

**APPENDIX B**  
**RANKING AND SCORING SYSTEMS IDENTIFIED**

**Table B-1. Overview of Developers/Users, Purpose, and Approach for Evaluated Systems**

	<b>System Name</b> (in the absence of a system name, the title of the document is cited)	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
<u>System No.</u>				
1	TRI Environmental Indicators Methodology (2)	By Abt Associates Inc. for U.S. EPA, OPPT (Abt Assoc.,1992)	impact evaluation: "to devise a measure that reflects the impacts of chemical releases and transfers"	chemical-specific
2	ATSDR, "CERCLA Section 104 Third Priority List" (1,2,4)	By and for U.S. EPA OTS and ATSDR (ATSDR, 1992)	priority setting: "to prepare a prioritized list of at least 100 hazardous substances commonly found at NPL sites..." (4)	chemical-specific
3	Existing Chemicals of Environmental Relevance (6)	By and for Society of German Chemists, Beratergremium für Umweltrelevante Altstoffe (BUA) (Behret, 1989a Vol 1)	regulatory action: to select chemicals which should be considered in greater detail from an environmental standpoint	chemical-specific
4	Existing Chemicals of Environmental Relevance II, Selection Criteria and Second Priority List	By and for Society of German Chemists, Beratergremium für Umweltrelevante Altstoffe (BUA) (Behret, 1989b Vol 2)	regulatory action: to set priorities for additional substances and in an advisory function to the German Federal Govt in assessing existing chemicals	chemical-specific
5	Review of Region VII TRI Strategy (1)	By and for U.S. EPA Region VII (Bouchard, 1991)	priority setting: "to determine areas most in need of investigation for further enforcement, remediation, technical assistance or other purposes" (1)	chemical-specific

Table B-1, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited)	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
<u>System No.</u>				
6	Candidate Substance List for Bans or Phase-outs (6)	By and for Ontario Ministry of the Environment (Socha et al, 1992)	regulatory action: to establish an integrated approach for development and delivery of Ontario MOE's programs (6)	chemical-specific
7	Criteria Identifying High Risk Pollutants (4)	By and for U.S. EPA (BNA, 1991)	regulatory action: to identify high-risk chemicals to evaluate emission reductions under the CAA Amendments of 1990 (1)	chemical-specific
8	A Classification System for Hazardous Chemical Wastes (4)	By authors for general use by those who manage and dispose of hazardous waste (Crutcher & Parker, 1990)	"a relative ranking system for hazardous wastes". Also, "to assist managing and disposal of these substances" (4)	chemical-specific
9	CERCLA Hazard Ranking System (HRS) (1,2,4,9)	By and for U.S. EPA OSWER (EPA, 1990)	regulatory action: "as the means of selecting sites for the NPL" (4)	site ranking
10	Identifying Chemical Candidates for Sunsetting: George Washington University (2, 3)	By GWU and Pollution Probe of Toronto for IJC (Foran & Glenn, 1993)	regulatory action: to develop a mechanism for identifying, evaluating and classifying chemicals as candidates for Sunsetting in the Great Lakes Basin	chemical-specific

Table B-1, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited)	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
<u>System No.</u>				
11	Existing Chemicals: Systematic Data Collection and Handling for Priority Setting	By a Nordic Working Group for Nordic countries (Gjos et al., 1989)	priority setting: "to develop a systematic method for the selection of chemicals of potential hazard to human health or the environment"	chemical-specific
12	Substances and Preparations Dangerous for the Environment: A System for Classification, Labeling and Safety Data Sheets	By a Nordic Working Group for Nordic countries (Gustafsson & Ljung, 1990)	regulatory action: a proposed system for "classification, labelling, and safety data sheets for substances and preparations dangerous to the environment"	chemical-specific
13	Notes on Ranking Chemicals for Environmental Hazard (4)	By authors for general use (Halfon & Reggiani, 1986)	To rank hazardous chemicals (4)	chemical ranking
14	Application of the Hazard Ranking System to the Prioritization of Organic Compounds Identified at Hazardous Waste Remedial Action Sites (1)	By and for U.S.EPA OSWER (Hallstedt et al., 1986)	priority setting: "to target those chemicals that are of highest concern with respect to hazardous waste cleanup and the reduction of hazards to human health" (1)	chemical-specific
15	Modified Hazard Ranking System (mHRS); A Ranking System for Hazardous Waste Sites and with Mixed Radioactive and Hazardous Wastes (4)	By and for U.S. DOE (Hawley & Napier, 1985)	"to allow discrimination of the various radioisotopes that pollute the DOE facilities and to allow ranking of these sites with the HRS" (4)	site ranking (includes a method for scoring radionuclides)

Table B-1, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited)	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
<u>System No.</u>				
16	A Groundwater Pollution Priority System (GWPPS) (4)	By and for the State of New Jersey (Hutchinson & Hoffman, 1983)	priority setting: to rank sites polluting groundwater (4)	site ranking
17	The Great Lakes Water Quality Agreement (GLWQA) Annex 1, Lists 1,2,3 (6)	By and for International Joint Commission of the US and Canada, Binational Objectives Committee (IJC, 1989)	regulatory action: to identify substances 1) present and toxic in the Great Lakes; 2) for additional study; 3) for additional monitoring in the Great Lakes system (6)	chemical-specific
18	Chemical Scoring by a Rapid Screen of Hazard (RASH) Method	By authors for general use (Jones et al., 1987)	"to present a rapid screening of hazard method (RASH) for estimating the composite relative toxicological potency of hazardous substances"	chemical-specific
19	Systematic Approach for Environmental Hazard Ranking of New Chemicals	By authors for general use in the European Community (Klein et al., 1988)	regulatory action: "to assess the environmental hazard of new chemicals"	chemical-specific
20	WMS Scoring System (2,5,6,8)	by and for Netherlands Directorate General for Environmental Protection (Könemann & Visser, 1988; Timmer et al., 1988)	priority setting: to select chemicals for further study and for development of environmental/health protection policy (6)	chemical-specific
21	Benchmark Comparisons (4)	By authors for general use (Laskowski et al., 1982)	impact evaluation: "to rank pesticides and herbicides" (4)	chemical-specific

Table B-1, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited)	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
<u>System No.</u>				
22	Michigan Critical Materials Register (MCMR) (2,6,7)	by the State of Michigan for MI DNR (Michigan DNR, 1987)	regulatory action: to list chemicals of high environmental concern used, discharged or disposed of in Michigan (6)	chemical-specific
23	USEPA Unfinished Business Report: A Comparative Assessment of Environmental Problems (1)	By U.S. EPA for the EPA Administrator (Morgenstern et al., 1987)	priority setting: to rank prominent environmental problems by the risk each poses to society to prioritize the use of EPA resources (1)	issue ranking
24	Chemical Scoring System for Hazard and Exposure Identification (1,6) (based on #62)	By and for EPA OTS and ORNL (O'Bryan & Ross, 1988)	regulatory action: "to screen chemicals for further investigation for potential regulation under TSCA" (1)	chemical-specific
25	Effluent Monitoring Priority Pollutant List (EMPPL) (6)	By and for Environment Ontario (1987, 1988)	regulatory action: to develop chemical specific monitoring regulations under MISA (6)	chemical-specific
26	Coastal Hazardous Waste Site Review (4)	By and for NOAA (Beckvar & Harris, 1985)	priority setting: to rank uncontrolled hazardous waste sites that are a threat to the marine environment (4)	site ranking
27	Site Ranking System (SRS) for Chemical and Radioactive Waste (4)	By and for DOE/HAZWRAP (Rechard et al., 1988, 1991)	priority setting: ranking hazardous waste sites according to human health risks (4)	site ranking

Table B-1, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited)	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
<u>System No.</u>				
28	A Practical Method for Priority Selections and Risk Assessment Among Existing Chemicals (5)	By authors for the Italian government and general use (Sampaolo & Binetti, 1986, 1989)	priority setting: to assess intrinsic chemical dangers, identify data needs, used for priority assessment or risk assessment	chemical-specific
29	UT Chemical Ranking System (2)	by University of Tennessee for EPA RREL (Davis et al., 1993)	priority setting: to prioritize chemicals for safer substitutes evaluation	chemical-specific
30	A Manual for Evaluating Contamination Potential of Surface Impoundments (4)	By and for U.S. EPA (Silka & Swearingen, 1978)	priority setting: "to estimate relative groundwater contamination potential of waste-holding surface impoundments" (4)	site ranking
31	The EPS Enviro-Accounting Method	By Swedish Environmental Research Institute and the Federation of Swedish Industries for general use (Steen & Ryding, 1992)	impact evaluation: a tool for life cycle impact assessment of products	the exact approach is unclear, it includes some chemical-specific properties
32	Defense Priority Model (FY 1993 Version)	By Earth Technology Corp. and ERM Program Management Co. for U.S. Department of Defense ( DOD, 1991)	priority setting: "to establish priorities for remedial action" (4)	site ranking
33	Hazardous Air Pollutants: Proposed Regulations Governing Constructed, Reconstructed and Modified Major Sources	By and for U.S. EPA ( EPA, 1993b) (40 CFR 63)	regulatory action: identification of the relative human health hazards from air pollutants	chemical-specific

Table B-1, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited)	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
<u>System No.</u>				
34	Ranking System for Clean Water Act Section 307(a) List of Priority Pollutants (1)	By Battelle for U.S. EPA Criteria and Standards Division (Poston and Prohammer, 1985; Cornaby et al, 1986)	regulatory action: "to determine which chemicals should be added to or subtracted from the Priority Pollutant List" (1)	chemical-specific
35	CERCLA Section 102 Reportable Quantity Ranking Process (2,6,9)	By U.S. EPA and Environmental Monitoring and Services, Inc. for U.S. EPA (EMS, 1985; EPA, 1989c)	regulatory action: to adjust the RQs of hazardous substances designated in CERCLA sec 101(14) (6)	chemical-specific
36	The Source Category Ranking System (1)	By Radian Corporation for U.S. EPA Office of Air Quality Planning Standards, Chemicals & Petroleum Branch (Radian , 1990)	priority setting: "to rank sources of different emissions in order to prioritize air pollutant source categories" (1)	chemical-specific
37	Sax Toxicity Ratings (or Hazard Index)	(Sax & Lewis, 1989)	to briefly identify the level of toxicity or hazard of a material	chemical-specific
38	Examination of the Severity of Toxic Effects and Recommendations of a Systematic Approach to Rank Adverse Effects (1)	By Environ Corporation for U.S. EPA (Environ , 1986)	to differentiate and rank the noncancer effects of chemicals on humans (1)	severity ranking, specific for effects
39	Screening Procedure for Chemicals of Importance to the Office of Water (1)	By and for U.S. EPA Office of Water, Office of Health and Environmental Assessment (EPA, 1986)	priority setting: "to differentiate quickly and inexpensively between higher and lower risk chemicals... (1)	chemical-specific

Table B-1, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited)	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
<u>System No.</u>				
40	Measuring Air Quality: The New Pollutants Standards Index (1)	By and for U.S. EPA Office of Policy Analysis (U.S EPA, 1978)	an index to measure air quality based on potential acute human health effects of 5 major pollutants (1)	chemical-specific, used only for 5 major pollutants
41	Ranking the Relative Hazards of Industrial Discharges to POTWs and Surface Waters (1)	By Abt. Associates, Inc. for EPA Office of Policy Analysis (Abt Assoc., 1991)	priority setting: "to rank water bodies and POTWs reported in the TRI" It is used to rank facilities, counties and states. (1)	site ranking, includes chemical-specific scoring
42	Targeting Pollution Prevention Opportunities Using the 1988 TRI (1)	By ICF for U.S. EPA Office of Policy, Planning and Evaluation, Pollution Prevention Division (ICF, 1990)	"to rank chemicals and facilities based on total volume of a subset of TRI chemicals" Also used to rank industries (1)	site ranking, includes chemical-specific scoring
43	EPA Design for the Environment Program Use Cluster Scoring System (also called: Chemical Use Clusters Scoring Methodology) (2,3)	By and for U.S. EPA OPPT, Design for the Environment (EPA, 1993a)	priority setting: to improve the chemical screening process and be used to set priorities for risk reduction and pollution prevention	chemical-specific
44	Screening Methodology for Pollution Prevention Targeting (1)	By and for U.S. EPA Office of Toxic Substances (EPA, date unknown)	priority setting: a tool for targeting chemicals for pollution prevention (1)	chemical-specific
45	Toxic Chemical Release Inventory Risk Screening Guide (1)	By and for U.S. EPA Office of Toxic Substances (EPA, 1989a)	priority setting: "to explain both the meaning of TRI data and ways of interpreting the data" (1)	chemical-specific

Table B-1, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited)	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
	<u>System No.</u>			
46	TSCA's TRI Chemical Risk Assessment Pre-Screening Methodology (1)	By and for U.S. EPA Office of Toxic Substances (EPA, date unknown)	regulatory action: "to select the most likely candidates among TRI chemicals for possible regulation under TSCA" (1)	chemical-specific
47	Priority Setting of Existing Chemicals (5)	By authors for the European Community (Weiss et al., 1988)	priority setting: "for priority ranking of existing chemicals with regard to their possible effects on the environment" (5)	chemical-specific
48	Multi-Media Environmental Pollutants Assessment System (MEPAS), formerly the Remedial Action Priority System (RAPS) (4)	By and for U.S. DOE (Whelan et al., 1987; Droppo et al., 1989; Strenge et al., 1989; Whelan et al., 1992)	"as a means of ranking their hazardous, radionuclide, and mixed waste sites" (4)	site ranking
49	Canadian Accelerated Reduction/Elimination of Toxics (ARET) Scoring Protocol (3)	By Canadian Labor Congress for the Canadian government (CLC, 1992; ARET, 1993)	priority setting regulatory action: may be used in various ways for pollution prevention programs in Canada	chemical-specific
50	RA Guidance under CERCLA, screening chemicals of potential concern	US EPA, 1989d	impact evaluation: to select chemicals of potential concern for a baseline risk assessment under CERCLA	chemical-specific
51	EC Proposal for Priority Setting of Existing Chemical Substances (3)	(van der Zandt and van Leeuwen, 1992) (Draft)	priority setting: To identify substances which might pose a "real and significant risk to man and the environment"	chemical-specific

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NOTES:

Table B-1, continued

(a) System numbers are used only as a shorthand method of tracking the systems. They were based on a preliminary alphabetical list of references, but at this time are essentially an arbitrarily assigned number.

(b) A chemical-specific approach is one that includes ranking, scoring or categorizing a list of chemicals based on chemical-specific properties

(1) described in Appendix A of Abt Assoc., 1992

(1') mentioned briefly in Abt Assoc., 1992

(2) discussed by Davis & Jones, 1993

(3) discussed in ICF, 1993

(4) discussed in Waters et al., 1993

(5) discussed in Annex II "Scoring Systems, Description and Evaluation" (author unknown)

(6) discussed in Foran and Glenn, 1993

(7) Hushon and Kornreich, 1984

(8) OECD 1986

(9) discussed in Environ, 1986

(a prime indicates a system was listed or mentioned briefly, but not discussed in that reference)

DNR: Department of Natural Resources

IJC: U.S./Canadian International Joint Commission

GWU: George Washington University

OPPT: Office of Pollution Prevention and Toxics

**Table B-2. Overview of Developers/Users, Purpose, and Approach for Systems Identified but not Evaluated**

<b>System No.</b>	<b>System Name</b> (in the absence of a system name, the title of the document is cited)	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
53	NY State Dept of health System (4)	(Hawley, 1985)	"to evaluate the potential human health risks due to hazardous waste disposal sites" (4)	
54	RCRA hazardous waste 40 CFR 261 (4)	(U.S. EPA, 1980)		
55	Multistage Scoring (ITC) Scoring System (3,7,8,9)	by Clement Assoc. for ITC/U.S. EPA (ITC, 1977; U.S. EPA, 1977; Nisbet, 1979; Walker, 1993)	"to identify chemicals for further testing" (8)	chemical-specific
56		Roy et al., 1989 (4)		
57		(NFPA, 1980) (4)		
58	Environmental Hazard Assessment of New Chemicals Using Level Zero Data (5,8)	by and for UK DoE (Hinchcliffe, 1982)	to screen new chemicals to determine need for further testing (8)	
59	TRI chemical ranking system (1')	US EPA Office of Water __		
60	EPA Compound Evaluation System (1')	EPA __		
61	National Air Toxics Information Clearinghouse Pollutant Selection and Prioritization Method (1')			
62	OTS Chemical Scoring System (1',7,8,9)	by ORNL, for EPA OPTS (Ross and Lu, 1981)	"to select chemicals for more indepth evaluation by OPTS" (7)	

Table B-2, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited) <u>System No.</u>	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
63	Union Carbide Corp. Industrial Hygiene Sampling and Monitoring Program List (1)	Union Carbide Institute Plant, 1984	to develop a list of priority chemicals for plant monitoring program (1)	
64	Philadelphia Air Pollution Control Board Toxic Air Contaminants List (1)	Air Pollution Control Board of the Phil. Dept of Public Health, 1981	develop chemical lists to require industry emissions reports (1)	
65	DOT Poisonous Substances List (1)	DOT Hazardous Materials Regulations, 49 CFR 172.101		
66	NJ Dept of Environmental Protection Highly Toxic Substances List (1)	State of NJ Dept of Environmental Protection, Division of Environmental Quality		
67	California Air Resource Board Toxic Chemical List (1)	Air Resource Board of the State of California	(any chemical listed in the NIOSH/OSHA Pocket Guide w/ IDLH <2000ppm and VP >20 torr) (1)	
68	Rapid Screening and Identification of Airborne Carcinogens of Greatest Interest (7,8')	by SAI, for California Air Resources Board (Margler et al., 1979)		
69	Louisiana's Environmental Action Plan "Leap to 2000" (1)	Public Advisory and Steering Committee Risk Ranking Retreat Briefing Material, March, 1991		issue ranking
70	Air Toxic "Hot Spots" Program Risk Assessment Guidelines (1)	California Air Pollution Control Officers Association, March, 1990		

Table B-2, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited) <u>System No.</u>	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
71	Chemical on Which Data are Currently Inadequate: Selection Criteria for Health and Environmental Purposes (1)	Organization for Economic Co-operation and Development, Berlin, March, 1985	[NOTE: WMS system "follows the lines of the OECD report"] general methodology for a step-wise selection process for chemicals using readily available data sources and expert judgement	
72	Rhone-Poulenc Environmental Index (1)	Rhone-Poulenc memo, July 25, 1991		
73	Select Organic Compounds Hazardous to the Environment and Human Health (7,8,9)	by SRI for NSF (Brown et al., 1975; Nelson et al., 1975; Stephenson, 1977)	"to identify high- exposure compounds for review by NSF panel" (7) "to establish priorities for environmental and human health research" (8)	
74	System for Rapid Ranking of Environmental Pollutants (7,8,9)	by SRI for EPA/ORD (Brown et al., 1976; 1978)	"to choose chemicals on which to prepare scientific and technical reports (STARs)" (7)	
75	TSCA-ITC Scoring System Workshop (7,8)	by Enviro Control Inc for EPA/ITC (Enviro Control Inc., 1979)	"to develop and improved, integrated health and environmental effects scoring system to identify chemicals for which testing is required for ITC" (7)	
76	Hazard Evaluation Procedure for Potentially Toxic Chemicals (7,8)	by Monitoring and Assessment Research Centre (MARC), for UNEP (Harriss, 1976)	"screening procedure to identify high-risk chemicals" (7)	

Table B-2, continued

<u>System No.</u>	<b>System Name</b> (in the absence of a system name, the title of the document is cited)	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
77	Hazard Assessment by a Qualitative System (7,8)	by Assn. Chimie et Ecologie for the French Ministere de l'Environment (Jouany et al., 1982; 1983)	"to determine whether a new chemical represents a hazard based on MPD data" (7) and to determine further information needs (8)	chemical ranking
78	Integrated Environment Management Program (1,9)	(IEMP, 1983): Integrated Env Mgmt Program, briefing notes from Alan M. Ehrlich	"to incorporate the severity of the toxic effect into a chemical release ranking system (1)	
79	Pesticide Manufacturing Air Prioritization (7,8')	by Monsanto, for EPA/IERL (Archer, et al., 1978)	"to characterize airborne exposures to synthetic organic pesticides" (7)	
80	Sequential Testing for Chemical Risk Assessment (7,8',9)	by and for Eastman Kodak Co. (Astill et al., 1980)	"to rank the toxicity of a new chemical by a variety of routes and test systems"(7)	
81	Index of Exposure (7,8')	By Auerbach Assoc., for EPA (Auerbach Assoc., Inc., 1977)	"to indicate the relative potential for exposure associated with a given use of each chemical"(7)	
82	Chemical Hazard Ranking System (7,8')	by IIT Research Institute, for CPSC (Becker, 1978)	"to rank chemical components of consumer products by probable health impact"(7)	
83	System for Evaluation of the Hazards of Bulk Water Transportation of Industrial Chemicals (7,8',9)	by NAS, for U.S. Coast Guard (Beckman et al., 1974)	"to identify hazards of chemicals being transported by water"(7)	

Table B-2, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited) <u>System No.</u>	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
84	BAAR Inc. Model (7,8,9)	by Booz-Allen Appleid Research Inc. (1973; 1975), for EPA/SWRL	"to develop a system to rank dumpsite chemicals as to whether they present a hazard" (7)	
85	Ranking Algorithm for EEC Water Pollutants (7,8,9)	by SRI, for the European Economic Community (EEC) (Brown et al., 1980)	"to select a subset of chemicals present in the aquatic environment for further study" (7)	
86	Setting Priorities for Research and Development on Army Chemicals (7,8,9)	by SRI, for USAMRDC, (Brown et al., 1977; 1978)	"to select research priorities"(7)	
87	Estimating the Hazard of Chemical Substance to Aquatic Life (7,8')	by ASTM Committee D-9 (Cairns et al., 1979)	"to determine what impact chemicals will have on aquatic life"(7)	
88	Estimation of Toxic Hazard - a Decision Tree Approach (7,8')	by Flavor and Extract Manufacturer's Assoc. (FEMA) (Cramer et al., 1978)	"to identify potentially dangerous food constituents for additional testing" (7)	
89	An Approach to Prioritization of Environmental Pollutants: the Action Alert System (7,8')	by A.D. Little, for EPA/OWRS (Fiksel and Segal, 1982)	"to help the OWRS to set priorities regarding chemicals identified in water"(7)	
90	Scoring of Organic Air Pollutants (7,8,9)	by MITRE corp, for EPA/OAQPS (Fuller et al., 1976)	"to select organic air pollutants for more indepth study"(7)	
91	Ranking of Environmental Contaminants for Bioassay Priority (7,8')	by SRI, for NCI (Gori, 1977)	"to select chemicals for NCI bioassay" (7)	

Table B-2, continued

<b>System Name</b> (in the absence of a system name, the title of the document is cited) <u>System No.</u>	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
92	PHL Model (7,8')	(Hagerty et al., 1973)	"to identify landfill components likely to represent human health hazards" (7)
93	Selection of Chemicals for Inclusion in a Trend Monitoring (7)	by MITRE, for Federal Republic of Germany (Hushon et al., 1978)	"to select chemicals and chemical classes to include in a monitoring program to follow trends" (7)
94	RCRA Risk/Cost Policy Model (1',7,8',9)	by ICF Inc., for EPA/OSW (ICF Inc., 1982; 1984)	"to identify relative risks from exposure to chemicals in wastes" (7)
95	Ranking of Food Contaminants (7,9) or Priority Setting of Toxic Substances for Guiding Monitoring Programs (8')	by Clement Assoc., for OTA (Kornreich et al., 1979; 1980)	"to identify for OTA organics, inorganics, and radionuclides that are possible food contaminants" (7)
96	National Occupational Hazard Survey (7,8')	by and for NIOSH (NIOSH, 1977)	"to rank hazards according to the amount of occupational exposure" (7)
97	Assessment of Oncogenic Potential (7,8')	by Hooker Chemical (Nees, 1979)	"to identify carcinogens and to rank them relative to the evidence" (7)
98	ITC Scoring for Exposure (7)	by Clement Assoc., for EPA/ITC (OTS/EPA, 1977)	"to rank chemicals on the basis of potential for human exposure and environmental release" (7)
99	Ordering of Commercial Chemicals on NIOSH's Suspected Carcinogens List (7,8')	by EPA/OTS (OTS/EPA, 1977)	"to determine which suspected carcinogens are of concern to OPTS" (7)

Table B-2, continued

<u>System No.</u>	<b>System Name</b> (in the absence of a system name, the title of the document is cited)	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
100	Identification of High-Risk Occupational Groups and Industrial Processes Using RTECS/NOHS Data (7,8,9)	by Tracor Jitco, for NIOSH DCCP/NCI (Pielmeier, 1981; NIOSH, 1983)	"tool to objectively assess potential health risk from workplace exposures" (7)	
101	OECD Ecotoxicology Testing Scheme (7)	by Battelle, for EPA/OPTS (Pommeroy et al., 1980)	"to test how well aquatic tests predict hazard potential" (7)	
102	Ranking Animal Carcinogens (7,8,9)	Squire (1981)	"to classify animal carcinogens to permit the use of different regulatory options" (7)	
103	Environmental Scoring of Chemicals (7)	by ORNL, for EPA/OTS (Ross and Welch, 1980)	"to select chemicals presenting an environmental risk under TSCA and for use by ITC to identify chemicals for additional environmental testing" (7)	
104	Catalogue of Water Pollutants (8)	Germany: (Unweltbundesamt, Berlin, 1979; 1983)	"to place substances into categories according to their potential for water pollution" (8)	
105	UBA Environmental Hazard Ranking System (8)	for German Umweltbundesamt (SRI Intl, 1982; Klein and Haberland, 1982)	"multi-stage scoring system to screen <u>new</u> chemicals for further decisions, including testing needs" (8)	
106	Defining Priorities for the Italian Inventory of Substances (8)	(Costatini et al., 1982)	to develop a national inventory of chemical substances relevant to human health and environmental risk (8)	

Table B-2, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited) <u>System No.</u>	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
107	MITI and Ministry of Health and Welfare System (8)	Japan: MITI and Ministry of Health and Welfare (Kobayski, 1981)	"sequential testing system for selection of chemicals for regulation" (human health and environment) (8)	
108	NEDF Technical Department System (8)	Sweden: National Environmental Protection Board (Firm, 1982)	"to identify and classify industrial chemicals by industry segment with environmental concern" (8)	
109	Dangerous Substances Which Might be Included in List 1 (8)	for the EEC (Official Journal of the European Communities, 1982)	to determine dangerous substances (aquatic environment) which might be included in List 1 of Council Directive 76/464/EEC (8)	
110	FDA Levels of Concern (8,9)	U.S. FDA (1982)	"specific criteria for establishing the safety of new additives and to assure their continued safety" (8)	
111	Priorities for the Evaluation of Flavoring Substances (8)	Joint FAO-WHO Expert Committee on Food Additives (Stofberg, 1981)	"to establish, in decreasing order of potential health hazard, the order which flavoring materials should be evaluated" (8)	
112	Selection for Environmental Survey Programme (8)	Japanese Environment Agency (1983)	"for selection of environmentally persistent chemicals for long-term monitoring" (8)	
113	Review of Strategies for Identifying Hazardous Chemicals (8)	Canada, Dept. of Health and Welfare (Van Netten)		

Table B-2, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited) <u>System No.</u>	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
114	Environmental Hazard Ranking System (8')	by SRI, for German UBA (Klein and Haberland)		
115	OTS Pre-screening System (8')	by A.D. Little, for EPA		
116	Cosmetics Ingredients Review (8')	by CIFA, for CIPA [sic]		
117	Food Animal Additives (8')	by and for FDA		
118	Automatic Procedure for Carcinogen Assessment (8')	by Dehn et al, for NCI		
119	Investigation of Industrial Chemicals as Potential Food Contaminants (8',9)	by and for FDA (Oiler et al., 1980)	"to evaluate toxic materials that may be residues in food supplies" (9)	
120	System for Food Safety Assessment (8')	by the Food Safety Council		
121	Hazard Assessment of Chemicals in the Aquatic Environment (8')	by Branson		
122	Multimedia Environmental Goals for Environmental Assessment (8')	by Cleland et al., for EPA		
123	Environmental Assessment Sampling and Analysis	by Dorsey et al., for EPA		

Table B-2, continued

System No.	System Name (in the absence of a system name, the title of the document is cited)	Developers/users (reference)	Purpose	Overall approach <sup>b</sup>
124	Identification Systems for Selecting Chemicals as Candidates for Evaluation (8')	by Battelle, for EPA (Flinn et al.)		
125	Ranking of Hazardous Materials by Means of Hazard Indices (8')	by Jones		
126	Priority Pollutants (8')	by Keith and Telliard		
127	Environmental Safety of New Materials (8')	by Monsanto, for ASTM (Kimerle et al.)		
128	Economics-Based Methodology for Projecting Future Pollution Problems (8')	by Battelle, for EPA (Stacey and Flinn)		
129	Criteria and Procedures for Chemical Selection (8')	by SRI, for NCI		
130	Toxicity Testing - Strategies to Determine Needs and Priorities (8',9)	by Nat'l Research Council of NAS, for the Nat'l Toxicology Program/Nat'l Institute of Environmental Health Sciences (NRC, 1982)	"to develop criteria for selecting substances and determining toxicity-testing needs" (9)	
131	International Report: Priority Pollutants Project (8',9)	by UNEP (UNEP, 1978)	"to identify and control hazardous environmental chemicals" (9)	
132	Criteria to Select Chemicals for Carcinogenicity Testing (8')	for IARC		

Table B-2, continued

<b>System Name</b> (in the absence of a system name, the title of the document is cited) <u>System No.</u>	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>	
133	Assessment of Air Emissions from Hazardous Waste, Treatment Storage and Disposal Facilities (9)	by Land Disposal Branch of the OSW (CGA, 1983)	"to prioritize chemicals which are potential air pollutants at hazardous waste treatment, disposal and storage facilities" (9)	chemical ranking
134	Toxicity Scoring System Using RTECS Database (9)	by Clement Assoc., for the Hazardous and Industrial Waste Division of OSW (Clement, 1982)	"to classify substances according to their inherent hazard" (9)	chemical ranking
135	Washington State, Degree of Hazard Scheme (9)	Washington Department of Ecology (1978)	to "classify wastes for purposes of characterization and management" (9)	
136	Rhode Island, Degree of Hazard Scheme (9)	State of Rhode Island (1981)	"for the classification and management of hazardous wastes" (9)	
137	California Degree of Hazard Scheme (9)	State of California Department of Health Services (1982)	to "classify wastes for purposes of waste management" (9)	
138	Management of Hazardous Wastes by Degree of Hazard (9)	Chemical Manufacturers Association (CMA, 1979)	"for use in the management of hazardous wastes" (9)	
139	Classification by Degree of Hazard (9)	by Dow Chemical USA (Dow Chemical, 1979)	to place substances in hazard categories (9)	
140	Steps Towards Environmental Hazard Assessment of New Chemicals (9)	(Schmidt-Bleek et al., 1982)	"to select from many new chemicals, a few which are potentially Hazardous" (9)	
141	Environmental Impact Evaluation of Hazardous Waste Disposal in Land (9)	(Pavoni et al., 1972)	"a priority-rating system which evaluated quantitatively the environmental impact resulting from the landfilling of hazardous wastes" (9)	

Table B-2, continued

	<b>System Name</b> (in the absence of a system name, the title of the document is cited) <u>System No.</u>	<b>Developers/users</b> (reference)	<b>Purpose</b>	<b>Overall approach<sup>b</sup></b>
142	IARC Carcinogen Ranking Scheme (9)	(IARC, 1982)	"to be used in the assessment of the carcinogenicity of a chemical" (9)	
143	EPA-CAG Carcinogen Ranking Scheme (9)	(EPA, 1984)	"to assess the weight of evidence that a chemical is a carcinogen" (9)	
144	National Toxicology Program Carcinogen Ranking Scheme (9)	(NTP, 1984)	a series of categories relating to the strength of experimental evidence that a chemical is a carcinogen (9)	
145	RCRA Risk-Cost Analysis Model (1)			
146	Polaroid Five-Category Ranking Scheme (1)	Polaroid Corporation, 1991	to categorize chemicals in order to set goals for chemical use reduction based on the Mass. Toxics Use Reduction Act	
147	<u>The Boston Herald</u> Algorithm (1)	<u>The Boston Herald</u> , May 13, 1991	considers volume and toxicity to rank chemical releases	chemical ranking
148	The European Communities Council Directive Chemical Hazard List (1)	EEC, 1982	An industry must list its uses of any of the chemicals on the list as mandated by the EC	

NOTES:

(a) System numbers are used only as a shorthand method of tracking the systems. They were based on a preliminary alphabetical list of references, but at this time are essentially an arbitrarily assigned number.

(b) A chemical-specific approach is one that includes ranking, scoring or categorizing a list of chemicals based on chemical-specific properties

(1) described in Appendix A of Abt Assoc., 1992

(1') mentioned briefly in Abt Assoc., 1992

(2) discussed by Davis & Jones, 1993

(3) discussed in ICF, 1993

(4) discussed in Waters et al., 1993

(5) discussed in Annex II "Scoring Systems, Description and Evaluation" (author unknown)

(6) discussed in Foran and Glenn, 1993

(7) Hushon and Kornreich, 1984

(8) OECD 1986

(9) discussed in Environ, 1986

(a prime indicates a system was listed or mentioned briefly, but not discussed in that reference)

DNR: Department of Natural Resources

IJC: U.S./Canadian International Joint Commission

GWU: George Washington University

OPPT: Office of Pollution Prevention and Toxics

