

CONTENTS

1.	INTRODUCTION	1
	1.1. Objectives	1
	1.2. Scope	2
	1.3. structure	2
2.	ORIGIN AND CHARACTERISTICS OF ORGANIC WASTE.	3
	2.1. Solid organic radioactive waste	4
	2.1.1. Origins of solid organic radioactive waste	4
	2.1.2. Key characteristics of solid organic radioactive w a s t e	5
	2.1.3. Potential hazards posed by solid organic r a d l o a c t i v e w a s t e	6
	2.2. Liquid organic radioactive waste	6
	2.2.1. Origins of liquid organic radioactive waste	6
	2.2.2. Key characteristics of liquid organic r a d i o a c t i v e w a s t e	8
	2.2.3. Potential hazards posed by liquid organic r a d i o a a c t i v e w a s t e	8
	2.3. Gaseous organic radioactive waste	8
	2.4. Mixed phase organic radioactive waste	Y
3.	SELECTION OF A WASTE MANAGEMENT STRATEGY	10
	3.1. Selection criteria	10
	3.1.1. Technical criteria	10
	3.1.2. Non-technical criteria	11
	3.2. Waste management options	12
	3.2.1. Waste minimization and segregation	13
	3.2.2. Continued storage as raw waste	14
	3.2.3. Conversion to a less hazardous form	14
	3.3. Decision making	16
4.	INTERIM STORAGE AND TRANSPORT OF UNTREATED ORGANIC WASTE ...	16

4.1. storage	16
4.1.1. Solidwaste	17
4.1.2. Liquid waste	17
4.1.3. Liquid - solid waste mixtures	18
4.2. Transport	19
5. TREATMENT AND CONDITIONING TECHNIQUES	19
5.1. Non-destructive techniques	21
5.1.1. Drying and evaporation	21
5.1.2. Distillation	24
5.1.3. Physical conditioning/separation	24
5.1.4. Decontamination of organic radioactive solids andliquids	25
5.1.5. Absorption	26
5.1.6. Compaction	28
5.1.7. Direct immobilization	30
5.2. Destructive techniques	34
5.2.1. Conventional incineration	34
5.2.2. Pyrolysis	44
5.2.3. Alkaline hydrolysis	46
5.2.4. Vitrification	47
5.2.5. Plasma treatment	48
5.2.6. Molten salt oxidation	52
5.2.7. Electrochemical methods	53
5.2.8. Direct chemical oxidation	54
5.2.9. Acid digestion	55
5.2.10. Wet oxidation	55
5.2.11. Advanced oxidation processes	57
5.2.12. Supercritical water oxidation	59
5.2.13. Solvate electron oxidation	60
5.2.14. Biological treatment	60
5.2.15. Advanced thermochemical treatment process	61
5.2.16. Microwave treatment	62
5.3. Conditioning of treated and secondary waste	63
5.3.1. Solid waste and residues	63
5.3.2. Liquid secondary waste	63
5.3.3. Sludges	64
5.3.4. Off-gases.	64

6.	PROPERTIES AND PERFORMANCE OF CONDITIONED WASTEFORMS	70
6.1.	Required properties	70
6.2.	Performance in storage	71
6.3.	Performance at disposal	72
7.	QUALITY ASSURANCE AND CONTROL	72
7.1.	Quality assurance programme	73
7.2.	Waste acceptance criteria	74
7.3.	Recordkeeping	75
7.4.	Quality control	75
8.	CONCLUSIONS	75
	REFERENCES	79
	CONTRIBUTORS TO DRAFTING AND REVIEW	87