MOL.20010727.0171

QA: N/A

United States
Environmental Protection
Agency

Solid Waste and
Emergency Response
(5305W)

EPA530-R-95-016
PB95-209672
November 1996

EPA National Capacity Assessment Report:

Capacity Planning Pursuant to CERCLA Section 104(c)(9)

Reproduced on Paper that Contains at least 20% Post Consumer Fiber

18.160

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL
INFORMATION SERVICE
SPRINGFIELD, VA 22161

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA530-R-95-016	2.	PB95-209672

4. Title and Subtitle
NATIONAL CAPACITY ASSESSMENT REPORT: CAPACITY PLANNING PURSUANT TO CERCLA SECTION 104(c)(9)

5. Report Date
NOVEMBER 1996

6.

7. Author(s)

8. Performing Organization Rept. No

9. Performing Organization Name and Address

U.S. EPA
OFFICE OF SOLID WASTE
401 M STREET, SW
WASHINGTON, DC 20460.

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address

13. Type of Report & Period Covered
FINAL REPORT 1996

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

DESCRIBES THE OUTCOME OF THE CAPACITY ASSURANCE PLANNING (CAP) PROCESS. PROVIDES AN OVERVIEW OF STATE AND EPA PHASE I ACTIVITIES. ADDRESSES METHODOLOGY ISSUES. DISCUSSES NATIONAL DATA AGGREGATED BY EPA, INCLUDING NATIONAL ASSESSMENT OF FUTURE CAPACITY AND CONCLUSIONS. APPENDICES INCLUDE DEMAND DATA SUBMITTED BY STATES, COMMERCIAL CAPACITY DATA SUBMITTED BY STATES, ADJUSTMENTS TO COMMERCIAL CAPACITY DATA, LIST OF COMMERCIAL FACILITIES, AND CAP MANAGEMENT CATEGORIES.

17. Document Analysis a. Descriptors

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement

RELEASE UNLIMITED

19. Security Class (This Report)	21. No. of Pages
UNCLASSIFIED	86
20. Security Class (This Page)	22. Price
UNCLASSIFIED	0.00

(See ANSI-Z39.18)

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)

TABLE OF CONTENTS

Executive Summary	3
Introduction	4
Background	4
Overview of State Phase 1 Activities	5
Data Development	6
Other Information in the Phase 1 Submittals	8
The 1994 CAPs and the 1991 BRS National Report	8
Overview of EPA Phase 1 Activities	9
Methodology Issues	9
Theoretical versus Practical Capacity	9
CAP Management Categories	10
Effects of Regulatory Changes on Capacity	10
Demand from Wastes Generated by Small Quantity Generators	11
Demand from Nonhazardous Wastes	11
Demand from Mixed Hazardous and Radioactive Wastes	11
Discussion of National Data Aggregated by EPA	12
National Assessment of Future Capacity	12
Conclusions	13
References	23
Appendix A: Demand Data Submitted by States	24
Appendix B: Commercial Capacity Data Submitted by States	38
Appendix C: Adjustments to Commercial Capacity Data	52
Appendix D: List of Commercial Facilities	56
Appendix E: CAP Management Categories	77

Executive Summary

Section 104(c)(9) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires States to assure that adequate capacity exists to treat and dispose of hazardous wastes generated in the States for 20 years before EPA can provide any Superfund remedial action in the State. Under a program the Agency has implemented to help States fulfill this statutory mandate, States submitted Capacity Assurance Plans (CAPs) to the Agency as the basis of their assurance. The first CAPs were submitted to the Agency in 1989. Through these CAPs, each State had to demonstrate that it had sufficient in-state capacity or agreements with other States to assure capacity for 20 years. Because of concerns raised by the States over the 1989 CAP process, the Agency worked closely with the States to develop a CAP process focusing on national capacity. On May 1, 1994, the States submitted CAPs to the Agency pursuant to the May 1993 *Guidance for Capacity Assurance Planning*, OSWER Directive 9010.02. This Report describes the outcome of the CAP process pursuant to the Guidance.

Based on the information contained in the CAPs submitted May 1, 1994, along with other information that was available to EPA, the Agency has determined as documented in this report that there exists adequate national capacity in all CAP management categories through the year 2013. This Report assesses the data used during this analysis and presents the resolutions to a number of methodological issues raised in conducting this assessment.

The States' CAP submissions contained data demonstrating knowledge of their existing hazardous waste management systems and projecting through 2013 the demand for commercial management and the commercial management capacity for treating these hazardous wastes. Data was presented for the years 1991, 1993, 1999, and 2013 in 14 different waste management categories and focused primarily on wastes regulated under Subtitle C of RCRA. The Agency reviewed the State-submitted data for consistency and accuracy. EPA then calculated the total national maximum demand on commercial Subtitle C management by aggregating the States' projected demand and commercial capacity for the year 2013.

While the Agency's analysis has shown that there is adequate national capacity through 2013, States, market areas and/or regional groupings of States should continue hazardous waste planning activities. Further planning activities will add to States' knowledge of their hazardous waste management systems, help them implement waste minimization programs, and encourage companies to replace inefficient treatment technologies with safer and more innovative technologies. Moreover, the national hazardous waste management system is dynamic, as shown by the ongoing consolidation and restructuring of the hazardous waste treatment industry. Thus, there is no guarantee that the current projected surpluses of hazardous waste treatment and disposal capacity will continue to exist. Because of this, the Agency will continue to periodically assess the national capacity situation against the "baseline" assessment presented in this report. Accordingly, although the Agency believes the information presented in this Report accurately indicates the presence of significant future treatment and disposal capacity, the Agency will continue to collect and evaluate additional data, if necessary, to ensure that the requirements of CERCLA 104(c)(9) are satisfied. Specifically, EPA will continue to evaluate the effects of final rulemakings on the Subtitle C capacity situation using information in this report as a baseline analysis. EPA currently does not anticipate a need for a large-scale data collection from the states, and will only request additional capacity information from the States if the Agency's analyses find it necessary. Any additional data collection effort will be performed only after close consultation with the States.

The Agency provided a draft of this Report to the States and the public for comment on the data and the procedures used to conduct the baseline national assessment. Based on the comments received on the draft Report, the Agency has finalized its assessment.

Introduction

Section 104(c)(9) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or Superfund law, requires States to assure that adequate capacity exists to treat and dispose of hazardous wastes generated in states for 20 years before EPA can provide any Superfund remedial action in the States. Under a program that EPA has implemented to help States fulfill this statutory mandate, States submitted Capacity Assurance Plans (CAPs) as the basis of their assurance. EPA then conducted an assessment of data from these plans to analyze the future availability of treatment and disposal capacity nationally through 2013. The statute specifies that adequate capacity must be within a State or outside a State in accordance with an interstate agreement or regional agreement or authority. In evaluating capacity nationwide, the Agency assumes private agreements for the interstate treatment or disposal of hazardous waste have been or will be executed if adequate capacity otherwise exists.

The Agency's baseline national assessment indicates that there exists adequate national capacity through 2013. This assessment is based on the data submitted by the States in their CAPs as well as other information that was available to EPA. In the case of States that did not submit a CAP, EPA used other data submitted by these States.

This Report describes: (1) the Agency's assessment that adequate national capacity exists, (2) the Agency's methodology used to conduct this assessment, and (3) the data used to conduct this assessment. The assessment was finalized with help from comments and new data that was used to supplement the Agency's draft assessment.

CERCLA 104(c)(9) requires that before Superfund remedial action is provided, the State in which the release occurs must first enter into a contract or cooperative agreement providing assurances of the availability of adequate hazardous waste treatment or disposal capacity. Because the hazardous waste universe is dynamic, before contracts or cooperative agreements are signed with States, the Agency will utilize the baseline national assessment detailed in this Report, together with additional more recent data on generation and management trends, as appropriate, to ensure that the requirements of CERCLA 104(c)(9) are satisfied.

Background

The Agency's current policy and process for implementing the CERCLA 104(c)(9) capacity assurance requirement is presented in the *Guidance for Capacity Assurance Planning* document dated May 1993, hereafter referred to as the Guidance. The Guidance describes a three-phased approach for States to assure the future availability of hazardous waste treatment and disposal capacity. The three-phased approach involves assessing capacity on a national level (Phase 1); addressing any projected shortfalls by States that have a demand exceeding their supply of capacity in a shortfall management category through waste minimization and continued development of both capacity that is permitted but not constructed and capacity with draft permits (Phase 2); and reevaluation of projected national capacity and addressing remaining national shortfalls with further state planning and waste minimization activities (Phase 3). This Report describes only the Phase 1 activities conducted to evaluate national capacity availability. Based on

this final assessment, the Agency has determined that States do not need to submit Phase 2 or Phase 3 CAPs.

Overview of State Phase 1 Activities

States prepared Phase 1 CAP submissions that were due to the Agency on May 1, 1994. The submissions consisted primarily of six data tables titled:

Table 1. 1991 Hazardous Waste Generated and Managed On Site;

Table 2. 1991 Management of Hazardous Waste in Captive Systems;

Table 3. 1991 Management of Hazardous Waste in Commercial Systems;

Table 4. Maximum Operational In-state Commercial Subtitle C Management Capacity;

Table 5. Demand for Commercial Hazardous Waste Management Capacity from Recurrent Waste Expected to be Generated in State; and

Table 6. Expected Maximum in-state Commercial Subtitle C Management Capacity.

States' Phase 1 CAP submissions, including these data tables, are available in EPA's RCRA Docket (Docket number F-92-CAGA-FFFFF). The first four tables demonstrate States' knowledge of their existing hazardous waste management systems; the last two tables show projected future demand for commercial management and projected commercial management capacity quantities for hazardous waste, respectively. The data provided by the States in the projection tables (i.e., Table 5 and Table 6), along with additional information on non-hazardous and Small Quantity Generator waste generation, were used by the Agency as the basis for its determination that adequate national capacity exists for the treatment and disposal of hazardous waste pursuant to Section 104(c)(9) through the year 2013. The CAP submissions focused primarily on wastes regulated under Subtitle C of RCRA. The Agency, when assessing capacity, also accounted for the impact of Subtitle D wastes on Subtitle C management capacity.

Some States chose to submit their CAP data collectively so as to be considered a single entity for the purposes of the Phase 1 national assessment. The collective submittals demonstrated these States' commitment to proactive dialogue for addressing regional waste management needs and provided an opportunity for these States to not have to submit a Phase 2 CAP. This opportunity would occur if EPA's national assessment identified projected national shortfalls, but the States submitting collectively had no projected shortfalls themselves, as demonstrated by combining their data.

The Agency provided States wishing to submit Phase 1 collectively the option to have the Agency present their individual data in aggregate form in this Report. The Agency received two collective submittals: one from the Western Regional Agreement, which consists of all the States in EPA Regions 8, 9, and 10, as well as Kansas, Nebraska, and Guam, and the other from the States of EPA Region 6. Only the States in the Western Regional Agreement asked that their data be presented in an aggregate form. In this Report, data from participants in the Western Regional Agreement are presented as the "Western States."

Data Development

Most States used the Biennial Reporting System (BRS) and the methodology in the Guidance to develop their data. Biennial Reports are completed by hazardous waste generators and treatment, storage, and disposal facilities every two years. The types of information requested in the Biennial Report on hazardous waste include the quantity, nature, disposition, and the efforts taken to reduce the volume and toxicity of hazardous waste. Some States used BRS-equivalent data sources to prepare their CAPs.

EPA provided States with instructions on how to use BRS data to produce CAP tables in the Agency's *Using Table Talk to Prepare CAP Tables Instructions Manual* (This document is available for review in the RCRA Docket). Following is a summary of the methodology used by most States to develop their CAP data.

Baseyear Data

The first step in developing data for the CAP submissions was to generate "baseyear" demand and capacity data. The year 1991 is the "baseyear" for most States because it is the most recent year for which States had a complete BRS database. States used the 1991 BRS data to estimate the demand for Subtitle C management capacity for on-site, captive, and commercial systems and the available quantities of commercial Subtitle C management capacity for the 14 CAP management categories. States that had 1992 data available chose to use that data instead, thereby avoiding some of the baseline data adjustments described in the following paragraph.

Baseline Data

After obtaining baseyear data, States had to adjust their demand and capacity data to change it from raw data direct from the BRS to data usable for making CAP projections. This adjusted set of data is referred to as baseline data and was used as the starting point for projecting future hazardous waste generation and management. Developing baseline demand data required adjusting the baseyear data, such as allocating the responsibility for assuring the adequacy of landfill capacity for certain treatment residuals (e.g., incinerator ash and stabilized residues) to those States where the waste was originally generated. Baseline capacity data does not differ from baseyear capacity data. It includes the capacity from operational units, including boilers and industrial furnaces (BIFs) burning hazardous waste, which came under RCRA regulation during 1991 and are currently operating under interim status.

1993 Projection Data

After developing their baseline data, States developed data for the first projection year, 1993. States made projections only for recurrent wastes; States were not responsible for projecting one-time waste demand. Because of the substantial burden developing the one-time waste projections would have placed on the States, the Agency agreed to develop these projections. The document *One-time Waste Estimates for Capacity Assurance Planning* (available in the RCRA Docket) describes the methodologies used and provides the projections that were developed.

To move from baseline to the 1993 projection year, States adjusted both their baseline demand and commercial capacity data. The 1993 data is the baseline data adjusted to account for:

- The shift in the management of wastes from land disposal and land farming to alternate management practices due to the Land Disposal Restrictions requirements that became effective in 1992 and consequently are not reflected in the 1991 baseyear data;
- Shifts in management caused by the expiration of the F037 and F038 national capacity variances;
- The ultimate management of in-state wastes initially shipped to transfer/storage facilities;
- The closure of facilities and/or the declassification of hazardous wastes;
- The changes in capacity caused by commercial management facilities opening or closing between 1991 (or 1992, for those States using 1992 data) and 1993; and
- The decreases in in-state landfill capacity to reflect the depletion of landfill capacity over time.

1999 Projection Data

As requested in the Guidance, States also developed recurrent waste projections for 1999. The Agency, in conjunction with a National Governors' Association workgroup, determined that 1999 is the furthest year for which reasonably accurate projections from 1993 could be made. Generally, based on Agency recommendations, States reported in their CAPs that demand and commercial capacity remained constant between 1993 and 1999. Changes in demand and capacity between these years are due to plant closures, the opening of new facilities, and shifts in the kind of management certain wastes receive. As with the 1993 data, States accounted for the depletion of landfill capacity between 1993 and 1999 and the impact of closures of treatment and/or disposal units. States also included as capacity in the 1999 projection year other commercial units that are permitted, constructed, and operating partially, as well as capacity from unopened cells in permitted landfills.

2013 Projection Data

The States' 2013 projections were made consistent with the requirements of CERCLA 104(c)(9) for a 20-year assurance, and were used by the Agency to conduct its national assessment. As recommended for the 2013 projection year, States held their demand constant from the 1999 levels. States also held their maximum available commercial Subtitle C capacity constant from 1999, again except for commercial landfill capacity, which was depleted over the projection period, or where it was known that a commercial facility will close.

Other Information in the Phase 1 CAP Submittals

Along with the data tables, most States also included in their Phase 1 submittals a narrative description of their current and planned waste minimization programs, written descriptions of changes in their State hazardous waste management systems since their last CAP submissions (in 1992), information regarding collective State planning efforts, and a list of commercial facilities in their State. Some States submitted a discussion of the public participation efforts they undertook to inform citizens about the State's hazardous waste planning activities.

The 1994 CAPs and the 1991 BRS National Report

Although most States used the 1991 BRS data to prepare their 1994 CAPs, there will be differences between the data in the *1991 BRS National Report* and the data contained in this Report. The *1991 BRS National Report* data and the CAP data are not directly comparable for the following reasons:

- The *1991 BRS National Report* identifies quantities of RCRA waste generated based upon the RCRA permit status of the unit managing a hazardous waste and therefore excludes from any national analysis RCRA wastes reported as managed in systems exempt from RCRA permitting requirements. The CAP identifies the potential demand for RCRA Subtitle C capacity and therefore, may include RCRA wastes that were shipped off-site to be managed in systems exempt from RCRA permitting requirements.

- The BRS identifies quantities of hazardous wastewaters generated, which includes direct discharges to POTWs and direct discharges to surface waters under NPDES. These quantities are excluded from the CAP demand estimates because they are managed in RCRA-exempt units.

- For their CAPs, States allocated "other".and "unknown" categories of BRS data to the appropriate management categories using their best judgement or other data sources.

- Some States used information in their own State data systems (usually containing information derived from manifests), not BRS data, to prepare their CAPs.

- The 1991 BRS Report includes data that are excluded from the CAPs, such as mixed radioactive and hazardous waste.

- CAP data contain the capacity from some RCRA-exempt commercial recyclers that the BRS data may not capture.

Overview of EPA Phase 1 Activities

EPA's primary role in Phase 1 was to ensure consistency among State data so that a national aggregation would be meaningful, and to identify problems with the Phase 1 submittals. EPA compiled the data submitted by the States, along with other available information, to assess the total national maximum demand on commercial Subtitle C management by CAP Management Category for all projection years by:

(1) Aggregating State projected demand for management of recurrent waste at commercial management systems;

(2) Reducing this sum by 10 percent[1] in the year 2013 to recognize ongoing waste minimization efforts; and

(3) Adding to this aggregation estimates of demand on commercial hazardous waste management capacity from one-time waste generation.

Once the national aggregate demand was calculated, the Agency assessed the maximum operational commercial capacity available nationwide by aggregating each State's Agency-adjusted maximum capacity projected for all projection years by CAP Management Category. The Agency then compared national demand to national supply to assess the availability of future management capacity for hazardous wastes.

Methodology Issues

Upon reviewing the data submitted by the States, the Agency identified some issues it needed to address before it could complete the assessment of national capacity. The following discussion describes the issues and their resolution. Most of the resolutions err on the side of overestimating demand and underestimating capacity. All adjustments to State data are described in Appendix C.

Theoretical versus Practical Capacity

The Agency found that some capacity information reported from the BRS Process System forms was not useful for CAP purposes because the reported capacity was actually the maximum theoretical design capacity of the facility, not the practical operating capacity. To evaluate capacity for the facilities where this happened, the Agency calculated a practical operating capacity reflecting real-time operational limitations, which include such considerations as down-time, permit restrictions, and the optimization of operation for profit.

A confounding variable to the problem of excessive reported capacity is the conversion of capacity estimates into consistent units of measurement. Theoretical management system design capacity estimates are often measured in units such as British Thermal Units (BTU) per hour for incinerators and cubic yards

---

[1] This figure was obtained after consultation with the States as a conservative estimate of the effects of existing waste minimization activities on the generation of recurrent wastes.

for landfills. Since tonnage was the measurement unit requested for all CAP information, many facility capacities had to be converted to tons. This was done by making assumptions about operating conditions and average waste characteristics. For example, when an incinerator designed on a BTU per hour basis is converted to tons per year, assumptions about average waste heating value and density need to be made. Often the assumptions developed assumed ideal, not real-time operation.

To resolve the issue of theoretical versus practical capacity, the Agency compared the State-reported capacities to other data sources (e.g., the Hazardous Waste Treatment Council Industry Survey and the *EI Digest* -- see References section). The Agency assigned practical capacity amounts to the facilities whose capacities differed most substantially from the data sources available to the Agency. These facilities are noted in Appendix C.

CAP Management Categories

The CAP Management Categories "Incineration - Sludges/Solids" and "Energy Recovery - Sludges/Solids" were developed assuming they would capture capacity only for nonpumpable wastes (i.e., wastes that could not be injection-fed into a combustion unit); however, some liquid injection incinerators reported in the BRS capacity for these categories as well as for "Incineration - Liquids and Gases and "Energy Recovery - Liquids". As the Agency discovered, this double-counting primarily occurred due to the wide interpretations of the term "sludge." To address this issue, the Agency developed pumpable and nonpumpable categories and included in these categories the appropriate system types.

The Agency also found that the BRS system codes for management by "Incineration" and "Energy Recovery" were reported inconsistently by generators and combustion facilities when they described how wastes were being managed. To address this issue for purposes of the capacity assessment, the Agency combined the categories into the two combustion management categories -Combustion - pumpable and Combustion - nonpumpable.

Effects of Regulatory Changes on Capacity

The CAP methodology only incorporates EPA regulations finalized by 1992. In order to conduct a broader capacity assessment, the Agency reviewed the major EPA regulatory developments since 1992 that may effect capacity. This review indicates that the proposed Hazardous Waste Identification Rulemaking (HWIR) and the Land Disposal Restrictions (LDR) rulemakings might have the most impact on Subtitle C waste management.

HWIR is an ongoing Agency effort which, if finalized, may modify the definition of hazardous waste. HWIR may decrease the demand from one-time and recurrent wastes on commercial Subtitle C capacity. HWIR probably will encompass two proposals. "HWIR-waste" could modify certain regulations regulating "listed" hazardous waste. Certain current regulations, including the "mixture" and "derived-from" rules, apply to listed wastes regardless of the concentration and the mobility of toxicants in the wastes, thereby regulating certain low risk waste - in particular, treatment residuals. The modifications may establish exemption standards for these low risk wastes. Additionally, the exempted wastes may no longer be subject to some of the hazardous waste management requirements. "HWIR-media" may modify the regulations for media contaminated with hazardous wastes (analogous to one-time wastes). This modification may allow media contaminated with hazardous wastes that have low concentrations of hazardous constituents to be regulated under rules less stringent than Subtitle C.

Land Disposal Restrictions (LDR) regulations set treatment standards for the disposal of hazardous wastes. EPA has developed six major LDR rulemakings to date. Most recently, the Agency's LDR Phase II rule (59 ER 47982) set treatment standards for wastes that have been identified as characteristically hazardous due to the presence of 25 organic constituents identified in the recent toxicity characteristic (TC) rule, coke and coke by-product wastes, cholorotoluene wastes and soil contaminated with the above listed wastes. Since the majority of these wastes contain organic constituents, the combustion technologies are most likely to be affected by this new rulemaking (see discussion later in this Report for our assessment.)

Demand from Wastes Generated by Small Quantity Generators

States were not asked to account for the demand from small quantity generators (SQGs) in their CAPs because SQGs are not required by federal law to complete a Biennial Report form. Although most States cannot gather SQG information from their State BRS data bases, EPA was able to obtain estimates of the demand on commercial management from SQGs using the BRS National Oversight Database[2]. EPA identified the generators of waste that was received by commercial hazardous waste management facilities in 1991 by examining the commercial waste management facilities' Biennial Report Waste Received (WR) forms. The Agency deleted from this list the generators who reported on the Biennial Report Information and Certification (IC) forms that they were large quantity generators or did not generate hazardous waste in 1991. The Agency then used information from commercial facilities who reported receiving waste from the remaining list of generators (i.e., the potential SQGs) to determine how SQG wastes were managed. This analysis showed that SQG wastes comprise only about one percent of all hazardous wastes received by commercial treatment facilities nationally.

Demand from Nonhazardous Wastes

As with SQG wastes, many States were unable to obtain the demand from nonhazardous waste from their State BRS databases. Nonhazardous wastes are wastes that are neither characterized as State hazardous nor federally defined as RCRA hazardous. The overall management trend for nonhazardous wastes is disposal in Subtitle D landfills.

While the demand for capacity from nonhazardous waste varies considerably by CAP Management Category, the demand from nonhazardous wastes as it relates to assessment of future capacity primarily affects the landfill CAP management category since landfill capacity depletes over time. EPA was able to estimate landfill demand from nonhazardous waste through discussions with the treatment industry and using estimates found in literature. The Agency's analysis of this demand appears in Table VI under the column "Non-RCRA Industrial Wastes."

Demand from Mixed Hazardous and Radioactive Wastes

As part of the Low-Level Radioactive Waste Policy Act (LLRWPA) of 1980 and its 1985 amendments, individual states or groups of states that form compacts are responsible for disposing of all the low-level radioactive mixed waste generated within their borders, except for waste produced by federal facilities (which the federal government has taken responsibility for). This Act establishes a waste

---

[2] The BRS National Oversight Database is maintained by EPA and contains BRS data from all states, including those that do not use the Biennial Report Forms.

management planning, treatment, and disposal framework independent of the CAP process that specifically deals with the disposal of non-federal radioactive mixed waste. For federal radioactive waste, the Federal Facilities Compliance Act establishes a planning process to ensure that these wastes are properly managed. In the Agency's judgment, treatment capacity for radioactive mixed wastes will be met through these planning mechanisms.

Discussion of National Data Aggregated by EPA

The tables which appear on pages 16 - 21 of the Report show EPA's aggregation of State-submitted data. The Agency adjustments to the State-submitted capacity data appear in Appendix C.

Table I, titled "1991 National Baseyear Data Representing Hazardous Waste Generated and Managed On Site," shows a national aggregation of 1991 baseyear demand data for waste managed onsite from their CAP Table 1.

Table II, titled "1991 National Baseyear Data Representing Management of Hazardous Waste in Captive Systems," presents the States' CAP Table 2 data aggregated nationally. This information was obtained by summing the quantities reported by States as wastes generated and managed in-state at captive facilities with the quantities of waste that are exported to captive facilities in other States. Captive facilities are facilities owned by the same company as the generator, but are at a different physical location. Their capacity can only be used by generators under the same ownership or by generators with whom the facility has an agreement to manage their waste.

Table III, titled "1991 National Baseyear Data Representing Management of Hazardous Waste in Commercial Systems," shows data from the State-submitted CAP Tables 3 and 4. These data were used as the starting point in developing projections. National demand figures for the baseyear were calculated by adding exports to wastes generated and managed in-state from State-submitted CAP Table 3 and then adding the maximum operational in-state commercial management from State-submitted CAP Table 4.

Table IV, titled "National Baseline and Projected Demand for Commercial Hazardous Waste Management Capacity," reports aggregated State demand for commercial capacity. This table shows the sum of each State's baseline and projection year recurrent waste demand data. The data, which has been adjusted by the Agency, is from CAP Table 5. Attached in Appendix A are the individual State-submitted tables showing this information. Also included in Table IV are the nationally aggregated one-time waste estimates that were developed by the Agency.

Table V, titled "National Baseline and Projected National Commercial Subtitle C Management Capacity," shows capacity data for the baseline and projection years submitted by States in their CAP Table 6, with Agency adjustments (which appear in Appendix C). Appendix B contains the individual State-submitted tables showing this information. Appendix D lists the commercial management facilities that make up this capacity.

National Assessment of Future Capacity

Table VI, titled "National Capacity Assessment of Projected Remaining Commercial Subtitle C Capacity Not Utilized by Hazardous Wastes," shows in the first column maximum available commercial

capacity from Table V minus the demand for 2013 from Table IV. The second, third, and fourth columns estimate the impact of the additional increases in demand that States were not asked to account for in their CAP submissions. The Land Disposal Restrictions Phase II rulemaking and demand from Small Quantity Generators and Industrial Subtitle D wastes will place additional demand on capacity. The final column shows the Agency's assessment of future capacity when considering the impacts of future Agency regulatory activities and the impact of waste demand not included in the State CAPs.

Assessment of New Rulemakings on Projected National Capacity

Although the LDR Phase II rulemaking will probably increase the demand for all treatments, the solids combustion category will be most affected by this rulemaking. Table VI indicates that, based on information made available with the rulemaking, there will exist sufficient combustion capacity for managing the hazardous wastes expected to be generated nationwide. In the next few years, the LDR program plans to finalize Phase III and Phase IV rulemakings. Both these rulemakings may increase the need for treatment capacity; however, EPA anticipates that future increases in demand for treatment of hazardous wastes due to the impact of the LDR program may be offset by the impact of HWIR. Regardless of the impact of the LDR Phase II and HWIR rulemakings, EPA believes the States have shown for the purpose of CERCLA 104 (c) (9) that there is adequate national capacity.

Assessment of EPA Demand Estimates on Projected National Capacity

An Agency analysis of the 1991 national BRS data showed that the demand from SQGs accounts for only 1 percent of the total demand on commercial Subtitle C management across all CAP Management Categories. The percentage contribution of SQGs on demand varies by CAP Management Category but is generally less than 4 percent of the total waste managed in each category.

During the development of the CAP Guidance, several States raised concerns about the demand being placed on commercial facilities by non-RCRA, non-state hazardous waste. The Agency found, based on a trade journal study, that about 20 percent of the waste going to landfills is neither RCRA nor State-hazardous. Again, however, this demand is more than covered by the available capacity, as can be seen in Table VI.

Conclusions

Based on its analysis of the data in this report and from other sources, the Agency has determined as documented in this report that adequate national capacity for the treatment and disposal of hazardous waste exists through the year 2013. Although EPA believes there is national capacity, States and regional groupings of States should continue hazardous waste management planning activities to assist EPA in ensuring that adequate capacity exists in the future. Further hazardous waste planning efforts may be important to a State and regional groupings of States for a number of reasons, including furthering and updating knowledge of hazardous waste management systems, helping to implement waste minimization programs, and encouraging companies to replace inefficient treatment technologies with safer and more innovative technologies.

While each State has demonstrated that there is adequate hazardous waste treatment and disposal capacity, there is the potential for unforeseen circumstances (e.g., new federal regulations, taxes on management, statutory limitations on landfills, and changing market conditions) that could affect the future availability of management capacity. Nationally, the industry is consolidating and restructuring. The

hazardous waste market's dynamism makes it difficult to guarantee that the current surpluses of hazardous waste management capacity will continue to exist. These factors should also prompt States to monitor the hazardous waste universe and continue their planning activities.

EPA recognizes that many States included as available capacity for 2013 facilities that were not in full-scale commercial operation or were operating under interim status in 1993. The inclusion of such facilities in CAPs is not evidence of a commitment on the part of the Agency or the States to bring these facilities on-line or to grant them part B permits. Capacity planning is intended to project into the future based on historical data and current knowledge. Including management facilities not yet fully operational or operating under interim status does not imply a State certification or intention that these facilities will receive their permits or become fully operational but rather is an attempt to evaluate future capacity based on the information representing waste management today. States and the Agency will continue to analyze capacity information, removing facilities that have dropped from the permitting process. Accordingly, although the Agency believes the information presented in this Report demonstrates the presence of significant treatment and disposal capacity, the Agency will continue to periodically collect and evaluate data to ensure that the requirements of CERCLA 104(c)(9) are satisfied.

National Capacity Assessment Tables

Table I:
1991 National Baseyear Data Representing Hazardous Waste Generated and Managed On Site

CAP Management Category	Waste Managed On Site
RECOVERY	
Metals Recovery	690,000
Inorganics Recovery	230,000
Organics Recovery	4,500,000
TREATMENT	
Stabilization/Chemical Fixation	170,000
Combustion - Pumpable	1,800,000
Combustion - Nonpumpable	240,000
Fuel Blending	270,000
Hazardous Wastewaters and Sludges Treatment	350,000,000
DISPOSAL	
Landfill	1,400,000
Deepwell/Underground Injection	24,000,000
Land Treatment/Farming	100,000
TRANSFER/STORAGE	
Transfer/Storage	

Table II:
1991 National Baseyear Data Representing Management of Hazardous Waste in Captive Systems

CAP Management Category	Waste Generated and Managed in Captive Systems
RECOVERY	
Metals Recovery	7,600
Inorganics Recovery	39,000
Organics Recovery	41,000
TREATMENT	
Stabilization/Chemical Fixation	2,400
Combustion - Pumpable	160,000
Combustion - Nonpumpable	230,000
Fuel Blending	14,000
Hazardous Wastewaters and Sludges Treatment	19,000,000
DISPOSAL	
Landfill	110,000
Deepwell/Underground Injection	94,000
Land Treatment/Farming	85,000
TRANSFER/STORAGE	
Transfer/Storage	

Table III:
1991 National Baseyear Data Representing Management of Hazardous Waste in Commercial Systems

CAP Management Category	Demand		Maximum Operational Commercial Subtitle C Management Capacity Available End of 1991
	Recurrent	One-time	
RECOVERY			
Metals Recovery	780,000	2,300	2,000,000
Inorganics Recovery	100,000	8,400	450,000
Organics Recovery	610,000	12,000	2,400,000
TREATMENT			
Stabilization/Chemical Fixation	480,000	80,000	5,100,000
Combustion - Pumpable	1,200,000	23,000	3,800,000
Combustion - Nonpumpable	250,000	27,000	1,100,000
Fuel Blending	750,000	28,000	4,200,000
Hazardous Wastewaters and Sludges Treatment	2,800,000	74,000	38,000,000
DISPOSAL			
Landfill	1,300,000	1,000,000	43,000,000
Deepwell/Underground Injection	860,000	12,000	3,300,000
Land Treatment/Farming	8,500	400	0
TRANSFER/STORAGE			
Transfer/Storage	2,000,000	3,100	

Table IV:
National Baseline and Projected Demand for Commercial Hazardous Waste Management Capacity

CAP Management Category	Baseline (1991)	Demand for Commercial Subtitle C Management Capacity					
		1993		1999		2013	
		Recurrent	One-time	Recurrent	One-time	Recurrent	One-time
RECOVERY							
Metals Recovery	800,000	820,000		800,000		800,000	
Inorganics Recovery	100,000	98,000		98,000		96,000	
Organics Recovery	610,000	610,000		610,000		610,000	
TREATMENT							
Stabilization/Chemical Fixation	500,000	610,000	370,000	610,000	820,000	610,000	790,000
Combustion - Pumpable	1,200,000	1,200,000		1,200,000		1,200,000	
Combustion - Nonpumpable	250,000	270,000	210,000	270,000	350,000	270,000	300,000
Fuel Blending	740,000	830,000		830,000		830,000	
Hazardous Wastewaters and Sludges Treatment	2,900,000	3,200,000		3,200,000		3,200,000	
DISPOSAL							
Landfill	1,600,000	1,600,000	240,000	1,600,000	280,000	1,600,000	230,000
Deepwell/Underground Injection	830,000	700,000		700,000		700,000	
Land Treatment/Farming	7,400						
TRANSFER/STORAGE							
Transfer/Storage	50,000						

Table V:
National Baseline and Projected Maximum Commercial Subtitle C Management Capacity

CAP Management Category	Baseline (1991)	Maximum In-state Commercial Subtitle C Management Capacity		
		1993	1999	2013
RECOVERY				
Metals Recovery	2,000,000	1,900,000	1,800,000	1,800,000
Inorganics Recovery	440,000	370,000	370,000	370,000
Organics Recovery	2,500,000	2,500,000	2,500,000	2,500,000
TREATMENT				
Stabilization/Chemical Fixation	6,100,000	8,000,000	8,100,000	8,100,000
Combustion - Pumpable	2,800,000	2,800,000	2,800,000	2,800,000
Combustion - Nonpumpable	1,100,000	1,100,000	1,300,000	1,300,000
Fuel Blending	4,200,000	4,300,000	4,300,000	4,300,000
Hazardous Wastewaters and Sludges Treatment	38,000,000	38,000,000	40,000,000	40,000,000
DISPOSAL				
Landfill	45,000,000	48,000,000	48,000,000	45,000,000
Deepwell/Underground Injection	3,300,000	3,300,000	3,300,000	3,300,000
Land Treatment/Farming	0			
TRANSFER/STORAGE				
Transfer/Storage				

Table VI:
National Capacity Assessment of Projected Remaining Commercial Subtitle C Capacity Not Utilized by Hazardous Wastes and Additional Demand Estimates Not Incorporated Into State-Submitted Data

CAP Management Category	Projected Remaining Commercial Subtitle C Capacity Not Utilized by Hazardous Waste (2013)	Estimated Additional Demand for Subtitle C Commercial Capacity			Assessment of the Continued Availability of Projected Subtitle C Commercial Capacity
		Land Disposal Restrictions (Phase II Rule)	*Small Quantity Generators*	*Non-RCRA Industrial Wastes*	
RECOVERY					
Metals Recovery	1,100,000	No Estimate	Negligible	42,000 (5%)	sufficient capacity
Inorganics Recovery	280,000	No Estimate	2,000 (2%)	No Estimate	sufficient capacity
Organics Recovery	1,900,000	No Estimate	8,000 (1%)	480,000 (35%)	sufficient capacity
TREATMENT					
Stabilization/Chemical Fixation	6,700,000	No Estimate	6,100 (1%)	19,000 (3%)	sufficient capacity
Combustion - Pumpable	1,800,000	11,000	12,000 (1%)	79,000 (6%)	sufficient capacity
Combustion - Nonpumpable	770,000	400,000	24,000 (4%)	36,000 (6%)	sufficient capacity
Fuel Blending	3,500,000	No Estimate	8,400 (1%)	No Estimate	sufficient capacity
Hazardous Wastewaters and Sludges Treatment	37,000,000	No Estimate	32,000 (1%)	2,000,000 (39%)	sufficient capacity
DISPOSAL					
Landfill	28,000,000	No Estimate	18,000 (1%) annually, 36,000 20-year total	460,000 (20%) annually, 9,200,000 20-year total	sufficient capacity
Deepwell/Underground Injection	2,600,000	No Estimate	Negligible	250,000 (26%)	sufficient capacity

References

Guidance for Capacity Assurance Planning, U.S. EPA, Office of Solid Waste and Emergency Response, OSWER Directive 9010.02, May 1993

One-Time Waste Estimates for Capacity Assurance Planning, U.S. EPA, Office of Solid Waste and Emergency Response, OSWER Directive 530-R-94-002, August 1994

Using Table Talk to Prepare CAP Tables, U.S. EPA, Office of Solid Waste and Emergency Response, OSWER, October 1992

Background Document for Capacity Analysis for Land Disposal Restrictions Phase II - Universal Treatment Standards, and Treatment Standards for Organic Toxicity Characteristic Wastes and Other Newly Listed Wastes, Office of Solid Waste and Emergency Response, August 1994

Hazardous Waste Treatment Council 1993 Survey of Commercial Hazardous Waste Incineration Capacity, in *Phase II Background Document* cited above

EI Digest, April 1993

Appendix A

Demand Data Submitted by States

The following tables show for each state the recurrent demand on commercial Subtitle C capacity for each CAP Management Category and each projection year. The data in these tables are directly from Table 5 in the states' CAPs.

Demand for Commercial Hazardous Waste Capacity from Recurrent Metals Recovery Expected to be Generated In State (tons)

State	Baseline	Demand for Commercial Subtitle C Management Capacity			State	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	12,110	12,869	12,869	12,869	New Hampshire	2,702	2,758	2,630	2,630
Arkansas	17,995	17,995	17,995	17,995	New Jersey	29,237	35,561	35,561	35,561
Connecticut	4,101	4,133	4,133	4,133	New Mexico	48	50	50	50
Delaware	4,952	5,061	5,061	5,061	New York	18,310	18,560	18,560	18,560
District of Columbia	1	2	2	2	North Carolina	3,984	4,084	4,084	4,084
Florida	15,672	15,683	15,683	15,683	Ohio	50,441	50,912	50,912	50,912
Georgia	8,591	9,360	9,360	9,360	Oklahoma	44,824	44,824	44,824	44,824
Illinois	31,097	46,709	46,709	46,709	Pennsylvania	111,334	111,338	111,338	111,338
Indiana	41,915	41,916	41,916	41,916	Puerto Rico	47,110	47,118	47,118	47,118
Iowa	1,716	1,716	1,716	1,716	Rhode Island	2,329	2,425	2,425	2,425
Kentucky	10,828	10,828	10,828	10,828	South Carolina	12,891	12,892	12,892	12,892
Louisiana	13,260	13,578	13,578	13,578	Tennessee	37,620	37,642	37,642	37,642
Maine	542	542	542	542	Texas	74,800	75,800	75,800	75,800
Maryland	3,366	3,435	3,435	3,435	Vermont	25,184	25,280	244	244
Massachusetts	3,467	3,467	3,467	3,467	Virgina	8,996	8,996	8,996	8,996
Michigan	19,469	19,694	19,694	19,694	West Virginia	1,398	1,475	1,475	1,475
Minnesota	17,142	17,234	17,234	17,234	Wisconsin	1,945	1,972	1,972	1,972
Mississippi	511	511	511	511	Western States	102,077	102,996	102,996	102,996
Missouri	13,923	13,945	13,945	13,945					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA and WY.

Demand for Commercial Hazardous Waste Capacity from Recurrent Inorganics Recovery Expected to be Generated In State (tons)

State	Baseline	Demand for Commercial Subtitle C Management Capacity			State	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	644	827	827	827	New Hampshire	346	347	347	347
Arkansas	333	334	334	334	New Jersey	1,422	1,422	1,422	1,422
Connecticut	4,901	4,901	4,901	4,901	New Mexico	34	34	34	34
Delaware	3	3	3	3	New York	460	460	460	460
District of Columbia	5	37	37	37	North Carolina	52	52	52	52
Florida	505	511	511	511	Ohio	11,786	11,786	11,786	11,786
Georgia	799	814	814	814	Oklahoma	457	457	457	457
Illinois	14,702	9,645	9,645	9,645	Pennsylvania	338	338	338	338
Indiana	19,071	19,071	19,071	19,071	Puerto Rico	117	117	117	117
Iowa	10	10	10	10	Rhode Island	2	2	2	2
Kentucky	62	62	62	62	South Carolina	118	118	118	118
Louisiana	32	32	32	32	Tennessee	0	0	0	0
Maine	27	27	27	27	Texas	1,650	1,650	1,650	1,650
Maryland	459	609	609	609	Vermont	0	0	0	0
Massachusetts	724	724	724	724	Virgina	140	140	140	140
Michigan	13,583	13,583	13,583	13,583	West Virginia	337	337	337	337
Minnesota	222	222	222	222	Wisconsin	153	153	153	153
Mississippi	3	3	3	3	Western States	27,124	27,131	27,131	27,131
Missouri	301	313	313	313					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Demand for Commercial Hazardous Waste Capacity from Recurrent Organics Recovery Expected to be Generated In State (tons)

State	Baseline	Demand for Commercial Subtitle C Management Capacity			State	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	5,725	5,725	5,725	5,725	New Hampshire	448	634	632	632
Arkansas	1,804	1,804	1,804	1,804	New Jersey	56,975	56,975	56,975	56,975
Connecticut	2,805	3,140	3,140	3,140	New Mexico	169	211	211	211
Delaware	4,260	4,260	4,260	4,260	New York	12,750	12,720	12,720	12,720
District of Columbia	8	8	8	8	North Carolina	5,726	5,726	5,726	5,726
Florida	23,117	23,157	23,157	23,157	Ohio	39,590	39,729	39,729	39,729
Georgia	6,624	6,650	6,650	6,650	Oklahoma	7,081	7,081	7,081	7,081
Illinois	36,138	32,247	32,247	32,247	Pennsylvania	18,573	18,573	18,573	18,573
Indiana	18,667	18,667	18,667	18,667	Puerto Rico	6,338	6,338	6,338	6,338
Iowa	2,304	2,375	2,375	2,375	Rhode Island	235	235	236	236
Kentucky	7,968	7,968	7,968	7,968	South Carolina	10,483	10,483	10,483	10,483
Louisiana	17,095	17,207	17,207	17,207	Tennessee	3,381	3,435	3,435	3,435
Maine	1,115	1,115	1,115	1,115	Texas	50,300	50,500	50,500	50,500
Maryland	3,089	3,405	3,405	3,405	Vermont	1,264	1,413	1,413	1,413
Massachusetts	28,560	28,560	28,560	28,560	Virgina	3,472	3,472	3,472	3,472
Michigan	58,954	58,954	58,954	58,954	West Virginia	3,031	3,031	3,031	3,031
Minnesota	6,245	6,245	6,245	6,245	Wisconsin	12,509	12,509	12,509	12,509
Mississippi	2,872	2,872	2,872	2,872	Western States	142,182	143,579	143,579	143,579
Missouri	8,848	8,878	8,878	8,878					

• Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Demand for Commercial Hazardous Waste Capacity from Recurrent Energy Recovery - Liquids Expected to be Generated In State (tons)

State	Baseline	Demand for Commercial Subtitle C Management Capacity			State	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	56,918	56,918	56,918	56,918	New Hampshire	125	580	577	577
Arkansas	19,193	19,194	19,194	19,194	New Jersey	93,244	93,244	93,244	93,244
Connecticut	12,258	13,202	13,202	13,202	New Mexico	137	137	137	137
Delaware	176	176	176	176	New York	3,680	3,990	3,990	3,990
District of Columbia	0	0	0	0	North Carolina	15,062	15,062	15,062	15,062
Florida	11,790	11,963	11,963	11,963	Ohio	79,714	79,714	79,714	79,714
Georgia	6,378	6,392	6,392	6,392	Oklahoma	11,343	11,343	11,343	11,343
Illinois	68,183	37,734	37,734	37,734	Pennsylvania	14,737	14,737	14,737	14,737
Indiana	44,516	44,516	44,516	44,516	Puerto Rico	1,549	1,549	1,549	1,549
Iowa	378	378	378	378	Rhode Island	938	938	938	938
Kentucky	61,959	61,959	61,959	61,959	South Carolina	26,764	26,764	26,764	26,764
Louisiana	32,504	32,504	32,504	32,504	Tennessee	744	744	744	744
Maine	359	359	359	359	Texas	96,300	102,000	102,000	102,000
Maryland	877	879	879	879	Vermont	15	51	51	51
Massachusetts	1,815	1,815	1,815	1,815	Virgina	7,388	7,388	7,388	7,388
Michigan	56,651	56,651	56,651	56,651	West Virginia	336	336	336	336
Minnesota	1,007	1,007	1,007	1,007	Wisconsin	48,061	48,061	48,061	48,061
Mississippi	1,599	1,607	1,607	1,607	Western States	78,848	78,989	78,989	78,989
Missouri	135,806	135,832	135,832	135,832					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Demand for Commercial Hazardous Waste Capacity from Recurrent Energy Recovery - Sludges/Solids Expected to be Generated In State (tons)

State	Baseline	Demand for Commercial Subtitle C Management Capacity			State	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	1,656	1,656	1,556	1,556	New Hampshire	102	102	102	102
Arkansas	35	36	36	36	New Jersey	3,800	3,800	3,800	3,800
Connecticut	807	807	807	807	New Mexico	7	7	7	7
Delaware	458	458	458	458	New York	390	340	340	340
District of Columbia	0	0	0	0	North Carolina	130	130	130	130
Florida	158	170	170	170	Ohio	7,132	7,154	7,154	7,154
Georgia	3,419	3,755	3,755	3,755	Oklahoma	5,383	5,383	5,383	5,383
Illinois	13,955	2,589	2,589	2,589	Pennsylvania	1,329	1,329	1,329	1,329
Indiana	740	740	740	740	Puerto Rico	15	15	15	15
Iowa	129	129	129	129	Rhode Island	30	30	30	30
Kentucky	5,081	5,081	5,081	5,081	South Carolina	532	532	532	532
Louisiana	9,905	9,905	9,905	9,905	Tennessee	193	193	193	193
Maine	29	29	29	29	Texas	13,200	19,600	19,600	19,600
Maryland	27	31	31	31	Vermont	35	619	619	619
Massachusetts	376	376	376	376	Virgina	94	94	94	94
Michigan	953	953	953	953	West Virginia	384	384	384	384
Minnesota	147	147	147	147	Wisconsin	8,088	8,088	8,088	8,088
Mississippi	83	83	83	83	Western States	7,238	7,246	7,246	7,246
Missouri	4,580	4,580	4,580	4,580					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Demand for Commercial Hazardous Waste Capacity from Recurrent Stabilization - Chemical Fixation Expected to be Generated In State (tons)

State	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013
Alabama	4,348	4,525	4,525	4,525
Arkansas	1,050	1,050	1,050	1,050
Connecticut	13,738	13,741	13,741	13,741
Delaware	340	340	340	340
District of Columbia	59	59	59	59
Florida	3,779	3,935	3,935	3,935
Georgia	3,536	4,571	4,571	4,571
Illinois	32,742	23,711	23,711	23,711
Indiana	14,923	100,791	100,791	100,791
Iowa	1,814	1,844	1,844	1,844
Kentucky	6,203	6,203	6,203	6,203
Louisiana	5,184	16,413	16,413	16,413
Maine	4,008	4,008	4,008	4,008
Maryland	1,251	1,310	1,310	1,310
Massachusetts	12,274	12,274	12,274	12,274
Michigan	45,412	46,757	46,757	46,757
Minnesota	3,330	3,403	3,403	3,403
Mississippi	1,421	1,430	1,430	1,430
Missouri	1,164	1,192	1,192	1,192

State	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013
New Hampshire	1,046	1,140	1,139	1,139
New Jersey	48,861	52,270	52,270	52,270
New Mexico	26	26	26	26
New York	24,210	24,240	24,240	24,240
North Carolina	1,695	2,007	2,007	2,007
Ohio	45,137	46,558	46,558	46,558
Oklahoma	987	1,153	1,153	1,153
Pennsylvania	49,102	51,228	51,228	51,228
Puerto Rico	96	109	109	109
Rhode Island	4,842	5,036	5,036	5,036
South Carolina	19,676	19,824	19,824	19,824
Tennessee	3,723	3,901	3,901	3,901
Texas	67,700	70,200	70,200	70,200
Vermont	149	1,281	1,281	1,281
Virgina	2,454	2,674	2,674	2,674
West Virginia	1,609	7,086	7,086	7,086
Wisconsin	5,087	5,106	5,106	5,106
Western States	64,565	72,019	72,019	72,019

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Demand for Commercial Hazardous Waste Capacity from Recurrent Incineration - Liquids/Gases Expected to be Generated In State (tons)

State	Baseline	Demand for Commercial Subtitle C Management Capacity			State	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	5,161	5,161	4,234	4,234	New Hampshire	360	832	820	820
Arkansas	890	1,828	1,828	1,828	New Jersey	17,168	17,168	17,168	17,168
Connecticut	4,591	4,593	4,593	4,593	New Mexico	396	400	400	400
Delaware	1,836	1,836	1,836	1,836	New York	7,910	8,020	8,020	8,020
District of Columbia	130	155	155	155	North Carolina	4,565	4,565	4,565	4,565
Florida	694	822	822	822	Ohio	22,567	28,362	28,362	28,362
Georgia	8,108	8,323	8,323	8,323	Oklahoma	277	277	277	277
Illinois	4,718	7,354	7,354	7,354	Pennsylvania	13,059	13,059	13,059	13,059
Indiana	5,541	5,790	5,790	5,790	Puerto Rico	11,316	11,317	11,317	11,317
Iowa	895	930	930	930	Rhode Island	1,038	1,038	1,038	1,038
Kentucky	6,348	6,348	6,348	6,348	South Carolina	5,032	5,358	5,358	5,358
Louisiana	5,423	5,423	5,423	5,423	Tennessee	3,162	3,170	3,170	3,170
Maine	903	903	903	903	Texas	61,900	61,900	61,900	61,900
Maryland	2,440	4,878	4,878	4,878	Vermont	229	513	513	513
Massachusetts	3,647	3,647	3,646	3,646	Virgina	2,913	2,928	2,928	2,928
Michigan	3,677	3,677	3,677	3,677	West Virginia	9,928	10,396	10,396	10,396
Minnesota	942	942	942	942	Wisconsin	5,678	5,678	5,678	5,678
Mississippi	3,091	3,091	3,091	3,091	Western States	15,717	15,980	15,980	15,980
Missouri	5,476	5,500	5,500	5,500					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Demand for Commercial Hazardous Waste Capacity from Recurrent Incineration - Sludges/Solids Expected to be Generated In State (tons)

State	Baseline	Demand for Commercial Subtitle C Management Capacity			State	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	1,863	1,863	1,706	1,706	New Hampshire	268	565	564	564
Arkansas	497	497	497	497	New Jersey	9,896	9,896	9,896	9,896
Connecticut	1,613	1,725	1,725	1,725	New Mexico	1,021	1,021	1,021	1,021
Delaware	859	859	859	859	New York	3,150	3,320	3,320	3,320
District of Columbia	32	42	42	42	North Carolina	1,770	1,770	1,770	1,770
Florida	756	821	821	821	Ohio	6,286	6,539	6,539	6,539
Georgia	1,791	2,350	2,350	2,350	Oklahoma	1,714	1,714	1,714	1,714
Illinois	6,792	18,030	18,030	18,030	Pennsylvania	5,861	8,099	8,099	8,099
Indiana	8,855	8,934	8,934	8,934	Puerto Rico	3,629	3,629	3,629	3,629
Iowa	161	179	179	179	Rhode Island	279	279	279	279
Kentucky	2,567	2,567	2,567	2,567	South Carolina	4,045	4,045	4,045	4,045
Louisiana	8,984	9,371	9,371	9,371	Tennessee	434	457	457	457
Maine	147	147	147	147	Texas	43,700	46,800	46,800	46,800
Maryland	3,775	4,384	4,879	4,879	Vermont	660	929	929	929
Massachusetts	2,439	2,439	2,439	2,439	Virgina	5,137	5,137	5,137	5,137
Michigan	4,010	4,010	4,010	4,010	West Virginia	1,043	1,043	1,043	1,043
Minnesota	985	1,001	1,001	1,001	Wisconsin	1,191	1,191	1,191	1,191
Mississippi	1,030	1,047	1,047	1,047	Western States	23,794	24,774	24,774	24,774
Missouri	1,182	1,755	1,755	1,755					

• Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Demand for Commercial Hazardous Waste Capacity from Recurrent Fuel Blending Expected to be Generated In State (tons)

State	Baseline	Demand for Commercial Subtitle C Management Capacity			State	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	100,236	100,236	99,853	99,853	New Hampshire	828	1,061	1,059	1,059
Arkansas	9,579	9,579	9,579	9,579	New Jersey	93,518	93,518	93,518	93,518
Connecticut	11,907	11,907	11,907	11,907	New Mexico	699	714	714	714
Delaware	1,345	1,345	1,345	1,345	New York	13,960	13,860	13,860	13,860
District of Columbia	0	12	12	12	North Carolina	10,310	10,310	10,310	10,310
Florida	6,537	6,660	6,660	6,660	Ohio	34,218	34,668	34,668	34,668
Georgia	17,714	17,749	17,749	17,749	Oklahoma	2,524	2,524	2,524	2,524
Illinois	27,634	103,903	103,903	103,903	Pennsylvania	25,754	25,754	25,754	25,754
Indiana	52,924	52,924	52,924	52,924	Puerto Rico	13,322	13,322	13,322	13,322
Iowa	6,627	6,645	6,645	6,645	Rhode Island	848	848	848	848
Kentucky	10,382	10,382	10,382	10,382	South Carolina	9,421	9,421	9,421	9,421
Louisiana	15,226	15,226	15,226	15,226	Tennessee	11,791	11,988	11,988	11,988
Maine	752	752	752	752	Texas	74,900	80,600	80,600	80,600
Maryland	3,289	4,107	4,107	4,107	Vermont	890	1,081	1,081	1,081
Massachusetts	5,001	5,001	5,001	5,001	Virgina	5,420	5,420	5,420	5,420
Michigan	61,656	61,656	61,656	61,656	West Virginia	4,756	4,756	4,756	4,756
Minnesota	3,440	3,440	3,440	3,440	Wisconsin	46,928	46,928	46,928	46,928
Mississippi	5,983	5,983	5,983	5,983	Western States	27,572	29,560	29,560	29,560
Missouri	24,810	24,851	24,851	24,851					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Demand for Commercial Hazardous Waste Capacity from Recurrent Hazardous Wastewaters and Sludges Treatment Expected to be Generated In State (tons)

State	Baseline	Demand for Commercial Subtitle C Management Capacity			State	Buseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	8,696	68,747	68,747	68,747	New Hampshire	1,041	2,452	2,372	2,372
Arkansas	602	1,532	1,532	1,532	New Jersey	1,033,620	1,033,620	1,033,620	1,033,620
Connecticut	21,949	30,992	30,992	30,992	New Mexico	181	390	390	390
Delaware	2,299	2,396	2,396	2,396	New York	118,060	119,960	119,960	119,960
District of Columbia	71	77	77	77	North Carolina	8,109	8,453	8,453	8,453
Florida	2,800	3,591	3,591	3,591	Ohio	195,257	200,241	200,241	200,241
Georgia	5,372	7,923	7,923	7,923	Oklahoma	8,509	27,911	27,911	27,911
Illinois	119,128	142,511	142,511	142,511	Pennsylvania	203,348	204,513	204,513	204,513
Indiana	202,578	263,181	263,181	263,181	Puerto Rico	410,780	410,837	410,837	410,837
Iowa	3,529	3,529	3,529	3,529	Rhode Island	3,238	3,344	3,344	3,344
Kentucky	11,201	11,201	11,201	11,201	South Carolina	33,266	34,087	34,087	34,087
Louisiana	2,516	11,151	11,151	11,151	Tennessee	19,144	19,225	19,225	19,225
Maine	904	909	909	909	Texas	11,800	11,800	11,800	11,800
Maryland	25,690	28,095	28,095	28,095	Vermont	849	1,307	1,307	1,307
Massachusetts	15,141	15,141	15,141	15,141	Virgina	8,720	8,960	8,960	8,960
Michigan	118,161	119,643	119,643	119,643	West Virginia	11,782	11,857	11,857	11,857
Minnesota	9,280	9,326	9,326	9,326	Wisconsin	86,886	87,186	87,186	87,186
Mississippi	12,223	12,223	12,223	12,223	Western States	185,210	211,484	211,484	211,484
Missouri	28,925	30,337	30,337	30,337					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Demand for Commercial Hazardous Waste Capacity from Recurrent Landfill Expected to be Generated In State (tons)

State	Baseline	Demand for Commercial Subtitle C Management Capacity			State	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	22,479	16,536	16,361	16,361	New Hampshire	3,198	2,646	2,635	2,635
Arkansas	46,800	46,800	46,800	46,800	New Jersey	171,338	176,449	176,449	176,449
Connecticut	29,253	21,713	21,713	21,713	New Mexico	770	584	584	584
Delaware	2,249	2,044	2,044	2,044	New York	57,010	57,290	57,290	57,290
District of Columbia	116	125	125	125	North Carolina	9,019	8,732	8,732	8,732
Florida	11,151	11,435	11,435	11,435	Ohio	106,308	104,101	104,101	104,101
Georgia	16,437	14,073	14,073	14,073	Oklahoma	3,199	3,448	3,448	3,448
Illinois	87,518	64,213	64,213	64,213	Pennsylvania	61,452	63,235	63,235	63,235
Indiana	7,981	47,502	47,502	47,502	Peurto Rico	2,050	1,985	1,985	1,985
Iowa	6,537	6,593	6,593	6,593	Rhode Island	8,322	8,322	8,322	8,322
Kentucky	24,671	24,671	24,671	24,671	South Carolina	39,662	39,662	39,662	39,662
Louisiana	30,103	26,435	26,435	26,435	Tennessee	22,055	22,329	22,329	22,329
Maine	6,180	6,180	6,180	6,180	Texas	160,000	161,000	161,000	161,000
Maryland	3,635	4,480	4,480	4,480	Vermont	3,643	5,516	5,516	5,516
Massachusetts	26,912	26,912	26,912	26,912	Virgina	9,777	9,412	9,412	9,412
Michigan	85,399	85,799	85,799	85,799	West Virginia	13,696	21,357	21,357	21,357
Minnesota	15,999	15,889	15,889	15,889	Wisconsin	11,190	11,071	11,071	11,071
Mississippi	5,655	5,245	5,245	5,245	Western States	483,998	483,082	483,082	483,082
Missouri	11,459	10,560	10,560	10,560					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Demand for Commercial Hazardous Waste Capacity from Recurrent Deepwell - Underground Injection Expected to be Generated In State (tons)

State	Baseline	Demand for Commercial Subtitle C Management Capacity			State	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	58,924	843	843	843	New Hampshire	0	0	0	0
Arkansas	5,516	5,517	5,517	5,517	New Jersey	0	0	0	0
Connecticut	100	0	0	0	New Mexico	7	1	1	1
Delaware	0	0	0	0	New York	480	440	440	440
District of Columbia	0	0	0	0	North Carolina	0	0	0	0
Florida	631	6	6	6	Ohio	158,883	157,767	157,767	157,767
Georgia	1,794	1,794	1,794	1,794	Oklahoma	3,052	2,784	2,784	2,784
Illinois	5,847	0	0	0	Pennsylvania	2,952	1,787	1,787	1,787
Indiana	57,681	742	742	742	Puerto Rico	3	3	3	3
Iowa	360	360	360	360	Rhode Island	0	0	0	0
Kentucky	3,292	3,292	3,292	3,292	South Carolina	177	177	177	177
Louisiana	108,529	108,529	108,529	108,529	Tennessee	429	344	344	344
Maine	0	0	0	0	Texas	397,400	397,400	397,400	397,400
Maryland	94	709	709	709	Vermont	0	0	0	0
Massachusetts	1	1	1	1	Virgina	524	520	520	520
Michigan	4,679	3,197	3,197	3,197	West Virginia	245	245	245	245
Minnesota	0	0	0	0	Wisconsin	179	0	0	0
Mississippi	2,846	320	320	320	Western States	14,796	12,447	12,447	12,447
Missouri	959	23	23	23					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Appendix B

Commercial Capacity Data Submitted by States

The following tables show for each state the quantities of commercial Subtitle C management capacity for each CAP Management Category and each projection year. The data in these tables are directly from Table 6 in the States' CAPs.

Expected Maximum Commercial Subtitle C Management Capacity for Metals Recovery (tons)

State	Baseline	Commercial Subtitle C Management Capacity			State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	100,000	20,000	20,000	20,000	New Hampshire	0	0	0	0
Arkansas	0	0	0	0	New Jersey	670	670	670	670
Connecticut	1,454	550	550	550	New Mexico	5,929	5,929	5,929	5,929
Delaware	0	200	200	200	New York	27,520	27,520	27,520	27,520
District of Columbia	0	0	0	0	North Carolina	0	0	0	0
Florida	208	208	208	208	Ohio	11,000	11,000	11,000	11,000
Georgia	0	0	0	0	Oklahoma	0	0	0	0
Illinois	117,201	164,202	164,202	164,202	Pennsylvania	420,597	420,597	320,597	320,597
Indiana	202,400	202,400	202,400	202,400	Puerto Rico	0	0	0	0
Iowa	0	0	0	0	Rhode Island	31,288	31,288	31,288	31,288
Kentucky	41	41	41	41	South Carolina	2,171	2,171	2,171	2,171
Louisiana	378,040	378,040	378,040	378,040	Tennessee	233,875	129,625	129,625	129,625
Maine	0	0	0	0	Texas	240,800	305,600	305,600	305,600
Maryland	0	0	0	0	Vermont	0	0	0	0
Massachusetts	5,453	5,453	5,453	5,453	Virgina	0	0	0	0
Michigan	30	30	30	30	West Virginia	0	0	0	0
Minnesota	65,694	65,694	65,694	65,694	Wisconsin	120	120	120	120
Mississippi	0	0	0	0	Western States	99,968	100,563	150,563	150,563
Missouri	7,225	7,225	7,225	7,225					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Expected Maximum Commercial Subtitle C Management Capacity for Inorganics Recovery (tons)

State	Baseline	Commercial Subtitle C Management Capacity			State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	0	0	0	0	New Hampshire	0	0	0	0
Arkansas	0	0	0	0	New Jersey	0	0	0	0
Connecticut	11	11	11	11	New Mexico	0	0	0	0
Delaware	0	0	0	0	New York	0	0	0	0
District of Columbia	0	0	0	0	North Carolina	0	0	0	0
Florida	0	0	0	0	Ohio	41,731	41,731	41,731	41,731
Georgia	0	0	0	0	Oklahoma	0	0	0	0
Illinois	0	0	0	0	Pennsylvania	0	0	0	0
Indiana	0	0	0	0	Puerto Rico	0	0	0	0
Iowa	0	0	0	0	Rhode Island	6,924	6,924	6,924	6,924
Kentucky	3,375	3,375	3,375	3,375	South Carolina	0	0	0	0
Louisiana	0	0	0	0	Tennessee	0	0	0	0
Maine	0	0	0	0	Texas	0	0	0	0
Maryland	0	0	0	0	Vermont	0	0	0	0
Massachusetts	0	0	0	0	Virgina	0	0	0	0
Michigan	117,624	117,624	117,624	117,624	West Virginia	0	0	0	0
Minnesota	0	0	0	0	Wisconsin	0	0	0	0
Mississippi	0	0	0	0	Western States	271,840	197,590	197,590	197,590
Missouri	1,000	1,000	1,000	1,000					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Expected Maximum Commercial Subtitle C Management Capacity for Organics Recovery (tons)

State	Baseline	Commercial Subtitle C Management Capacity			State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	17,406	15,000	15,000	15,000	New Hampshire	0	0	0	0
Arkansas	4,600	4,600	4,600	4,600	New Jersey	74,935	74,935	74,935	74,935
Connecticut	7,744	7,744	7,744	7,744	New Mexico	0	0	0	0
Delaware	0	0	0	0	New York	1,900	1,900	1,900	1,900
District of Columbia	0	0	0	0	North Carolina	1,814	1,814	1,814	1,814
Florida	237,834	232,025	232,025	232,025	Ohio	147,835	156,657	156,657	156,657
Georgia	31,140	29,433	18,183	18,183	Oklahoma	48,678	48,678	48,678	48,678
Illinois	80,966	114,280	114,280	114,280	Pennsylvania	17,100	17,100	17,100	17,100
Indiana	201,283	201,283	201,283	201,283	Puerto Rico	14,875	14,875	14,875	14,875
Iowa	370	370	370	370	Rhode Island	13,623	13,623	13,623	13,623
Kentucky	52,040	52,040	52,040	52,040	South Carolina	42,004	42,004	42,004	42,004
Louisiana	55,000	55,000	55,000	55,000	Tennessee	20,020	20,020	20,020	20,020
Maine	0	0	0	0	Texas	133,500	137,800	137,800	137,800
Maryland	403	403	0	0	Vermont	0	0	0	0
Massachusetts	79,585	79,585	79,585	79,585	Virgina	8,765	46,765	46,765	46,765
Michigan	711,866	664,282	664,282	664,282	West Virginia	0	0	0	0
Minnesota	600	600	600	600	Wisconsin	73,071	73,071	73,071	73,071
Mississippi	0	0	0	0	Western States	338,480	320,263	320,263	320,263
Missouri	74,500	69,400	69,400	69,400					

• Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Expected Maximum Commercial Subtitle C Management Capacity for Energy Recovery - Liquids (tons)

State	Baseline	Commercial Subtitle C Management Capacity			State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	65,000	65,000	65,000	65,000	New Hampshire	0	0	0	0
Arkansas	12,569	12,570	12,570	12,570	New Jersey	0	0	0	0
Connecticut	4,053	4,053	4,053	4,053	New Mexico	0	0	0	0
Delaware	0	0	0	0	New York	37,480	37,480	37,480	37,480
District of Columbia	0	0	0	0	North Carolina	40,201	12,978	34,930	45,906
Florida	39,351	39,351	39,351	39,351	Ohio	85,640	85,640	85,640	85,640
Georgia	0	0	80,200	80,200	Oklahoma	0	0	0	0
Illinois	0	0	0	0	Pennsylvania	96,321	96,321	96,321	96,321
Indiana	158,048	158,048	158,048	158,048	Puerto Rico	0	0	0	0
Iowa	0	0	0	0	Rhode Island	0	0	0	0
Kentucky	54,896	54,896	54,896	54,896	South Carolina	148,920	148,920	148,920	148,920
Louisiana	177,300	177,300	177,300	177,300	Tennessee	5,667	5,667	5,667	5,667
Maine	0	0	0	0	Texas	351,000	250,800	250,800	250,800
Maryland	0	0	0	0	Vermont	0	0	0	0
Massachusetts	0	0	0	0	Virgina	70,000	70,000	70,000	70,000
Michigan	157,620	52,500	52,500	52,500	West Virginia	0	0	0	0
Minnesota	0	0	0	0	Wisconsin	0		0	0
Mississippi	62	6,170	6,170	6,170	Western States	358,704	358,704	358,704	358,704
Missouri	165,470	245,470	245,470	245,470					

• Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Expected Maximum Commercial Subtitle C Management Capacity for Energy Recovery - Sludges/Solids (tons)

State	Baseline	Commercial Subtitle C Management Capacity			State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	0	0	0	0	New Hampshire	0	0	0	0
Arkansas	194,000	194,000	194,000	194,000	New Jersey	0	0	0	0
Connecticut	0	0	0	0	New Mexico	0	0	0	0
Delaware	0	0	0	0	New York	0	0	0	0
District of Columbia	0	0	0	0	North Carolina	0	0	0	0
Florida	0	0	0	0	Ohio	1,010	1,010	1,010	1,010
Georgia	0	0	0	0	Oklahoma	0	0	0	0
Illinois	0	0	0	0	Pennsylvania	0	0	0	0
Indiana	0	0	0	0	Puerto Rico	0	0	0	0
Iowa	0	0	0	0	Rhode Island	0	0	0	0
Kentucky	0	0	0	0	South Carolina	1,041	1,041	1,041	1,041
Louisiana	228,338	228,338	228,338	228,338	Tennessee	11,505	11,505	11,505	11,505
Maine	0	0	0	0	Texas	0	10,700	10,700	10,700
Maryland	0	0	0	0	Vermont	0	0	0	0
Massachusetts	0	0	0	0	Virgina	0	0	0	0
Michigan	0	0	0	0	West Virginia	0	0	0	0
Minnesota	0	0	0	0	Wisconsin	0	0	0	0
Mississippi	0	0	0	0	Western States	119,524	119,524	119,524	119,524
Missouri	30,555	30,555	30,555	30,555					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Expected Maximum Commercial Subtitle C Management Capacity for Stabilization/Chemical Fixation (tons)

State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013
Alabama	52,000	483,600	483,600	483,600
Arkansas	1,050	1,050	1,050	1,050
Connecticut	41,371	41,371	41,371	41,371
Delaware	0	0	0	0
District of Columbia	0	0	0	0
Florida	0	0	0	0
Georgia	66,463	67,136	116,908	116,908
Illinois	230,900	230,900	230,900	230,900
Indiana	460,867	460,867	460,867	460,867
Iowa	0	0	0	0
Kentucky	120,000	120,000	120,000	120,000
Louisiana	310,700	310,700	310,700	310,700
Maine	0	0	0	0
Maryland	0	0	0	0
Massachusetts	0	0	0	0
Michigan	457,580	457,580	457,580	457,580
Minnesota	0	0	0	0
Mississippi	0	0	0	0
Missouri	0	0	0	0
New Hampshire	0	0	0	0
New Jersey	35,153	35,153	35,153	35,153
New Mexico	0	0	0	0
New York	125,070	125,070	125,070	125,070
North Carolina	0	0	0	0
Ohio	281,580	431,580	431,580	431,580
Oklahoma	952,875	952,875	952,875	952,875
Pennsylvania	85,418	85,418	85,418	85,418
Puerto Rico	0	0	0	0
Rhode Island	0	0	0	0
South Carolina	117,000	117,000	117,000	117,000
Tennessee	0	0	0	0
Texas	1,215,000	1,215,000	1,215,000	1,215,000
Vermont	0	0	0	0
Virgina	0	0	0	0
West Virginia	0	0	0	0
Wisconsin	109,500	109,500	109,500	109,500
Western States	1,413,744	2,756,962	2,756,962	2,756,962

• Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Expected Maximum Commercial Subtitle C Management Capacity for Incineration - Liquids/Gases (tons)

State	Baseline	Commercial Subtitle C Management Capacity			State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	0	0	0	0	New Hampshire	0	0	0	0
Arkansas	192,000	192,000	192,000	192,000	New Jersey	46,566	46,566	46,566	46,566
Connecticut	0	0	0	0	New Mexico	0	0	0	0
Delaware	0	0	0	0	New York	40	40	40	40
District of Columbia	0	0	0	0	North Carolina	0	0	0	0
Florida	0	0	0	0	Ohio	56,502	72,702	72,702	72,702
Georgia	0	0	0	0	Oklahoma	2,000	2,000	2,000	2,000
Illinois	74,964	51,156	51,156	51,156	Pennsylvania	0	0	0	0
Indiana	0	0	0	0	Puerto Rico	0	0	0	0
Iowa	0	0	0	0	Rhode Island	0	0	0	0
Kentucky	100,000	100,000	100,000	100,000	South Carolina	23,765	23,765	23,765	23,765
Louisiana	1,315,697	1,315,697	1,315,697	1,315,697	Tennessee	0	0	0	0
Maine	0	0	0	0	Texas	201,400	201,400	201,400	201,400
Maryland	0	0	0	0	Vermont	0	0	0	0
Massachusetts	0	0	0	0	Virgina	0	0	0	0
Michigan	0	0	0	0	West Virginia	0	0	0	0
Minnesota	0	0	0	0	Wisconsin	3,184	3,184	3,184	3,184
Mississippi	0	0	0	0	Western States	37,697	33,947	110,058	110,058
Missouri	0	0	0	0					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Expected Maximum Commercial Subtitle C Management Capacity for Incineration - Sludges/Solids (tons)

State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013
Alabama	3,800	3,800	3,800	3,800
Arkansas	96,000	96,000	195,840	195,840
Connecticut	0	0	0	0
Delaware	0	0	0	0
District of Columbia	0	0	0	0
Florida	0	0	0	0
Georgia	0	0	0	0
Illinois	92,092	73,500	73,500	73,500
Indiana	0	0	0	0
Iowa	0	0	0	0
Kentucky	200,000	200,000	200,000	200,000
Louisiana	488,839	488,839	488,839	488,839
Maine	0	0	0	0
Maryland	0	0	0	0
Massachusetts	0	0	0	0
Michigan	0	0	0	0
Minnesota	0	0	0	0
Mississippi	0	0	0	0
Missouri	3,072	0	0	0
New Hampshire	0	0	0	0
New Jersey	31,451	31,451	31,451	31,451
New Mexico	0	0	0	0
New York	420	420	420	420
North Carolina	0	0	0	0
Ohio	33,376	77,176	77,176	77,176
Oklahoma	0	0	0	0
Pennsylvania	0	0	0	0
Puerto Rico	0	0	0	0
Rhode Island	0	0	0	0
South Carolina	19,500	19,500	19,500	19,500
Tennessee	0	0	0	0
Texas	161,600	161,600	161,600	161,600
Vermont	0	0	0	0
Virgina	0	0	0	0
West Virginia	0	0	0	0
Wisconsin	0	0	0	0
Western States	85,733	85,733	179,622	179,622

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Expected Maximum Commercial Subtitle C Management Capacity for Fuel Blending (tons)

State	Baseline	Commercial Subtitle C Management Capacity			State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	342,277	320,957	320,957	320,957	New Hampshire	0	0	0	0
Arkansas	334,384	334,400	334,400	334,400	New Jersey	94,207	94,207	94,207	94,207
Connecticut	203,051	203,051	203,051	203,051	New Mexico	0	0	0	0
Delaware	0	0	0	0	New York	4,050	4,050	4,050	4,050
District of Columbia	0	0	0	0	North Carolina	2,281	2,281	2,281	2,281
Florida	49,912	49,912	49,912	49,912	Ohio	114,940	202,379	202,379	202,379
Georgia	270,318	269,100	205,040	205,040	Oklahoma	205,242	205,242	205,242	205,242
Illinois	134,755	145,975	145,975	145,975	Pennsylvania	75,894	75,894	75,894	75,894
Indiana	185,752	185,752	185,752	185,752	Puerto Rico	126,347	126,347	126,347	126,347
Iowa	0	0	0	0	Rhode Island	0	0	0	0
Kentucky	168,626	168,626	168,626	168,626	South Carolina	11,547	11,547	11,547	11,547
Louisiana	686,200	686,200	686,200	686,200	Tennessee	84,471	84,471	84,471	84,471
Maine	0	0	0	0	Texas	190,800	190,800	190,800	190,800
Maryland	0	0	0	0	Vermont	0	0	0	0
Massachusetts	45,872	45,872	45,872	45,872	Virgina	0	0	0	0
Michigan	277,854	277,854	277,854	277,854	West Virginia	0	0	0	0
Minnesota	0	0	0	0	Wisconsin	65,512	65,512	65,512	65,512
Mississippi	0	0	0	0	Western States	256,618	319,993	319,993	319,993
Missouri	252,857	252,857	252,857	252,857					

• Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Expected Maximum Commercial Subtitle C Management Capacity for Hazardous Wastewaters and Sludges Treatment (tons)

State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013
Alabama	5,000	5,000	5,000	5,000
Arkansas	0	0	0	0
Connecticut	181,579	180,366	180,336	180,336
Delaware	0	0	0	0
District of Columbia	0	0	0	0
Florida	19,930	0	0	0
Georgia	32,500	32,500	224,684	224,684
Illinois	456,873	444,583	444,583	444,583
Indiana	336,540	336,540	336,540	336,540
Iowa	121,145	121,145	121,145	121,145
Kentucky	0	0	0	0
Louisiana	53,570	53,570	53,570	53,570
Maine	11,796	11,796	11,796	11,796
Maryland	20,886	20,886	20,886	20,886
Massachusetts	0	0	0	0
Michigan	1,899,170	1,898,513	2,073,513	2,073,513
Minnesota	33,728	33,728	33,728	33,728
Mississippi	0	0	0	0
Missouri	67,041	58,324	58,324	58,324

State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013
New Hampshire	0	0	0	0
New Jersey	27,651,302	27,651,302	27,651,302	27,651,302
New Mexico	0	0	0	0
New York	762,260	762,260	762,260	762,260
North Carolina	32,005	32,005	32,005	32,005
Ohio	1,027,904	1,163,369	1,179,153	1,179,153
Oklahoma	53,979	53,979	53,979	53,979
Pennsylvania	748,799	748,799	748,799	748,799
Puerto Rico	0	0	0	0
Rhode Island	49,997	49,997	49,997	49,997
South Carolina	99,392	99,392	99,392	99,392
Tennessee	649,898	649,898	649,898	649,898
Texas	90,500	98,800	98,800	98,800
Vermont	0	0	0	0
Virgina	33,700	33,700	33,700	33,700
West Virginia	2,304,000	2,304,000	3,456,000	3,456,000
Wisconsin	205,335	205,335	205,335	205,335
Western States	1,511,934	1,204,524	1,274,524	1,274,524

• Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Expected Maximum Commercial Subtitle C Management Capacity for Landfill (tons)

State	Baseline	Commercial Subtitle C Management Capacity			State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	517,189	600,000	600,000	600,000	New Hampshire	0	0	0	0
Arkansas	0	0	0	0	New Jersey	0	0	0	0
Connecticut	0	0	0	0	New Mexico	0	0	0	0
Delaware	0	0	0	0	New York	308,750	1,174,770	2,831,010	2,028,900
District of Columbia	0	0	0	0	North Carolina	0	0	0	0
Florida	0	0	0	0	Ohio	235,000	2,319,000	1,694,394	236,980
Georgia	0	0	0	0	Oklahoma	1,261,260	1,257,812	1,240,574	1,212,993
Illinois	1,476,089	1,347,663	962,387	63,407	Pennsylvania	0	0	0	0
Indiana	4,881,459	4,883,956	4,548,942	3,883,909	Puerto Rico	0	0	0	0
Iowa	0	0	0	0	Rhode Island	0	0	0	0
Kentucky	0	0	0	0	South Carolina	97,906	135,000	0	- 555,268
Louisiana	6,409,891	4,992,557	4,833,947	4,489,781	Tennessee	0	0	0	0
Maine	0	0	0	0	Texas	1,343,000	1,701,000	735,000	-1,519,000
Maryland	0	0	0	0	Vermont	0	0	0	0
Massachusetts	0	0	0	0	Virgina	0	0	0	0
Michigan	1,150,510	850,000	250,000	0	West Virginia	0	0	0	0
Minnesota	0	0	0	0	Wisconsin	0	0	0	0
Mississippi	0	0	0	0	Western States	27,125,854	28,177,306	27,016,049	21,558,462
Missouri	0	0	0	0					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Expected Maximum Commercial Subtitle C Management Capacity for Deepwell - Underground Injection (tons)

State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013
Alabama	0	0	0	0
Arkansas	0	0	0	0
Connecticut	0	0	0	0
Delaware	0	0	0	0
District of Columbia	0	0	0	0
Florida	0	0	0	0
Georgia	0	0	0	0
Illinois	0	0	0	0
Indiana	0	0	0	0
Iowa	0	0	0	0
Kentucky	0	0	0	0
Louisiana	164,381	164,381	164,381	164,381
Maine	0	0	0	0
Maryland	0	0	0	0
Massachusetts	0	0	0	0
Michigan	0	0	0	0
Minnesota	0	0	0	0
Mississippi	0	0	0	0
Missouri	0	0	0	0

State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013
New Hampshire	0	0	0	0
New Jersey	0	0	0	0
New Mexico	0	0	0	0
New York	0	0	0	0
North Carolina	0	0	0	0
Ohio	525,420	525,420	525,420	525,420
Oklahoma	12,495	12,495	12,495	12,495
Pennsylvania	0	0	0	0
Puerto Rico	0	0	0	0
Rhode Island	0	0	0	0
South Carolina	0	0	0	0
Tennessee	0	0	0	0
Texas	2,549,800	2,549,800	2,549,800	2,549,800
Vermont	0	0	0	0
Virgina	0	0	0	0
West Virginia	0	0	0	0
Wisconsin	0	0	0	0
Western States	0	0	0	0

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Appendix C

Adjustments to Commercial Capacity Data

- The Agency adjustments to state-submitted data in the following table apply to each year as presented in the State CAPs: 1991, baseline, 1993, 1999, and 2013, except for adjustment for the National Cement facility, which applies to 1999 and 2013.

Facilities	State CAP Data (tons)	Agency Adjustment (tons)	Agency Adjusted Data (tons)	Reason for Change
Organics Recovery				
Marine Shale, LA	55,000	-55,000	0	Permit was denied
Clean Harbors, MA	11,318,278	-11,301,278	17,000	Error in BRS data
Energy Recovery–Liquids				
National Cement, CA	37,000	-37,000	0	Permit was denied
Marine Shale, LA	31,000	-31,000	0	Permit was denied
Energy Recovery–Sludges/Solids				
Marine Shale, LA	73,000	-73,000	0	Permit was denied
Rhone Poulenc, LA	155,338	-155,338	0	Sludges/solids capacity was reclassified as liquids capacity
Incineration–Liquids and Gases				
Rhone-Poulenc, LA	775,099	-715,099	60,000[a]	Prior estimates did not reflect real operating conditions
Rollins, LA	540,599	-479,599	61,000[b]	Prior estimates did not reflect real operating conditions
Incineration–Sludges/Solids				
Rhone-Poulenc, LA	371,124	-371,124	0	Sludges/solids capacity was reclassified as liquids and gases capacity
Rhone-Poulenc, TX	40,000[c]	-40,000	0	Sludges/solids capacity was reclassified as liquids and gases capacity
Rollins, LA	117,714	-76,714	41,000[b]	Prior estimates did not reflect real operating conditions

[a] *EI Digest*, June 1994. EPA is unable to release to the public its facility-level LDR program capacity information for this or other incinerators because it has been claimed as confidential business information.

[b] Based on *EI Digest*, June 1994, which reported 102,000 tons/year of capacity. EPA Land Disposal Restrictions (LDR) program data indicate that 60 percent of commercial incineration capacity treats liquids and gases and 40 percent treats sludges and solids. Thus, EPA allocated 61,000 (0.6 x 102,000) tons to Incineration–Liquids and Gases and 41,000 (0.4 x 102,000) tons to Incineration–Sludges/Solids.

[c] Texas did not report the capacity of specific facilities in its Phase 1 CAP. EPA assumed this facility's (double counted) capacity is 40,000 tons, based on *EI Digest*, May 1993.

Landfill Adjustments

- EPA also manipulated commercial landfill capacity data for Alabama and South Carolina to make the data employable in the CAP Phase 1 Data System, which EPA used to do the National Assessment calculations.

- These manipulations were consistent with the information provided by the states. They were necessary because the landfills in these states have statutorily-imposed limits on the amount of wastes that can be disposed of per year. The CAP Phase 1 Data System is structured to use data, not on the rate of disposal, but rather on the total stock of landfill capacity that can be utilized over the landfill's life.

- The Alabama and South Carolina landfill capacity data were also manipulated to be consistent with the System's methodology for depleting landfill capacity. This methodology distinguishes between states with and without landfill capacity.

  - States with landfills. For projection year estimates of the maximum available supply of capacity in Table 6 of the state's submissions, the model requires figures representing the amount of capacity available during the projection period (e.g., start of 1994 through start of 1999 for one-time waste generated in the state and both recurrent and one-time wastes from other states). Preparing these estimates requires subtracting the state's recurrent demand for landfill capacity during the projection period from the state's maximum available capacity at the end of the prior period.

  - States without landfills. In contrast, the model shows no available capacity for states without landfill capacity. In the national assessment, these states' demand for capacity is subtracted from the maximum available capacity for states with landfills.

- The landfill adjustments described below did not change the meaning of the data submitted by Alabama and South Carolina, but merely manipulated its form to be useable in the CAP Phase 1 Data System.

Alabama

- **Background**

  - The Chemical Waste Management landfill in Emelle, Alabama can receive no more than 600,000 tons/per year, as specified by State law.

  - The facility's estimated maximum available permitted capacity at the end of 1993 was 20,000,000 tons, which will last until 2027 at the maximum utilization rate.

  - In 1991, the facility disposed of about 520,000 tons of hazardous waste.

  - The State's projected recurrent landfill demand is 16,536 tons in 1993 and 16,361 tons/year from 1994 through 2013 (based on the reported demand for 1999 and 2013).

- **Adjusted Maximum Landfill Capacity in Tons for Use in the State's Table 6**

  - 1999: $4,101,659 = (7 \times 600,000) - (16,536 + (5 \times 16,361))$

  - 2013: $12,272,605 = (21 \times 600,000) - (16,536 + (19 \times 16,361))$

- **What These Figures Mean**

  - The 1999 calculation represents the maximum capacity available between the start of 1993 and the

end of 1999 that has not been used, prior to the start of 1999, by Alabama recurrent waste demand. This maximum amount can be utilized only if the 600,000 limit is reached during each year between 1993 and 1999.

- The calculation for 2013 represents the maximum capacity available between the start of 1993 and the end of 2013 that has not been used, prior to the start of 2013, by Alabama recurrent demand. This maximum amount can be utilized only if the 600,000 limit is reached during each year between 1993 and 2013.

South Carolina

- **Background**
  - The Laidlaw/GSX landfill in Pinewood, South Carolina can receive up to 135,000 tons/per year, as specified by State law.
  - At the end of 1993, the facility's total remaining capacity was 1,800,000 tons, according to *El Guide to Hazardous Waste Landfills in Canada and the United States*, Environmental Information Ltd, 1994.
  - South Carolina state statute requires the landfill to close January 1,2000.
  - In recent years, the facility has disposed of close to 135,000 ton/year.
  - The State's projected recurrent landfill demand is 39,662 tons/year during the projection years.
- **Adjusted Maximum Landfill Capacity in Tons for Use in the State's Table 6**
  - 1999: 707,028 = (7 x 135,000) - (6 x 39,662)
  - 2013: 707,028 = (7 x 135,000) - (6 x 39,662)
- **What These Figures Mean**
  - The 1999 calculation represents the maximum capacity available between the start of 1993 through the end of 1999 that has not been used, prior to the start of 1999, by South Carolina recurrent waste demand. This maximum amount can be utilized over this time period only if the 135,000 limit is reached during each year between 1993 and 1999.
  - The 2013 calculation represents the maximum capacity available between the start of 1993 through the end of 2013 that has not been used, prior to the start of 2013, by South Carolina recurrent waste demand. It is identical to the 1999 value because any additional wastes generated after the landfill closes in 1999 will not go to that landfill; that is, no new landfill capacity is available after 1999, but no new in-state utilization of landfill capacity occurs either. The consolidation equations in the national aggregation database system take care of placing this unmatched demand for landfill capacity (from 2000 and 2013) on the national supply of landfill capacity during that time.

Appendix D

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

This list shows all facilities that managed RCRA hazardous waste commercially in 1994. These facilities comprise the capacity reported in the national assessment. The list includes Subtitle C permitted and interim status facilities and RCRA-exempt facilities. Facilities identified on this list will not necessarily correspond to the facilities identified in State CAPs because States reported information for 1991 and some facilities have opened or closed between 1991 and 1994.

A variety of sources were used to compile this list: the 1991 Biennial Reporting System National Oversight Database, the Resource Conservation and Recovery Information System (RCRIS), "EI Environmental Services Directory 1994", internal Agency information, and state information. The facilities in the list were confirmed with information provided in state CAP submissions and then verified by the states.

The type of management at each facility is identified by CAP management category. Each CAP Management Category is comprised of a number of waste management technologies that are generally interchangeable for managing broad types of wastes (e.g., organics, inorganics including metals, and wastewaters), based on treatment performance. The CAP management categories are comprised of the following system types (as defined in U.S. Environmental Protection Agency, 1991 Hazardous Waste Report Instructions and Forms, EPA Form 8700-13A/B, pp. 90-91.

RECOVERY

Metals Recovery

M011	High temperature metals recovery
M012	Retorting
M013	Secondary smelting
M014	Other metals recovery for reuse: e.g., ion exchange, reverse osmosis, acid leaching
M019	Metals recovery - type unknown

Inorganics Recovery

M031	Acid regeneration
M039	Other recovery - type unknown

Organics Recovery

M021	Fractionation/distillation
M022	Thin film evaporation
M023	Solvent extraction
M024	Other solvent recovery
M029	Solvents recovery - type unknown
M032	Other recovery: e.g., waste oil recovery, nonsolvent organics recovery

COMBUSTION

Pumpable

M051	Energy recovery - liquids
M059	Energy recovery - type unknown
M041	Incineration - liquids
M044	Incineration - gases
M049	Incineration - type unknown

Nonpumpable

M052	Energy recovery - sludges
M053	Energy recovery - solids
M059	Energy recovery - type unknown
M042	Incineration - sludges
M043	Incineration - solids
M049	Incineration - type unknown

TREATMENT

Stabilization/Chemical Fixation

M111	Stabilization/chemical fixation using cementitious and/or pozzolanic materials
M112	Other stabilization
M119	Stabilization - type unknown

Fuel Blending

M061	Fuel blending

Hazardous Wastewaters and Sludges Treatment

M071	Chrome reduction followed by chemical precipitation
M072	Cyanide destruction followed by chemical precipitation
M073	Cyanide destruction only
M074	Chemical oxidation followed by chemical precipitation
M075	Chemical oxidation only
M076	Wet air oxidation
M077	Chemical precipitation
M078	Other aqueous inorganic treatment: e.g., ion exchange, reverse osmosis
M079	Aqueous inorganic treatment - type unknown
M081	Biological treatment
M082	Carbon adsorption
M083	Air/steam stripping
M084	Wet air oxidation
M085	Other aqueous organic treatment
M089	Aqueous organic treatment - type unknown
M091	Chemical precipitation in combination with biological treatment
M092	Chemical precipitation in combination with carbon adsorption
M093	Wet air oxidation
M094	Other organic/inorganic treatment
M099	Aqueous organic and inorganic treatment - type unknown
M101	Sludge dewatering
M102	Addition of excess lime
M103	Absorption/adsorption
M104	Solvent extraction
M109	Sludge treatment - type unknown
M121	Neutralization only
M122	Evaporation only
M123	Settling/clarification only
M124	Phase separation (e.g., emulsion breaking, filtration) only
M125	Other treatment
M129	Other treatment - type unknown

DISPOSAL

Landfill

M132	Landfill
M133	Surface impoundment (to be closed as a landfill)
M137	Other disposal

Deepwell/Underground Injection

M134	Deepwell/underground injection
M137	Other disposal

KEY ABBREVIATIONS AND SYMBOLS

** = capacity restricted to incineration residuals generated on-site.

BIF: Boiler and Industrial Furnace;

Incin: Incinerator

AK: Aggregate Kiln

BLR: Boiler

CK: Cement Kiln

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
REGION I											
CONNECTICUT											
Bridgeport United Recycling (Hitchcock Gas Engine Co.)	CTD002593887						X	X			
Clean Harbors	CTD000604488						X	X			
East Coast Environmental Services Corp.	CTD089631956						X	X	X		
Enthone	CTD001169010							X			
Environmental Waste Resources, Inc. (BLR)	CTD072138969		X				X	X	X		
Macdermid Inc	CTD001164599							X			
POP Industries Inc	CTD097220883	X									
United Oil Recovery, Inc.	CTD021816889						X	X			
MASSACHUSETTS											
Clean Harbors of Natick, Inc.	MAD980523203	X					X				
Clean Harbors Of Braintree, Inc.	MAD053452637		X								
General Chemical Corporation	MAD019371079		X								
Hampden Color & Chemical Co	MAD001114214		X								
Jet-Line Services, Inc.	MAD047075734						X				
Jet-Line Services, Inc.	MAD062179890						X				
Laidlaw Environmental Services (NE), Inc.	MAD000604447		X								
Zecco Inc	MAD052924495										
MAINE											
Jet-line Services, Inc.	MED019051069							X			
NEW HAMPSHIRE											
No Facilities											
RHODE ISLAND											
Chem Pak Corp.	RID008480842		X				X				
Ecoan	RIDVBUU0480	X									

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
Northland Environmental Inc	RID040098352			X				X			
VERMONT											
No Facilities											
REGION II											
NEW JERSEY											
Chemical Waste Management Of NJ	NJD089216790							X			
C P Chemical	NJD002141950							X			
CPS Chemical Co., Inc.	NJD002141190		X								
Degussa Corp, Metz Division (RCRA Exempt)	NJD002195303	X						X			
Dupont E I De Nemours & Co	NJD002385730							X			
Johnson Matthey, Inc.	NJD000692194	X									
Johnson Matthey, Inc. (RCRA Exempt)	NJD980755367	X						X			
Marisol, Inc	NJD002454544						X				
RFE Industries	NJD055090815	X									
Rollins Environmental Services (NJ), Inc.	NJD053288239				Incin	Incin	X				
S & W Waste, Inc	NJD991291105						X	X	X		
Safety-Kleen Corp.	NJD002182897		X				X				
Safety-Kleen Corp.	NJD069039626		X								
Vangard Research (RCRA Exempt)	NJD990753493	X									
NEW YORK											
Ashland Chemical	NYD046877775							X			
AT&T Nassau Metals (RCRA Exempt)	NYD086225596					Incin					
Berkman Bros.	NYD001236017							X			
Cecos International Inc.	NYD080336241							X			
Ceranuseal	NYD002066173		X								
Chemical Management, Inc.	NYD000691949							X	X		

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
CWM Chemical Services	NYD049836679						X	X	X	X	
KBF Pollution (RCRA Exempt)	NYD981182769	X						X			
Laidlaw (BDT)	NYD000632372		X		Incin	Incin		X			
LEA Ronal	NYD001325661	X				Incin					
Mercury Refining Company, Inc.	NYD048148175	X									
Norlite Corporation (ThermalKem)	NYD080469935				BIF						
Northeast Environmental Services Inc.	NYD057770109						X	X			
Photocircuits Corp.	NYD096920483							X			
Pride Solvents And Chemical Co inc.	NYD057722258		X								
SCI Systems, Inc.	NYD982271793		X								
Solvents And Petroleum Service Inc.	NYD013277454		X								
State University of NY	NYD071600100	X									
Weksler Instruments	NYD005920194		X								
PUERTO RICO											
Safety Kleen Environsystems Co.	PRD090399718		X				X				
Safety Kleen Environsystems (Dorado)	PRD981182421						X				
REGION III **DISTRICT OF COLUMBIA**											
No Facilities											
DELAWARE											
No Facilities											
MARYLAND											
Clean Harbors Env. Svcs. Co., Inc	MDD980555189							X			
PENNSYLVANIA											
Bethlehem Apparatus Company, Inc	PAD002390961	X									
Calgon Carbon Corp	PAD000736942		X								

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
Capital Parts Washers, Inc.	PAD987332343		X								
Chemical Waste Mgt. (Delaware Container Co. Inc.)	PAD064375470						X				
East Penn Manufacturing (RCRA Exempt)	PAD002330165	X									
Envirite Corporation	PAD010154045							X	X		
Envirotrol Inc.	PAD980707087		X								
Gemcham, Inc.	PAD009439662						X				
Exide (General Battery Corp.)	PAD990753089	X						X			
Harcros Pigments, Inc.	PAD002391548	X									
Horsehead Resource Dev. Co., Inc.	PAD002395887	X									
Inmetco (RCRA Exempt)	PAD087561015	X									
Kaystone Cement Company (CK)	PAD002389559				BIF						
Medusa Cement Co. (CK)	PAD083965897				BIF						
Mill Service, Inc.	PAD004835146							X			
Molycorp, Inc.	PAD030068282	X									
Republic Environmental Systems, Inc. (Waste Conversion)	PAD085690592							X	X		
WRC Processing	PAD981038227	X									
VIRGINIA											
Belpar Environmental (Chemical Waste Management, Inc.)	VAD988175055		X								
Dynachem, Inc.	VAD105838874		X								
ERC Pre-Treatment Facility	VAD086293719							X			
Prillaman Chemical Corporation	VAD003111416		X								
Solite (AK)	VAD046970521				BIF						
Solite (Old Plant) (AK)	VAD042755082				BIF						
WEST VIRGINIA											
Adsorption Systems, Inc	WVD981107600							X			

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
REGION IV											
ALABAMA											
Allied Chemical Corp (Allied-Signal Tar Prod.)	ALD031499833					Incin		X			
All-Worth Enterprises, Inc.	ALD094476793		X								
Chemical Waste Management, Inc.	ALD000622464						X		X	X	
Fisher Industrial Service, Inc.	ALD981020894						X				
Lafarge (Meduse)	ALD067119966				BIF						
M&M Chemical & Equipment Company, Inc.	ALD070513767		X				X				
Sanders Lead Company	ALD046481032	X									
Systech Environmental Corporation	ALD981019045						X				
FLORIDA											
Ashland Chemical Co	FLD067230771		X				X				
Chemical Pollution Control, Inc	FLD984168112	X									
Environtech S E Inc	FLD101877876		X								
Florida Stabs (AK)	FLD004059085				BIF						
Industrial Water Services, Inc.	FLD981928484		X								
Integrated Resource Recovery Inc	FLD981018273							X			
Laidlaw Environmental Services Of Bartow	FLD980729610		X				X				
Oldover Corporation	FLD000737312						X				
Sparkle Corp	FLD982121592		X								
GEORGIA											
Alternate Energy Resources, Inc	GAD033582461		X				X	X			
Chemical Conservation Of Georgia, Inc.	GAD093380814		X				X				
MCF Systems Atlanta, Inc	GAD981269095		X								
Chemical Waste Mngt (Ohm Resource Recovery Corp.)	GAD096629282						X		X		
Tri-state Steel Drum, Inc.	GAD033842543						X		X		

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
KENTUCKY											
Atochem (M & T Chemical)	KYD006373922				Incin	Incin		X			
Calgon Corp	KYD005009923		X								
Environmental Conservation Systems, Inc. (Oldover)	KYD000770313						X				
Kentucky Solite Corporation (AK)	KYD059568220			X							
Kyana Oil Inc.	KYD000821942						X	X	X		
Louisville Envrionmental Services (B-T Energy)	KYD079661146						X				
L.W.D., Inc.	KYD088438817				Incin	Incin			X		
Safety-Kleen Corp.	KYD053348108		X				X				
MISSISSIPPI											
Enterprise Recovery	MSD000693176		X								
United Cement/Holnam (CK)	MSD077655876				BIF		X				
NORTH CAROLINA											
Carolina Solite (AK)	NCD003152642				BIF						
Ecoflo, Inc.	NCD980842132						X				
Detrex (Gold Shield Solvents Div.)	NCD049773245		X								
Heritage Environmental Services, Inc.	NCD121700777						X	X			
Laidlaw Environmental Services (ta), Inc.	NCD000648451								X		
Oldover Corporation	NCD000773655						X				
SOUTH CAROLINA											
CP Chemicals	SCD070371885	X									
Engelhard Corporation	SCD981866007	X									
Giant Cement Company, Inc (CK)	SCD003351699				BIF	BIF					
OSX Services Of South Carolina Inc	SCD070375985								X	X	
Laidlaw Environmental Services, Inc	SCD981467616				Incin						
Safety Kleen Corp	SCD077993488		X								

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
Safety Kleen/Holman Cement	SCD003368891				BIF		X				
Southeastern Chemical Company - Omni	SCD036275626		X				X	X			
ThermalKEM, Inc	SCD044442333				Incin	Incin					
TENNESSEE											
Allworth (Southdown Environmental Systems, Inc.)	TND981920119						X				
Dixie Cement Company, Inc. (CK)	TND106203375				BIF	BIF					
General Smelting & Refining, Inc.	TND004048690	X									
Horsehead Resource Dev. Co., Inc. (RCRA Exempt)	TND982144099	X									
Laidlaw Environmental Services (ga), Inc.	TND000614321		X				X				
Laidlaw Environmental Services of Nashville (Onco, Inc.)	TND981922826		X					X			
Laidlaw Env. Serv. (WT) Inc. (Tricil Env. Serv.)	TND000772277							X			
Refined Metals	TND067690040	X									
REGION V **ILLINOIS**											
American Chemical & Refining	ILD000675249	X									
American Waste Processing, Ltd.	ILD000716894							X			
Baron Blakeslee	ILD051937068		X								
Beaver Oil Co., Inc.	ILD064418353						X	X			
Behr Precious Metals	ILD006935571	X						X			
Century (Southdown Environmental Systems, Inc.)	ILD099215303		X			BIF					
Chemical Waste Management, Inc. - CID	ILD010284248							X	X	X	
Clayton Chemical Company	ILD066918327		X				X				
Entech (CP Inorganics)	ILD062480850							X			
Envirite Corporation	ILD000666206							X	X		
Heritage Environmental Services, Inc.	ILD085349264						X				
Horsehead Resource Dev. Co., Inc.	ILD040891368	X									

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
Mar-Cor Industries, Inc.	ILD984774695	X									
Peoria Disposal Co. (pdc)	ILD000805812								X	X	
Recontek, Inc.	ILD984766279	X									
Safety-Kleen Corp.	ILD005450697		X								
Safety-Kleen Corp.	ILD000805911		X								
Safety Kleen Corp.	ILD980613913		X				X				
Trade Waste Incineration (Chemical Waste Manag.)	ILD098642424				Incin	Incin					
United Refining & Smelting	ILD005087630	X						X			
INDIANA											
ESSROC (Centech, Lp)	IND005081542				BIF						
Chemical Waste Management Of Indiana Inc.	IND078911146								X	X	
Consolidated Recycling Co., Inc.	IND098958283		X								
Dupont-ecco	IND981783681	X									
General Battery Corp (EXIDE)	IND000717959	X									
Detrex (Gold Shield Solvents Div.)	IND085616837		X								
Heritage Environmental Services, Inc.	IND093219012		X				X	X	X		
Hydrite Chemical Co. (Avaegic Industries)	IND984865541		X								
Indiana Industrial Plating Inc.	IND005261623							X			
Industrial Fuels & Resources, Inc.	IND980590947						X	X			
Lone Star Industries (Systech Env.) [CK] [NOT USED IN CAP]	IND006419212				BIF	BIF					
Mason Metals	IND005460209	X									
Metal Working Lubricants Co.	IND000646950		X								
Pollution Control Of Indiana, Inc.	IND000646943						X				
Quemetco [RCRA Exempt]	IND000199653	X									
Reclaimed Energy	IND000780403		X				X				

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
Refined Metals	IND000718130	X									
Rhone-Poulenc Basic Chemical Co. (SAF)	IND001859032				BIF						
Safety Klean Oil Recovery	IND077042034						X	X			
MICHIGAN											
Ag Hog, Inc.	MID981094618	X									
Chem-met Services, Inc.	MID096963194								X		
City Environmental, Inc.	MID054683479								X		
City Environmental, Inc.	MID980991566							X	X		
City Environmental Inc. - Calahan	MID006523385		X								
Cyanotem	MID098011992							X			
Drug & Laboratory Disposal, Inc.	MID092947928							X	X		
Dynecol, Inc.	MID074259565			X				X			
Edwards Oil Service, Inc.	MID088754688			X				X			
Environmental Waste Control Inc.	MID057002602		X					X			
Gage Products (BLR)	MID005338801		X								
Detrex - Gold Shield Solvents Div.	MID091605972		X								
Laferge (CK)	MID005379607				BIF						
Meridan Environmental Services, Inc.	MID981192081			X							
Michigan Disposal, Inc.	MID000724831								X		
Michigan Recovery Systems, Inc.	MID060975844		X				X				
Petro-Chem Complex	MID980615298						X				
Petro-Chem Complex Solvent Distillers	MID980684088		X								
PVS Chemicals Inc Michigan	MID981195936			X							
RTR Inc	MID985566629		X								
Verbrugge Oil Inc	MID006410377		X								
Wayne Disposal, Inc	MID048090633									X	

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
MINNESOTA											
Enviruchem Inc.	MND980996805	X						X			
Gopher Smelting And Refining Co (RCRA Exempt)	MND006148092	X									
Pennzoil	MND006224612		X								
U.S. Filter Recovery Services, Inc.	MND981098478	X						X			
OHIO											
Chemical Solvents	OHD980897656		X								
Chemical Waste Management, Inc.	OHD020273819							X			X
Chemtrus Corp	OHD066060609		X				X	X			
Clark Processing, Inc	OHD004274031		X				X	X			
Clean Harbors Env Svcs. Co., Inc.	OHD000724153							X			
CWM Resource Recovery, Inc	OHD093945293		X								
Englehard Inc	OHD000724088			X				X			
Envirite (Republic Env Systems)	OHD980700942						X	X	X		
Envirite Corporation	OHD980568992							X	X		
Environmental Enterprises, Inc.	OHD083377010						X	X	X		
Environmental Purification Industries (BLR)	OHD986983237				BIF	BIF		X			
Envirosafe Services Of Ohio, Inc.	OHD045243706								X	X	
Evergreen Environmental Group, Inc.	OHD055522429		X				X	X	X		
Hukill Chemical Corporation	OHD001926740		X				X	X			
Klor Kleen Inc.	OHD980821862		X				X	X			
Lafarge (CK)	OHD005048947				BIF	BIF	X				
Liberty Solvents & Chemicals Co., Inc.	OHD052324548		X								
Master Metals	OHD097613871	X									
North East Chemical Corporation	OHD980681571		X				X	X			
Research Oil Company	OHD004178612		X					X			

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
Rose Incineration Services, Inc.	OHD048415665				Incin	Incin	X				
Safety-Kleen Corp.	OHD980587364		X				X				
Spring Grove Resource Recovery (Southdown Env. Sys)	OHD000816629							X			
Systech	OHD005048947						X				
Tricil Environmental Services Inc.	OHD081290611							X	X		
Waste Technologies Industries (WTI)	OHD980613541				Incin	Incin					
WCI Steel Inc.	OHD060409521			X							
WISCONSIN											
Ashland Chemical	WID053689196										
Chemical Waste Management, Inc.	WID003967148								X		
EQ0 Environmental Incorporated	WID988580056						X	X	X		
Hydrite Chemical Co.	WID000808824		X								
Milwaukee Solvents And Chemicals Corp.	WID023350192		X				X				
Mineral Springs Corporation	WID988566543						X	X			
Safety-Kleen Corp.	WID980896633										
Safety-Kleen Corp.	WID981097769										
Waste Research & Reclamation Co., Inc.	WID990829475		X		Incin		X	X			
Wis Fineblanking	WID102220704							X			
REGION VI											
ARKANSAS											
Ash Grove Cement Co (CK)	ARD981512270				BIF	BIF					
Ensco, Inc	ARD069748192				Incin	Incin					
Rineco Chemical Industries	ARD981057870		X				X				
LOUISIANA											
Allied's Processor Sales Services (RCRA Exempt)	LAD087029872	X									
AMAX Metal Recovery Inc	LAD058472721	X									

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
Catalyst Recovery	LAD980622161					X					
Chemical Waste Management, Inc.	LAD000777201						X	X	X	X	
Evangeline Medical & X-ray Distributors (RCRA Exempt)	LAD981589542	X									
Laidlaw Environmental Services, Inc.	LAD079464095						X				
Laidlaw Environ Services (R&D Fabricating & Mfg)	LAD981055791					X					
Louisiana X-Ray Accessories, Inc (RCRA Exempt)	LAD985191447	X									
New Orleans Silversmiths (RCRA Exempt)	LAD981152903	X									
Pure Solve, Inc. (RCRA Exempt)	LAD981512627		X								
Rhone-Poulenc Basic Chemicals Co.	LAD008161234				Incin		X	X			
Rollins Environmental Services Of La, Inc.	LAD000778514										X
Rollins Environmental Services (la), Inc.	LAD010395127				Incin	Incin			**	**	
Schuylkill Metals (MRE)	LAD008184137	X									
UOP Shreveport Plant (RCRA Exempt)	LAD057109449	X									
X-ray Unlimited, Inc. (RCRA Exempt)	LAD981513021	X									
X-ray Unlimited Inc (RCRA Exempt)	LAD985170299	X									
NEW MEXICO											
Chino Mines Company (RCRA Exempt)	NMD007396930	X									
Southwest Radiographics	NMD097138382	X									
OKLAHOMA											
Chief Supply Corporation	OKD089761290		X			BIF	X				
Hydrocarbon Recyclers (USPCI-HRI)	OKD000632737		X				X	X	X		
Residual Technologies Inc.	OKD000402396		X					X	X		X
USPCI-Lone Mountain	OKD065438376						X	X	X	X	
TEXAS											
Allwaste Recovery	TXD102599339							X			
Alpha Omega Recycling Inc	TXD981514383	X									

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
Chemical Reclaimation Serv. (Southdown Env. Sys.)	TXD046844700		X								
Chemical Waste Management, Inc.	TXD000761254										X
Chemical Waste Management, Inc.	TXD000838896				Incin	Incin				X	X
Detrex (Gold Shield Solvents Div.)	TXD980626154		X								
Disposals Systems, Inc. (GNI Group, Inc.)	TXD000719518		X						X		X
Empak	TXD097673149						X				X
Encycle/Texas, Inc.	TXD008117186	X						X			
Eurecat U.s. Incorporated	TXD106829963	X									
GNB Batteries Inc (RCRA Exempt)	TXD006451090	X									
Gibraltar Chemical Resources, Inc.	TXD000742304		X				X				X
Gulf Chemical & Metallurgical Corporation (RCRA Exempt)	TXD074195678	X									
Gulf Coast Waste Disposal Authority	TXD000895249									••	
Heat Energy Advanced Technology, Inc. (HEAT)	TXD980624035		X				X				
Hornshead Recovery	TXD988087052	X									
Malone Service Co.	TXD005948740										X
NSSI/Recovery Services, Inc.	TXD982560294		X				X	X			
Olin (IF)	TXD008097487				BIF						
Parkans	TXD008105959	X									
Recovery and Reclamation	TXD981514268							X			
Rhone-Poulenc Basic Chemicals Co.	TXD008099079				Incin						
Rollins Environmental Services (la), Inc.	TXD055141378				Incin	Incin			••	••	
Safety-Kleen Corp. Denton Recycle Center	TXD077603371		X				X				
Southern California Chemicals	TXD047823265	X									
SDC (Southwest Env. Services, Inc.)	TXD030923361										
Texas Ecologist, Inc.	TXD069452340								X	X	

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
TXI, Inc (Texas Industries) [CK]	TXD007349327				BIF	BIF					
Treatment One	TXD055135388						X	X			
USPCI	TXD052649027		X				X				
REGION VII											
IOWA											
Northland Products	IAD022365480		X								
John Deere Waterloo Works	IAD005289806							X			
KANSAS											
Aptus, Inc.	KSD981506025				Incin	Incin	X				
Ash Grove Cement Plant [CK]	KSD031203318				BIF	BIF					
Heartland/Summit Env. Corp. [CK]	KSD980739999				BIF	BIF	X				
Lafarge Corp. [CK]	KSD007148034				BIF	BIF					
Systech Environmental Corporation	KSD980633259						X				
USPCI	KSD007246846		X				X				
MISSOURI											
Burlington Environmental	MOD000610766		X			BIF	X				
Continental Cement (MFR, Inc.) [CK]	MOD054018288		X		BIF	BIF	X				
Doe Run Co. [RCRA Exempt]	MOD059200089	X	X								
Essex Waste Mgmnt. Services, Inc.	MOD980962849						X	X			
Hazardous Waste Recovery, Inc.	MOD981123391				BIF	BIF	X	X			
Heritage Environmental Services, Inc.	MOD981505555						X				
ICI Explosives	MOD077887909			X							
Industrial Fuels And Resources, Inc.	MOD980632954						X				
Lone Star Industries [CK]	MOD981127319				BIF	BIF	X				
River Cement Co., Selma Park (Chemtech, LP) [CK]	MOD050232560				BIF	BIF	X				
Safety-Kleen/Hadman Cement	MOD029729688				BIF	BIF	X				

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
NEBRASKA											
Ash Grove Cement Plant	NED007260672				BIF	BIF					
Ecove (Waste Tech Services)	NED981723513				Incin	Incin					
REGION VIII											
COLORADO											
Enviroserve, Inc.	COD983788688	X					X	X			
Hwy. 36 Land Development Co.	COD991300484							X	X	X	
Chemical Waste Management (Oil & Solvent Process Co.)	COD980591184		X				X	X	X		
MONTANA											
Anaconda	MTD006230346	X									
NORTH DAKOTA											
No Facilities											
SOUTH DAKOTA											
No Facilities											
UTAH											
Aptus, Inc	UTD981552177				Incin	Incin					
Engelhard Corporation (catalyst recovery)	UTD009073800	X									
USPCI	UTD991301748							X	X	X	
USPCI Clive	UTD982595795				Incin	Incin					
WYOMING											
No Facilities											
REGION IX											
ARIZONA											
Allied Precious Metals Recyc, Inc.	AZT050010685	X						X			
Cyprus Miami Mining Corporation	AZD060624251	X									
Recycling Resources, Inc.	AZD049318009		X				X				

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
Rinchem Co	AZD980892731		X				X	X			
Romic Chemical Corp.	AZD009015389		X								
Wastates Carbon-arizona	AZD902441263							X			
World Resources Co. (WRC)	AZD980735500							X			
CALIFORNIA											
AAA Distribution/Dry Clean Serv.	CAD981397417		X								
American Diversified Silver, Inc.	CAD982524613	X									
Appropriate Technologies (APTEC)	CAT080010101							X			
Bayday Chemical	CAT080012263		X								
Boliden Metech, Inc. Western D [RCRA Exempt]	CAD077182239	X									
Broco, Incorporated	CAT080022148							X			
Chem-tech Systems, Inc.	CAT080033681							X			
Commodity Refining Exchange, Inc	CAD981402522	X									
Crosby & Overton, Inc.	CAD028409019							X			
Detrex/Gold Shield Solvents	CAD020161642		X								
Drew Resource Corp	CAD070148432	X									
ECS Refining	CAD003963592	X									
Engelhard West, Inc.	CAT000612150	X									
Entech Recovery, Inc (CP Organics)	CAD981160948	X									
GNB Incorporated	CAD097854541			X							
Holchem Inc (DBA Services Chemical)	CAT000612333		X								
J & B Enterprises	CAD069138899	X									
Kettleman Hills Treatment Facility - CWM	CAT000646117							X	X	X	
Kinsbursky Bros Supply Inc	CAD088504881			X							
Laidlaw Environmental Services, Inc	CAD000633164									X	
Laidlaw Environmental Services, Inc	CAD980675276									X	

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
Micro Metallics Corporation	CAD069124717	X									
Norris Environmental Services	CAD097030993							X			
Oil & Solvent Process Co. (OSCO)	CAD008302903		X					X			
Omega Recovery Services Corporation	CAD042245001		X					X			
Pepper Oil Co	CAL000041748							X			
Peto's Metal Reclamation	CAD981685472	X									
P O P Industries Inc	CAD060398229	X									
Photo Waste Recycling Co., Inc.	CAD981161367	X									
Quametco	CAD066233966			X							
Quick Silver Products	CAD981424732	X									
Oil Process Co. (Rollins OPC) Inc.	CAD050806850							X			
RhoChem	CAD008364432		X								
Ronnic Chemical Corp	CAD009452657		X								
Safety-Kleen Corp	CAD093459485		X								
Southern California Chemicals	CAD008488025	X									
Summit Environmental Corporation	CAD089446710		X								
Superior Industries Internatio	CAD050809177										
Systech Environmental Corp./National Cement	CAT080031628				BIF						
Technichem, Inc.	CAD981375983		X								
TSM Recovery and Recycling Co.	CAD108040858	X									
USPCI Solvent Service Co., Inc.	CAD059494310		X					X	X		
HAWAII											
Unitek Environmental Service, Inc.	HIT000603514		X			BIF	X				
NEVADA											
Envicam (MR NOT USED IN CAP)	NVD980895338	X						X			
US Ecology, Inc.	NVT330010000								X	X	

1994 COMMERCIAL TREATMENT AND DISPOSAL FACILITIES OF RCRA HAZARDOUS WASTE

NAME	EPA ID	CAP MANAGEMENT CATEGORIES									
		RECOVERY			COMBUSTION		TREATMENT			DISPOSAL	
		Metal	Organic	Inorganic	Pumpable	Nonpumpable	Fuel Blend.	Waste Water	Stabilization	Landfill	Deepwell
REGION X											
ALASKA											
Alaska Pollution Control	AKD983068685							X			
IDAHO											
Envirosafe Services Of Idaho, Inc.	IDD073114654							X	X	X	
OREGON											
Chemical Waste Mgmt. of the Northwest	ORD089452353								X	X	
Larry Freepons Inc. (RCRA Exempt)	ORD980979546		X								
Tektronix, Inc.	ORD009020231							X			
WASHINGTON											
Bay Zinc	WAD027530526	X									
Burlington Environmental	WAD000812917							X	X		
Burlington Environmental	WAD991281767						X	X	X		
Burlington Environmental	WAD020257945							X			
Burlington Environmental	WAD092300250		X					X			
Burlington Environmental - Georgetown Facil.	WAD000812909		X				X	X			
Cameron-Yakima Inc	WAD009477175			X							
Northwest Enviro Service, Inc.	WAD058367152		X								
CleanCare (Northwest Processing)	WAD980738512		X								
Petroleum Reclaiming Services, Inc.	WAD980511729		X								
SOL-PRO, Inc.	WAD981769110		X				X				

Appendix E

CAP Management Categories

Discussion of Technologies

For each of the 12 CAP Management Categories, the main technologies used for each category are described, including the types of waste recovered, treated or disposed. Each CAP Management Category is comprised of a number of waste management technologies that are generally interchangable for managing broad types of wastes based on treatment performance.

Metals Recovery

Metals Recovery Technologies

Metals recovery technologies are designed to separate desired metals from other constituents of hazardous wastes. The most common technologies, which are described below, are high temperature metals recovery, retorting, secondary smelting, ion exchange, and acid leaching.

High temperature metals recovery is used to treat hazardous wastes that contain metals such as cadmium, chromium, lead, nickel, and zinc compounds. Metals are separated from the waste at high temperatures through a thermochemical process using carbon, limestone, and silica as the chemical agents. The constituents being recovered from the waste are heated so that they melt and/or volatilize and can be recovered in metallic or oxide form from process vapors or from a molten bath. The high temperature metals recovery process typically consists of a mixing unit, a high temperature processing unit, a product collection system, and a residual treatment system. Other volatile metals, such as arsenic or antimony, may be difficult to separate from the desired metal products and may adversely affect the ability to reuse the recovered materials. Slag, the primary residual from the process, is sometimes cooled in a quench tank and reused either directly or after further processing, or, if the material has no recoverable value, it is land disposed after necessary treatment.

Retorting is similar to high temperature metals recovery in that it provides for recovery of metals from wastes primarily by volatilization and subsequent collection an condensation of the volatilized components. It is used primarily to remove elemental mercury, as well as mercury present in the oxide, hydroxide, and sulfide forms from hazardous wastes.

Secondary smelting is also very similar to high temperature metals recovery, but is generally used for processes that recover lead from hazardous wastes. In this process, waste passes through a smelting furnace where the lead is concentrated into a bullion and separated from slag in molten form.

Ion exchange is primarily used to treat aqueous hazardous wastes with dissolved metals. These wastes might also contain nonmetallic anions such as halides, sulfates, nitrates, and cyanides, and water soluble ionic organic compounds. In ion exchange metals recovery, hazardous metal ions are removed and replaced by nonhazardous ions.

Acid leaching is used to treat hazardous wastes in solid or slurry form that either contain metal constituents that are soluble in a strong acid solution or can be converted by reaction with a strong acid to a soluble form. The acid leaching process is most effective with wastes that have high levels (over 1,000 parts per million) of metal constituents[3]. Leachate from acid leaching generally requires further processing (e.g., ion exchange) to recover metals from the solution.

---

[3] *Treatment Technology Background Document*, January 1991, U.S. EPA, Office of Solid Waste, page 184

Inorganics Recovery

Inorganics Recovery Technologies

Acid regeneration is the primary technology for inorganics recovery and is used to recover mainly halogen and sulfuric acids. These acids are recovered by halogen acid furnaces and sulfur recovery furnaces, respectively, which are regulated under the Boilers and Industrial Furnaces (BIF) Rule. Halogen acid furnaces typically process chlorinated and brominated secondary waste streams, with 20 to 70 percent halogen content by weight, to produce either hydrogen chlorine or hydrogen bromine[4]. Sulfur recovery furnaces are used by sulfuric acid plants to process used sulfuric acid and other sulfur-containing wastes. Typical acid contaminants include organics, inorganics, and water. The contaminated acids and other halogen- or sulfur-containing compounds are thermally decomposed at elevated temperatures and the desired halogen or sulfur compounds captured from the exhaust gases, such as by passing the gases through converted catalyst beds.

Organics Recovery

Organics Recovery Technologies

Organics recovery technologies are used to separate liquid organic wastes, primarily spent solvents (both halogenated and nonhalogenated), for full or partial recovery. The most common technologies, described below, are distillation and solvent extraction. Other technologies include waste oil recovery and non-solvents organic recovery.

Distillation is a thermal treatment technology applicable to the treatment of wastes containing organics that are volatile enough to be removed by the application of heat. Constituents that are not volatilized may be reused or incinerated, as appropriate. Distillation is the process of separating volatile materials using evaporation followed by condensation. The liquids to be separated must have different volatilities and the degree of separation of these liquids is limited by the difference in their volatilities. Distillation for recovery can be limited by the presence of either volatile or thermally reactive suspended solids.

Important distillation technologies are:

•Fractionation. This technology uses tray columns or packed towers equipped with a reboiler, condenser, and an accumulator. The process is not applicable for liquids with high viscosity at high temperature, liquids with a high concentration of solids, polyurethanes, and inorganics. In general, the process is used where recovery of multiple constituents is desired and the waste contains minimal amounts of suspended solids. This process achieves a high product purity.

•Steam Stripping. This process is essentially fractionation with steam as heat source. It is typically applied to wastes with less than 1 percent volatile organics[5].

•Batch Distillation. This technology uses a steam-jacketed vessel, a condenser, and a product receiver. Pressurized steam is usually the source of heat.

•Thin Film Evaporation. This technology uses a steam-jacketed cylindrical vessel and condenser, where the material trickles down the inside cylinder walls in thin streams, and a distribution device that spreads the film over the heated surface. It can be used to treat highly concentrated organic wastes that contain low concentrations of suspended solids.

Solvent extraction is used to treat wastes with a broad range of total organic content, such as certain oil refinery wastes.

---

[4] 56 FR 7140

[5] *Treatment Technologies Background Document*, page 135

Constituents are removed from the waste by mixing it with a solvent that will preferentially dissolve the constituents of concern. The selection of a solvent depends on its solubility with the organic compounds to be removed and the other constituents in the waste. The waste and solvent must be physically immiscible so that after mixing the two immiscible phases can be physically separated by gravity. The process can be either batch or continuous. The simplest, least effective solvent extraction unit is a single-stage system (mixer-setter system). Other types of solvent extraction systems include multi-stage contact extraction (basically a series of single-stage units), countercurrent multi-stage extraction columns, and centrifugal contactors.

Stabilization/Chemical Fixation

Stabilization and chemical fixation refer to treatment processes that chemically or physically immobilize the hazardous constituents in a waste by binding the hazardous constituents into a solid mass. The resulting product has a low permeability that resists leaching.

Stabilization is used to treat wastes containing leachable metals and having a high filterable solids content, low organic carbon content, and low oil and grease content. The leachable metals in a waste are immobilized following the addition of stabilizing agents and other chemicals, and the resulting lattice structure and/or chemical bonds bind the metals to the solid matrix and thereby limit the amount of metal constituents that can be leached. The process normally requires a weighing device, a mixing unit (typically commercial concrete mixers), and a curing vessel or pad. Advantages of stabilization include inexpensive and plentiful raw materials and minimal pretreatment requirements. The main disadvantage is that the large volumes of additives required greatly increase the waste volume to be disposed. The main stabilization technologies are:

•Lime-Based Pozzolan Process. This technology treats sludges and contaminated soils by adding large amounts of siliceous (silica) materials combined with a setting agent such as lime, forming a dewatered stabilized solidified product. Contaminants can include metals, waste oils, and solvents. Materials such as borates, sulfates, and carbohydrates interfere with the process.

•Portland Cement Pozzolan Process. This technology is similar to the lime-based pozzolan process except that the waste is mixed with portland cement. The process is effective for metal cations, latex and solid plastic wastes. Large amounts of dissolved sulfate salts or metallic anions (such as arsenate and borates) can interfere with solidification. Organic material, lignite, silt, or clay in the wastes will increase setting time.

•Sorption. This technology, suitable for organics and inorganics, is commonly used to treat metal sludges removed from aqueous waste streams. Contaminants are bound up in pozzolan-type matrices by physical or chemical sorption, yielding a stabilized, easier to handle material. After treatment, the material is permeable and contains a high concentration of contaminants at its surface; consequently, contaminants may leach.

Two types of ***high temperature stabilization*** include vitrification and high temperature calcination. The vitrification process involves dissolving the waste at high temperatures into glass or glasslike matrix. It is applicable to nonwastewaters containing arsenic (usually in form of arsenate salts), other characteristic toxic metal constituents that are relatively nonvolatile at operating temperature of the process, and certain wastes containing organometallic compounds. The process is not applicable to volatile metallic compounds or wastes containing high levels of constituents that will interfere with the vitrification process, such as chlorides and halogen salts. High temperature calcination, applicable to inorganic wastes that do not contain volatile constituents, involves merely heating the material at high temperatures. The waste is sometimes blended with lime before heating. The process removes water from the waste, converts hydroxides to oxides, and converts the waste into a coherent mass, reducing surface area to minimum.

Fixation processes are applicable to liquid, semi-liquid, or solid wastes that may leach hazardous constituents. The processes can effectively treat a variety of hazardous wastes containing heavy metals, such as sludges from electroplating operations, ion-exchange resins from water demineralization, spent activated carbon, pesticides, nickel-cadmium battery sludge, and

pigment production sludge. The process involves grinding a dewatered waste, mixing the resulting particles with a hardening resin, placing the mixture in a mold, and heating the material until it fuses. The product is hard, solid block with reduced leachability potential, improved handling, and minimal volume increase (unlike conventional stabilization techniques). The most serious drawback is uncertainty about long-term effectiveness.

In the main fixation technologies, asphalt-based and thermoplastic encapsulation, the dewatered waste is mixed within either an asphalt bitumen, paraffin, or polyethylene matrix. These technologies are applicable to hazardous wastes that are complex and difficult to treat, but should not be used for waste with high-water content, strongly oxidizing contaminants, anhydrous inorganic salts, tetraborates, iron and aluminum salts, or volatile organics.

Another stabilization/fixation technology is ***polymerization***. This technology has been applied to spills and used catalysts to convert a monomer or a low-order polymer of a particular compound to a larger polymer. Larger polymers generally have greater chemical, physical, and biological stability. The process is used to treat organics, including aromatics, aliphatics, and oxygenated monomers such as styrene, vinyl chloride, isoprene, and acrylonitrile.

These technologies expand the volume of hazardous wastes to be disposed. The stabilization/fixation of characteristic hazardous waste often generates residuals that are not characteristically hazardous and therefore can be disposed of in Subtitle D landfills.

Combustion-Pumpable and Combustion-Nonpumpable

As explained in the text of the Report, EPA has reorganized the four incineration and energy recovery CAP Management Categories into two categories: Combustion-pumpable and Combustion-Nonpumpable combustion. Combustion-Pumpable includes energy recovery for liquids and incineration of liquids and gases. Combustion-Nonpumpable includes energy recovery and incineration for solids and sludges.

Combustion Technologies

Energy recovery systems burn hazardous waste for its fuel value. The capacity to burn liquids as fuel dominates at a national level, as sludges and solids are not often burned for recovery. Types of energy recovery systems are discussed below. See the discussion of inorganics recovery and of fuel blending for related topics.

•Industrial Kilns. Cement and lightweight aggregate kilns can burn liquid hazardous wastes for their heat value. (A few cement kilns also burn small containers of viscous or solid hazardous waste fuels.) Typically, cement kilns blend the wastes with fossil fuels while aggregate kilns burn 100 percent liquid hazardous waste.

•Industrial Boilers. Some industrial boilers can use limited amounts and types of hazardous wastes as supplements to fossil fuels. The wastes are commonly blended before using as fuel.

All of these units which are currently burning hazardous waste are operating under interim status and have applied for RCRA Part B permits.

Incineration uses controlled, high-temperature combustion processes to break down the organic compounds in a hazardous waste. The incineration of hazardous waste must be performed in accordance with the incinerator design and emmissions regulations in 40 CFR, Subpart O. Incinerators can burn pumpable waste (liquids and gases), nonpumpable waste (solids and sludges), or both. Several types of incinerators are discussed below.

•Liquid Injection Incinerators. These incinerators are used widely for destruction of liquid organic wastes. They operate by spraying the waste mixed with air into a chamber where flame oxidation occurs.

•Rotary Kilns. Rotary kilns can treat most types of solids, liquids, and gases. They consist of a long inclined tube where the waste is placed and rotated slowly as heat is applied. The process is intended for solids, but liquids and gases can be mixed with the solids.

•Fluidized-bed Incinerators. Air is blown through a granular bed (usually sand) until the particles are suspended and move and mix like a fluid. The heated particles come in contact with the wastes to be incinerated and improve the heat transfer. This type of incineration is ideal for sludge and slurries.

Other types of incinerators include two-stage and fixed hearth.

The ash produced from the combustion of hazardous waste also may be hazardous, and therefore must be further treated by stabilization before disposed in a landfill.

Fuel Blending

Fuel blending is the process of blending hazardous waste streams together, generally in tanks, to obtain a fuel that meets the specifications of fuel burners (e.g., energy recovery systems). Fuel blending is not a stand-alone treatment technology; the resulting fuels are subsequently burned, either on or off site, by the systems described under the Combustion-Pumpable and Combustion-Nonpumpable CAP Management Categories.

Hazardous Wastewaters and Sludges Treatment

This CAP Management Category covers a broad range of treatment technologies and treats the largest volume of hazardous waste of any CAP Management Category. Wastes that are treated in this category either undergo further treatment (under this or other CAP Management Categories) or are sent for disposal. Many of these technologies are used together in one treatment system (e.g., chrome reduction followed by chemical precipitation). The discussion of these technologies is organized by the principal type of waste treated: aqueous inorganic, aqueous organic, aqueous inorganic and organic, sludge, and other.

Aqueous Inorganic Treatment

Chrome reduction (hexavalent) is applicable to wastes containing hexavalent chromium wastes, including plating solutions. The process uses a chemical reaction with a reducing agent, such as sulfur dioxide or sodium bisulfite, to reduce chromium from a hexavalent to a trivalent state, so that the chromium can be more easily precipitated. The reduced chromium compounds are precipitated from the solution by raising the pH and the resulting insoluble form of chromium is allowed to settle from the solution.

Cyanide destruction is applicable to wastes containing high concentrations of cyanide, such as concentrated spent plating solutions. This technology is often applied as pretreatment prior to chemical oxidation. The waste is subject to electrolytic reaction with dissolved oxygen in an aqueous solution and broken down into carbon dioxide, nitrogen, and ammonia. The procedure is conducted at elevated temperature, depends on the conductivity of waste, and occurs in a closed cell.

Chemical oxidation changes the chemical form of hazardous material through a chemical reaction with an oxidizing agent that produces carbon dioxide, water, salts, and simple organic acids. Principal chemical oxidants include hypochlorite, chlorine gas, chlorine dioxide, hydrogen peroxide, ozone, and potassium permanganate. This technology is used to treat wastes containing organics, sulfide wastes, and certain cyanide and metal wastes.

Chemical precipitation is used to treat wastewaters containing metals and other inorganic substances such as fluoride. The process removes these metals and inorganics from solution in the form of insoluble solid precipitate by adding a precipitating

agent (e.g., lime, caustic (NaOH), sodium sulfide). The solids that form are then separated from the wastewater by settling, clarification, and/or polishing filtration. Pretreatment may be required for some wastewaters, such as those that contain chromium or cyanide.

Ion exchange is used to treat hazardous wastewaters with metals that are present as soluble ionic species, nonmetallic anions such as halides, sulfates, nitrates, and cyanides, and water soluble ionic organic compounds. Typically, the waste constituents are removed when a waste solution is percolated through a granular bed of the ion exchanger, in which ions from the waste are exchanged with those in the ion exchanger.

Reverse osmosis involves a dilute solution and concentrated solution separated by a semi-permeable membrane. When high pressure is added to the concentrated side, the solution flows through the membrane to the more dilute side, collecting waste constituents that are unable to pass through the membrane.

Aqueous Organic Treatment

Biological treatment processes are used to decompose hazardous organic substances with microorganisms. These processes require stable operating conditions and usually take place in tanks or lagoons. The most common type is aerobic biological treatment, including activated sludge treatment. This method treats wastewaters with low levels of nonhalogenated organics and certain halogenated organics.

Carbon adsorption is used to treat aqueous organic wastewaters with high molecular weights and boiling points and low solubility and polarity, chlorinated hydrocarbons, and aromatics (e.g., phenol). The wastewater is passed through activated carbon beds which attract and hold (adsorb) the organic waste constituents (and possibly inorganics and metals), removing them from the water.

Air stripping is a process used to treat aqueous organic waste with relatively high volatility and low water solubility. The volatile contaminants are evaporated into the air and captured for subsequent treatment. *Steam stripping* is used to treat aqueous organic wastes contaminated with chlorinated hydrocarbons, aromatics, ketones, alcohols. This technology can treat less volatile and more soluble wastes than air stripping and can handle a wide concentration range. First, steam is used to evaporate volatile organics. The evaporated organics are then captured, condensed, and reused or further treated.

Aqueous Inorganic/Organic Treatment

Wet air oxidation is used to treat aqueous waste streams with less than five percent organics, pesticides wastes, and wastewaters containing sulfur, cyanide, or phenolic compounds. It is not recommended for treating aromatic halogenated organics, inorganics, or large volumes of waste. The aqueous solution is heated in the presence of compressed air and dissolved or finely divided organics are oxidized. These oxidized products usually remain in the liquids phase. These liquids can then further treated or sent for disposal. An important advantage of wet air oxidation is that it accepts waste with organic concentrations ranging between those considered ideal for biological treatment or for incineration.

Sludge Treatment

Sludge dewatering (sludge filtration) is used for wastes with high concentrations of suspended solids (generally higher than 1 percent). Sludges can be dewatered to 20 to 50 percent solids. The solid particles are separated from the waste through a filter that permits fluid flow but retains the particles. For this technology, waste can be pumped through a porous filter, drawn by vacuum through a cloth filter, or gravity-drained and mechanically pressured through two continuous fabric belts.

Solvent extraction is used to treat wastes with a broad range of total organic content, such as certain oil refinery wastes. Constituents are removed from the waste by mixing it with a solvent that will preferentially dissolve the constituents of

concern. The waste and solvent must be physically immiscible so that after mixing the two immiscible phases can be physically separated by gravity.

Other sludge treatment methods include addition of excess lime or caustic to increase the alkalinity of the waste and absorption/adsorption processed to remove liquid from the sludge.

Other Wastewaters Treatment

Neutralization is used to treat waste acids and alkalies (bases) in order to eliminate or reduce their reactivity and corrosiveness. In this process, an excess of acidic ions (H^+) is balanced with an excess of base ions (OH^-) to form a neutral solution.

Evaporation is physical separation of a liquid from a dissolved or suspended solid by adding energy to volatilize the liquid. It can be applied to any mixture of liquids and nonvolatile solids. The liquid should volatilize at reasonable temperature.

There are many types of *settling/clarification* processes. One type is sedimentation, which is a gravity-settling process that allows heavier solids to separate from fluid by collecting at bottom of a containment vessel such as settling ponds or a circular clarifier. Additional treatment is needed for the liquid and separated sludge. Flocculation is the addition of a chemical to a waste to enhance sedimentation and centrifugation, primarily for inorganic precipitation.

Phase separation refers to processes such as emulsion breaking and filtration. Emulsion breaking uses gravitational force to separate liquids with sufficiently different densities, such as oil and water. This process is enhanced by adding certain acids. Filtration is process of separating and removing suspended solids from a liquid by passing the liquid through a porous medium (see sludge dewatering). Polishing filtration, applied to wastewaters containing relatively low concentrations of solids, is used after chemical precipitation and settling/clarification of wastewaters containing inorganic precipitates to remove additional particles, such as those that are difficult to settle because of their shape or density.

Landfill

Land Disposal Methods

The *landfill* category includes landfill and surface impoundment disposal. Waste disposed in a landfill is placed on or beneath the surface of the ground and covered with soil or other material, to isolate the wastes from the environment. Landfills are required to have double liners, leachate collection systems, and ground-water monitoring programs. Wastes not permitted to be disposed in landfills include bulk or non-containerized liquid nonhazardous and hazardous waste, or free liquids containing hazardous waste. In addition, wastes such as acids must be segregated to prevent reactions with other wastes or waste constituents.

A surface impoundment is a natural topographic depression, man-made excavation, or diked area, such as a pond, pit, or lagoon, that can be used for disposal if the closure requirements for a landfill are followed. Surface impoundments are open on the surface and are designed to accumulate organic and inorganic liquid wastes, sludges, and slurries. Surface impoundments are now required to have double liners, leachate collection systems, and routine inspections[6].

Under the RCRA Land Disposal Restriction (LDR) program, hazardous wastes generally cannot be disposed in landfills or surface impoundments until after the waste has been properly treated. Thus, disposal facilities receive treatment residuals.

---

[6] 40 CFR 268.4

such as incinerator ash or stabilized wastes[7].

Data Issues

Unlike other CAP Management Categories, landfill capacity is non-renewable; that is, landfill capacity used in one year is not available in the next. (Thus, the units for capacity data are in tons not tons/year.) Without the addition of new landfill capacity by the siting of new facilities or expansion of existing facilities, landfill capacity declines over time.

The landfill capacity data include landfill cells that are not yet permitted, but are at landfills that are permitted and operating. Also, two states have imposed annual limits on the amount of hazardous waste that commercial landfills in their states can receive. The national assessment methodology assumes that these annual limits reflect the actual capacity in these states.

Deepwell/Underground Injection

Deepwell/underground injection is the disposal of hazardous wastewaters by injection into underground rock formations. Wastes are injected through bored, drilled, or driven wells, or through dug wells where the depth of the well is greater than its largest surface dimension. The disposal method relies on hydrogeological principles of the movement of liquids in layers of deep underground rock; the most desirable injection zone has sedimentary rocks with sufficient permeability, thickness, depth, and areal extent. Underground injection is most suitable for wastewaters that are low in volume and high in concentration, difficult and costly to treat by surface methods, biologically inactive, noncorrosive, free of suspended solids, and unlikely to react adversely with the rock strata or the fluid used to pressurize the wells. Much of the waste is pretreated to remove suspended solids or adjust the pH. As noted for the Landfill category, hazardous wastes generally cannot be disposed in underground injection wells unless the applicable LDR treatment standards are met[8]. Capacity amounts are determined by permit. Note that many of the wastewater treatment technologies are technically capable of also treating the wastes being disposed through deepwell and underground injection.

Land Treatment/Farming

Wastes disposed by ***land treatment/farming*** must meet LDR treatment standards and land treatment facilities must meet minimum technology standards[9]. his disposal method is only used at onsite and captive facilities; it is not used commercially and the National Assessment does not include projections for this CAP Management Category. Land treatment/farming is used to dispose of biodegradable hazardous wastes by depositing the wastes on or near the soil surface, mixing the wastes with the soil using conventional plow techniques, and allowing the wastes to be naturally decomposed by microbes such as algae and bacteria. The hazardous wastes, including organic liquid wastes and sludges, often require pretreatment before disposal to reduce or eliminate their hazardous attributes. The effectiveness of waste degradation is affected by many factors including the density and makeup of the microbe populations, which vary with soil depth and geographic location, and the care given to the waste after being deposited. The regulatory standards for this technology require the owner or operator to establish a program to ensure that hazardous constituents placed within the facility's treatment zone are degraded, transformed, or mobilized within that zone[10].

---

[7] 40 CFR 268.40

[8] 40 CFR 148.1

[9] 40 CFR 264.271

[10] 40 CFR 264.271

Transfer/Storage

This CAP Management Category captures those hazardous wastes that are shipped off site to transfer facilities which store the waste for short periods of time, sometimes bulking the waste with other shipments, and then shipping the waste to hazardous waste management facilities. The hazardous waste must be stored for less than 90 days, or the transfer facility becomes subject to the standards and permitting requirements for hazardous waste management facilities. If the waste is stored more than 10 days (but less than 90 days), the transfer facility is subject to the storage requirements of RCRA Subtitle C. If the waste is stored 10 days or less, the facility is subject only to transporter regulations[11]. Transporters that mix hazardous wastes with different Department of Transportation (DOT) shipping descriptions in the same container are classified as generators and must comply with the relevant RCRA Subtitle C regulations.

[11] 40 CFR 268.50