reading

Tel: 725 5565

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Habitats Directive Review — Form Ref: CO004

2. Model Purpose — Acronym:

To review all consents / activities affecting Habitats and Birds Directive sites.

Users: All functions and English Nature

3. Additional Information

Frequency		Development		License	
Routine	✓	None		Licensed	
Periodic		Arguing revision	✓	If so, number	
Occasionally		Being revised		Free	✓
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air	✓	Water Quality	✓	Qualitative	✓
Land	✓	Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	✓
Waste	✓	Fisheries	✓	Criteria	✓
		Rec & Nav	✓	Assessment	✓
Purpose		Conservation	✓	Probabilistic/Determ	
Regulation	✓	PIR	✓	Stochastic	
Operational		Radioactivity	✓	Risk Assessment	✓
Planning		Waste Policy	✓	Risk Management	
Prioritising		Land Quality	✓		

5. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural	✓	Paper	✓
Catchment		Mathematical		PC - DOS	
Regional		Statistical		PC - Windows	✓
National	✓	Chemical		UNIX/Mainframe	
		Physical			
Timescale		Biological		**In-House**	✓
Resolution		Radioactivity		**Third Party**	✓

6. Links to Standards, Targets and Databases (Cross-reference)

Standards: — Databases:

7. Comments

This is a national "must - do" to comply with European legislation.

Contact: Pam Nolan — Location: Homebased — Tel: 01925 652 798

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Planning applications screening process

Form Ref: CO005

2. Model Purpose

Acronym:

To prioritise planning applications for consultation with conservation staff.

Users: Conservation and planning staff

3. Additional Information

Frequency		Development		License	
Routine	✓	None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	✓
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air	✓	Water Quality	✓	Qualitative	✓
Land	✓	Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence	✓	Quantitative	
Waste	✓	Fisheries	✓	Criteria	
		Rec & Nav	✓	Assessment	
Purpose		Conservation	✓	Probabilistic/Determ	
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	
Planning	✓	Waste Policy	✓	Risk Management	✓
Prioritising	✓	Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural	✓	Paper	✓
Catchment		Mathematical		PC - DOS	
Regional	✓	Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical			
Timescale		Biological		**In-House**	
Resolution		Radioactivity		**Third Party**	

6. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

7. Comments

Other regions have similar systems, but some have no filter mechanism.

Contact: Alaster Driver

Location: Reading

Tel: 725 5563

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: FLOWPATH

Form Ref: WR001

2. Model Purpose

Acronym: FLOWPATH

FLOWPATH is a propriatory model which is applied in the determination of Groundwater Protection Zones. The model may also be applied in groundwater pollution incident investigation. It is a 2D steady state numerical groundwater flow model.

Users:

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land	✓	Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	✓
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	✓
Prioritising	✓	Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical		PC - Windows	✓
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale	Days - Months	Biological		In-House	✓
Resolution	<1km dep.on grid	Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

6. Comments

FLOWPATH was developed by Waterloo University, Canada. Input data is specific to application. Flowpath is the preferred model for the derivation of Groundwater Protection Zones.

Contact: Paul Hulme

Location: NGCLC

Tel: 722 4755

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title MODFLOW/MODPATH **Form Ref** WR002

2. Model Purpose **Acronym** MODFLOW

MODFLOW is a finite difference groundwater model for modelling time variant flow in anisotropic, heterogeneous, layered aquified systems.
These models are 2D/3D Steady State/Time Variant Groundwater flow and particle backing models.

Users: Regions

Frequency		Development		License	
Routine		None	✓	Licensed	✓
Periodic	✓	Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Env Quality	✓	Qualitative	
Land	✓	Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		IPC		Stochastic	✓
Operational	✓	Radioactivity		Risk Assessment	✓
Planning		Waste Disposal		Risk Management	✓
Prioritising		Cont. Land			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical		PC - Windows	✓
National		Chemical	✓	UNIX/Mainframe	
		Physical			
Timescale	Days - Decades	Biological		**In-House**	✓
Resolution	Down to <10m	Radioactivity		**Third Party**	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards | Databases

6. Comments

FLOWPATH is generally preferred over MODFLOW for derivation at Groundwater Protection Zones.

Contact: Paul Hulme **Location:** NGWCLC **Tel:** 722 4755

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: RESPLAN

Form Ref: WR003

2. Model Purpose

Acronym:

Least cost economic prioritisation of resource
Development scheduling / resource allocation modelling

Users: Nigel Hepworth / Clair Rigg

3. Additional Information

Frequency		Development		License	
Routine	✓	None	✓	Licensed	
Periodic	✓	Arguing revision		If so, number	
Occasionally		Being revised		Free	✓
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	
Regulation		PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	✓
Prioritising		Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment		Mathematical	✓	PC - DOS	
Regional	✓	Statistical		PC - Windows	✓
National		Chemical		UNIX/Mainframe	
		Physical			
Timescale		Biological		**In-House**	
Resolution		Radioactivity		**Third Party**	

6. Links to Standards, Targets and Databases (Cross-reference)

Standards: Water Resources
Plans and Strategies

Databases:

7. Comments

Contact: Clair Rigg

Location: Worthing

Tel: 710 2285

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Finite Difference Code

Form Ref: WR004

2. Model Purpose

Acronym: BU

BU is a finite difference groundwater model for modelling time/variant flow in anisotropic, heterogeneous, layered aquifer systems. These models are 2D/3D steady state/time variant groundwater flow and particle tracking method.

Users: Regions

Frequency		Development		License	
Routine		None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised		Free	✓
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land	✓	Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	✓
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical			
Timescale	Days to decades	Biological		In-House	
Resolution	Less than 50m	Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

6. Comments

Developed by Birmingham University

Contact: Paul Hulme

Location: NGWCLC

Tel: 722 4755

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title Integrated Catchment Management Model

Form Ref WR005

2. Model Purpose

Acronym ICMM

This is a finite difference groundwater model for modelling transient flow in anisotropic, heterogeneous layered aquifer systems.

Users: Regions

Frequency		Development		License	
Routine		None	✓	Licensed	✓
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	?	Qualitative	
Land	✓	Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	✓
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical		PC - Windows	
National		Chemical	?	UNIX/Mainframe	
		Physical			
Timescale	Days to decades	Biological		In-House	
Resolution	Down to less than 50m	Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards

Databases Associated database - incorporated into model code.

6. Comments

Mott MacDonald - Commercial Code

Contact Paul Hulme **Location:** NGWCLC **Tel:** 722 4755

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Single Layer Finite Difference Code

Form Ref: WR006

2. Model Purpose

Acronym: SLAY

This is a finite groundwater model for modelling transient flow in anisotropic, heterogeneous, single layered, aquifer systems.

Users: Regions

Frequency		Development		License	
Routine		None	✓	Licensed	✓
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land	✓	Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	✓
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	✓
		Physical			
Timescale	Days to decades	Biological		In-House	
Resolution	Down to 50m	Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

6. Comments

Developed by Birmingham University and Halcrow.

Contact: Paul Hulme

Location: NGWCLC

Tel: 722 4755

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: MIKE - System Hydrologique Europeane

Form Ref: WR007

2. Model Purpose

Acronym: MIKE SHE

MIKE SHE is a dynamic modelling tool for the analysis planning and management of water resources and environmental problems related to surface water and groundwater, in particular to assess potential impact of human activities.

Users: Regions

Frequency		Development		License	
Routine		None	✓	Licensed	✓
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised		Free	
		Under development			

3. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land	✓	Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	✓
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy	✓	Risk Management	
Prioritising		Land Quality			

4. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical	✓	PC - Windows	✓
National		Chemical	✓	UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		In-House	
Resolution		Radioactivity		Third Party	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards:

Databases:

6. Comments

Superseded by CONSIM

Contact: Paul Hulme

Location: NGWCLC

Tel: 722 4755

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. **Title** Well Head Protection Area

Form Ref WR008

Acronym WHPA

2. Model Purpose

The Well Head Protection Area Model is utilised for derivation of Groundwater Protection Zones. The model is a 2D steady state numerical groundwater flow model.

Users:

Frequency		**Development**		**License**	
Routine		None	✓	Licensed	
Periodic		Arguing revision		If so, number	
Occasionally	✓	Being revised		Free	
		Under development			

3. General Assessment

Media		**Function**		**Risk Assessment**	
Air		Env Quality	✓	Qualitative	
Land	✓	Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	IPC		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning		Waste Disposal		Risk Management	✓
Prioritising		Cont. Land			

4. Further Assessment

Coverage		**Type**		**System Base**	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale	Days - Months	Biological		**In-House**	✓
Resolution	Down to <1 m	Radioactivity		**Third Party**	✓

5. Links to Standards, Targets and Databases (Cross-reference)

Standards

Databases

6. Comments

Flowpath is generally preferred over WHPA which has developed by the US EPA.

Contact: Sarah Evers

Location: NGWCLC

Tel: 722 4703

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title Surface Water Abstraction Licensing Procedure

Form Ref WR009

2. Model Purpose

Acronym SWALP

The determination of surface water abstraction licence applications.

Users: Water Resources staff

3. Additional Information

Frequency		Development		License	
Routine		None		Licensed	
Periodic	✓	Arguing revision		If so, number	
Occasionally		Being revised	✓	Free	✓
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation	✓	PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	✓
Prioritising		Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural	✓	Paper	✓
Catchment	✓	Mathematical	✓	PC - DOS	
Regional		Statistical	✓	PC - Windows	
National		Chemical		UNIX/Mainframe	
		Physical			
Timescale		Biological	✓	In-House	✓
Resolution		Radioactivity		Third Party	

6. Links to Standards, Targets and Databases (Cross-reference)

Standards: Statute

Databases: Hydrolog, Nald

7. Comments

In process of review following government directions.

Contact: Ian Barker

Location: Wales

Tel: 726 2127

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Micro Low Flows V21 — Form Ref: WR009

2. Model Purpose — Acronym:

Used to estimate natural and artificially infiltrated flow statistics at ungauged river sites.

Users: Water Resources staff (hydrogeological) and Water Quality Staff.

3. Additional Information

Frequency		Development		License	
Routine		None		Licensed	
Periodic	✓	Arguing revision		If so, number	up to 20
Occasionally		Being revised		Free	
		Under development	✓		

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality	✓	Qualitative	
Land		Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning		Waste Policy		Risk Management	
Prioritising		Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	✓
Regional	✓	Statistical	✓	PC - Windows	v 30
National	✓	Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		**In-House**	
Resolution		Radioactivity		**Third Party**	✓

6. Links to Standards, Targets and Databases (Cross-reference)

Standards: — Databases: Rainfall, artificial infiltration and abstraction.

7. Comments

System developed by IM within 7 of the 8 Agency Regions. New version V31 due to be released. From June 2000 will be implemented nationally.

Contact: Robert Grew — Location: Exeter — Tel: 724 2072

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Water Resources Model

Form Ref: WR010

2. Model Purpose

Acronym: WRM

Water Resources Planning. WRM helps evaluate capability of existing and proposed WR Development toward meeting target levels of service for consumption given existing and forecast demands against known hydrologic performance.

Users:

3. Additional Information

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising		Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment		Mathematical	✓	PC - DOS	
Regional	✓	Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	✓
		Physical			
Timescale		Biological		In-House	✓
Resolution		Radioactivity		Third Party	

6. Links to Standards, Targets and Databases (Cross-reference)

Standards: DGI-IV

Databases: Regional hydrometry water demands and forecasts.

7. Comments

Contact: Dave Elford

Location: Reading

Tel: 725 5386

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title Thames Catchment Model River Flow Generation — **Form Ref** WR011

2. Model Purpose — **Acronym**

To generate sequences of possible future river flows for different rainfall scenarios used in conjunction with the Thames WR model (for reservoirs). River Flows + reservoirs = Drought Management Model.

Users:

3. Additional Information

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational		Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising		Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional		Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	✓
		Physical	✓		
Timescale		Biological		**In-House**	✓
Resolution		Radioactivity		**Third Party**	

6. Links to Standards, Targets and Databases (Cross-reference)

Standards — Databases: Daily rainfall and River Flow databases.

7. Comments

May be calibrated for any river site where real flow data is available.

Contact: Brian Greenfield — Location: Reading — Tel: 725 5320

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Drought Management System

Form Ref: WR012

2. Model Purpose

Acronym: DMS

Operational planning and management of water resources. Provides a broad assessment of risk of resource/supply failure given statistical likelihood of different rainfall scenarios given actual reservoir storage, and run off at that time.

Users:

3. Additional Information

Frequency		Development		License	
Routine		None		Licensed	
Periodic		Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising		Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural		Paper	
Catchment		Mathematical		PC - DOS	
Regional	✓	Statistical		PC - Windows	
National		Chemical		UNIX/Mainframe	✓
		Physical	✓		
Timescale		Biological		In-House	✓
Resolution		Radioactivity		Third Party	

6. Links to Standards, Targets and Databases (Cross-reference)

Standards: DG1-IV

Databases: Rainfall data

7. Comments

Contact: Dave Elford

Location: Reading

Tel: 725 5386

Environment Agency

Register of Risk Assessment Tools: Part 1 - Models and Procedures

1. Title: Bursts and Background Estimates — Form Ref: WR013

2. Model Purpose — Acronym: BABE

To estimate the level of leakage of water from distribution system.

Users: Water Resources Planning staff; National Water Analysts and Resources Planners

3. Additional Information

Frequency		Development		License	
Routine		None	✓	Licensed	✓
Periodic	✓	Arguing revision		If so, number	
Occasionally		Being revised		Free	
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	
Prioritising	✓	Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific		Procedural	✓	Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional	✓	Statistical	✓	PC - Windows	✓
National	✓	Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale		Biological		**In-House**	
Resolution		Radioactivity		**Third Party**	

6. Links to Standards, Targets and Databases (Cross-reference)

Standards: Applies principles of "Managing Leakage" Water Industry accepted standard

Databases: Supply/Infrastructure data customer base information

7. Comments

Set of 9 reports (WRC contractor) covering key areas of leakage assessment and management used to create the estimation software (ACCESS).

Contact: David Howarth — Location: NWDMC-Worthing — Tel: 723 2127

Environment Agency

Register of Risk Assessment Tools: Part I - Models and Procedures

1. Title: Demand Forecasting Model

Form Ref: WR014

2. Model Purpose

Acronym: DFM

To forecast public water supply demands for the future.

Users: National Water Analysts and Water Resources Planners
Regional Water Resources Planning staff

3. Additional Information

Frequency		Development		License	
Routine		None	✓	Licensed	
Periodic	✓	Arguing revision		If so, number	
Occasionally		Being revised		Free	✓
		Under development			

4. General Assessment

Media		Function		Risk Assessment	
Air		Water Quality		Qualitative	
Land		Water Resources	✓	Semi-Quantitative	
Water	✓	Flood Defence		Quantitative	✓
Waste		Fisheries		Criteria	
		Rec & Nav		Assessment	✓
Purpose		Conservation		Probabilistic/Determ	✓
Regulation		PIR		Stochastic	
Operational	✓	Radioactivity		Risk Assessment	✓
Planning	✓	Waste Policy		Risk Management	✓
Prioritising		Land Quality			

5. Further Assessment

Coverage		Type		System Base	
Site Specific	✓	Procedural		Paper	
Catchment	✓	Mathematical	✓	PC - DOS	
Regional	✓	Statistical	✓	PC - Windows	✓
National	✓	Chemical		UNIX/Mainframe	
		Physical	✓		
Timescale	Yearly	Biological		In-House	
Resolution		Radioactivity		Third Party	✓

6. Links to Standards, Targets and Databases (Cross-reference)

Standards: Water Industry Standard Method

Databases: Census data
Supply and demand data

7. Comments

Product of joint NRA/UKWIR R&D project. Contractor was NERA.

Contact: David Howarth

Location: NWDMC-Worthing

Tel: 723 2127