

## CONTENTS

1. INTRODUCTION . . . . .	1
1.1 Scope . . . . .	1
1.2 Industrial and Hazardous Waste Production . . . . .	11
1.3 Types of Waste Produced . . . . .	14
1.4 Federal Protocol for Handling, Treating and Disposal . . . . .	28
1.5 Wastewater Impoundments . . . . .	32
1.6 Environmental Considerations . . . . .	33
2. ENVIRONMENTAL IMPACT OF IMPOUNDMENT OPERATIONS . . . . .	35
2.1 Water Quality: Groundwater and Drinking Water. . . . .	35
2.2 Land Usage and Solid Waste . . . . .	39
2.3 Handling and Disposal of Hazardous Wastes . . . . .	42
3. REGULATORY CLIMATE . . . . .	51
3.1 Federal (RCRA Legislative Intent, Description and Regulations) . . . . .	51
3.2 Toxic Substances Control Act . . . . .	71
4. STATE REGULATORY CLIMATE . . . . .	79
4.1 Hazardous Waste Surveys . . . . .	79
4.2 Hazardous Waste Transportation Control . . . . .	85
5. PROPERTIES OF SLUDGES AND DISPOSAL ALTERNATIVES . . . . .	97
5.1 Literature Survey of Treatment Methods . . . . .	97
5.2 Considerations for Landfill of Toxic Sludges. . . . .	107
5.3 Pretreatment Methods . . . . .	109
5.4 Properties of Hazardous Industrial Sludges . . . . .	121
6. IN-PLANT HOUSEKEEPING AND SIZE REDUCTION TECHNIQUES . . . . .	133
6.1 Hazardous Chemical Spills. . . . .	133
6.2 Size Reduction of Wastes . . . . .	137
7. SITING CONSIDERATIONS. . . . .	143
7.1 Groundwater Patterns . . . . .	143
7.2 Climatic Conditions . . . . .	151
7.3 Effect of Runoff . . . . .	155

8.	PACKAGING, TRANSPORTATION AND DISPOSAL . . . . .	165
8.1	Hazardous Waste Management Facilities . . . . .	165
8.2	EPA Guidelines for Waste Treatment Facilities . . . . .	171
8.3	EPA Recommendations for Monitoring Waste Facilities . . . . .	174
8.4	Packaging and Disposal . . . . .	186
9.	IMPOUNDMENT FACILITIES AND LINERS . . . . .	189
9.1	EPA Experimental Studies . . . . .	189
9.2	Properties of Liners and Selection Criteria . . . . .	197
9.3	Liner Installation . . . . .	204
10.	OPERATION OF FACILITIES . . . . .	211
10.1	Overview of Landfill Disposal Methods and Management . . . . .	211
10.2	Design Considerations for Sanitary Landfills . . . . .	217
10.3	Cell Construction . . . . .	227
10.4	Equipment for Landfill Operations . . . . .	234
10.5	Landfill Operations . . . . .	241
10.6	Land Application of Municipal Wastewater Effluents . . . . .	247
11.	ANALYTICAL TECHNIQUES FOR WASTE CLASSIFICATION . . . . .	257
11.1	Sampling Procedures for Sanitary Landfill Leachate . . . . .	257
11.2	Testing Methods for Physical and Chemical Properties . . . . .	263
12.	STATE INDUSTRIAL WASTE PROGRAMS . . . . .	281
12.1	Manifest System—General . . . . .	281
12.2	Regulatory Considerations . . . . .	285
12.3	Example of a Hazardous Waste Decision Model . . . . .	291
12.4	Handling and Disposal of Incompatible Wastes . . . . .	300
12.5	General Remarks . . . . .	300
13.	HAZARDOUS WASTE MANAGEMENT IN NEW YORK STATE— A CASE STUDY . . . . .	303
13.1	Introduction . . . . .	303
13.2	Case Studies . . . . .	304
13.3	The New York State Hazardous Waste Inventory . . . . .	306
13.4	Improper Management of Hazardous Wastes in New York State . . . . .	311
13.5	Hazardous Waste Management Facilities in New York State . . . . .	312
13.6	State Legislation . . . . .	312
13.7	Special Problem Areas . . . . .	314
13.8	Miscellaneous Activities . . . . .	315

APPENDIX A. Public Law 94-580—The Resource Conservation and Recovery Act . . . . .	321
APPENDIX B. The Toxic Substances Control Act . . . . .	369
APPENDIX C. Proposed Guidelines for State Hazardous Waste Programs . . . . .	381
APPENDIX D. Implementation of the Resource Conservation and Recovery Act . . . . .	397
APPENDIX E. Position Statement Regarding Effective Hazardous Waste Management (Nonradioactive) . . . . .	413
APPENDIX F. Hazardous Waste Guidelines and Regulations . . . . .	417
APPENDIX G. General Provisions for Toxic Substances Control and Solid Waste Disposal . . . . .	423
APPENDIX H. EPA's Current Schedule for Promulgating Regulations Under the Resource Conservation and Recovery Act (Public Meeting, Opening Remarks) . . . . .	435
REFERENCES	441
INDEX	461