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Planning and Standards  
Research Triangle Park NC 27711

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July 1995

Air



# ANNUAL REPORT

## Control Technology Center

### FY94: Summary of Program Accomplishments

control technology center



**ANNUAL REPORT**

**CONTROL TECHNOLOGY CENTER**

**FY94: SUMMARY OF PROGRAM ACCOMPLISHMENTS**

Sponsored by:

Air Pollution Prevention and Control Division  
National Risk Management Research Laboratory  
Office of Research and Development  
U.S. Environmental Protection Agency  
Research Triangle Park, NC 27711

and

Information Transfer and Program Integration Division  
Office of Air Quality Planning and Standards  
Office of Air and Radiation  
U.S. Environmental Protection Agency  
Research Triangle Park, NC 27711

July 1995

**NOTICE: NAME CHANGE IN SPONSORING ORGANIZATIONS**

The Office of Research and Development (ORD) and the Office of Air and Radiation (OAR) reorganized in FY95 prior to completion of this report. As a result, the names of the Control Technology Center's (CTC's) sponsoring organizations within these offices have changed as follows:

for ORD

- former sponsoring organizational unit

Air and Energy Engineering Research Laboratory (AEERL),  
Office of Environmental Engineering and Technology  
Demonstration (OEETD), ORD

- current sponsoring organizational unit

Air Pollution Prevention and Control Division (APPCD),  
National Risk Management Research Laboratory (NRMRL), ORD;

for OAR

- former sponsoring organizational unit

Emission Standards Division (ESD),  
Office of Air Quality Planning and Standards (OAQPS)

- current sponsoring organizational unit

Information Transfer and Program Integration Division (ITPID),  
OAQPS.

To minimize confusion and to ensure that the CTC is correctly identified within EPA's existing organizational structure, this report uses the names of current organizational units, as indicated above, when referring to CTC sponsors.

## PREFACE

The Control Technology Center (CTC) is a cooperative effort between the U.S. Environmental Protection Agency's (EPA's) Office of Air and Radiation (OAR), Office of Air Quality Planning and Standards (OAQPS), Information Transfer and Program Integration Division (ITPID), and the Office of Research and Development (ORD), National Risk Management Research Laboratory (NRMRL), Air Pollution Prevention and Control Division (APPCD). The CTC provides technical assistance and technology transfer to State and local air pollution control agencies and to EPA's regional offices on air pollution control technology and pollution prevention applications. It also provides technical information to other governmental agencies, both foreign and domestic, and to private entities on a limited basis. Incorporated under the CTC umbrella are the RACT/BACT/LAER Clearinghouse (RBLC), technical support for the Federal Small Business Assistance Program (SBAP), and the International Technology Transfer Center for Global Greenhouse Gases (ITTCGGG).

The CTC produced this report to inform EPA management, staff, and other interested individuals of the status and activities of the CTC in supporting the Nation's air quality program. This report summarizes CTC projects and other program activities conducted between October 1, 1993, and September 30, 1994. Also program statistics are presented and analyzed to allow the EPA management staff to evaluate the Center's progress and effective-

ness. Finally, the report documents the demand for CTC support activities from businesses and governmental agencies.

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## LIST OF ABBREVIATIONS

ACT	Alternative Control Techniques
AEERL	Air and Energy Engineering Research Laboratory (now APPCD)
ALAPCO	Association of Local Air Pollution Control Officials
ANL	Argonne National Laboratories
APPCD	Air Pollution Prevention and Control Division (formerly AEERL)
BACT	Best Achievable Control Technology
BBS	Bulletin Board System
BLIS	RACT/BACT/LAER Clearinghouse Information System
CAA	Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CARB	California Air Resources Board
CEPPO	Chemical Emergency Preparedness and Prevention Office
CERI	Center for Environmental Research Information (now TTSD)
CFCs	Chlorofluorocarbons
CTC	Control Technology Center
CTG	Control Techniques Guideline
DOE	Department of Energy
EMTIC	Emission Measurement Technical Information Center
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
ESD	Emission Standards Division

## **LIST OF ABBREVIATIONS (continued)**

ESP	Electrostatic Precipitator
ETI	Environmental Technology Initiative
FY	Fiscal Year
GGG	Global Greenhouse Gases
GHG	Greenhouse Gases
HAP	Hazardous Air Pollutant
HCl	Hydrogen Chloride
HF	Hydrogen Fluoride
ITG	Information Transfer Group
ITPID	Information Transfer and Program Integration Division
ITTCGGG	International Technology Transfer Center for Global Greenhouse Gases
LAER	Lowest Achievable Emission Rate
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standard
NESCAUM	Northeast States for Coordinated Air Use Management
NOx	Oxides of Nitrogen
NRMRL	National Risk Management Research Laboratory
NTIS	National Technical Information Service
NTTC	National Technology Transfer Center
OAQPS	Office of Air Quality Planning and Standards
OAR	Office of Air and Radiation
ORD	Office of Research and Development
P2	Pollution Prevention

## LIST OF ABBREVIATIONS (continued)

PC	Personal Computer
PM	Particulate Matter
PM10	Particulate Matter Equal to or Less Than 10 $\mu\text{m}$ in Diameter
PPIC	Pollution Prevention Information Center
RACT	Reasonably Available Control Technology
RBLC	RACT/BACT/LAER Clearinghouse
SAGE	Solvent Alternatives Guide
SBAP	Small Business Assistance Program
SBO	Small Business Ombudsman
SIC/SCC	Standard Industrial Classification/Source Classification Codes
SIP	State Implementation Plan
STAPPA	State and Territorial Air Pollution Program Administrators
TTN	Technology Transfer Network
TTSD	Technology Transfer and Support Division (formerly CERI)
UNCED	United Nations Conference on Environment and Development
VOC	Volatile Organic Compounds

## **ACKNOWLEDGMENTS**

The Control Technology Center (CTC) acknowledges the efforts of all those who have contributed to the program's success. The Center especially recognizes staff members from the Office of Air Quality Planning and Standards (OAQPS) and National Risk Management Research Laboratory (NRMRL), who have enthusiastically responded to requests for assistance. The CTC Steering Committee and Advisory Work Group also have provided crucial support and guidance for the program's development. Representatives from OAQPS, NRMRL, the State and Territorial Air Pollution Program Administrators/Association of Local Air Pollution Control Officials (STAPPA/ALAPCO), and EPA's Technology Transfer and Support Division (formerly CERI) comprise the Advisory Work Group. The CTC also acknowledges the support and confidence shown by its many governmental and non-governmental clients. These clients have used the program's services with increasing frequency and have recommended the CTC to their colleagues in the air pollution control community.

## EXECUTIVE SUMMARY

### INTRODUCTION

Control Technology Center (CTC) services were accessed approximately 35,000 times in FY94, which is a 14 percent increase over activity experienced in FY93. This activity includes HOTLINE calls, access to computer bulletin board systems (BBSs) and databases, and requests for CTC products. This report summarizes the CTC's activities and accomplishments during FY94 and examines strategies to sustain this dynamic program.

### SUMMARY OF CTC ACTIVITY

The following table indicates CTC activity in FY94 and the change in activity from FY93.

SUMMARY OF CTC FY94 ACTIVITIES			
Activity	FY93	FY94	Change (%)
HOTLINE Calls - Government	1,258	1,208	-4
HOTLINE Calls - Non-Government	2,095	3,179	52
HOTLINE Calls - Total	3,353	4,387	31
RACT/BACT/LAER Clearinghouse BBS (RBLCL)	11,561	13,098	13
CTC BBS	8,480	12,291	45
Number of CTC Documents Requested	7,371	5,211	-29
<b>Total CTC Accesses</b>	<b>30,765</b>	<b>34,987</b>	<b>14</b>

## **CTC PROGRAM SERVICES**

A brief summary of CTC services and activities follows. The flow diagram on the next page graphically depicts CTC activities and coordination. More detailed information on each activity is provided in Section 2 of this report.

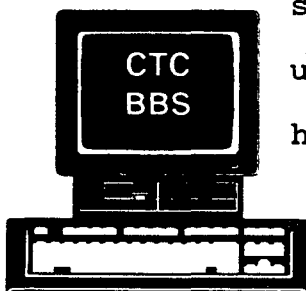
### **CTC HOTLINE**

The CTC's telephone HOTLINE provides quick access to EPA expertise and information. In FY94 HOTLINE activity increased by 31 percent, about a 41 percent increase in the rate of growth experienced in FY93. State, local, and federal government agency calls decreased slightly, but non-government HOTLINE calls continued to rise significantly and now represent 72 percent of all HOTLINE calls. This reverses the overall leveling off trend of HOTLINE activity experienced over the last few years which had been attributed to the growing popularity of CTC's electronic bulletin board systems (BBSs).



### **CTC BULLETIN BOARD SYSTEM**

The CTC BBS completed its third full year of service with a 45 percent increase in activity. The BBS supplements other CTC services. It allows users to download CTC products, request assistance, suggest projects, order hard copies of CTC products, or leave messages for other users. In FY94, nearly 58 percent of all users accessing the CTC BBS downloaded CTC



# CTC PROGRAM OPERATION

Federal, Regional, State, & Local Gov. Agencies/General Public/  
Foreign Gov. Agencies/Private Companies/Academia

CTC/RBLC/SBAP

25,000/yr

3,000/yr

7,000/yr

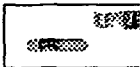
TTN BBS

Correspondence

CTC Hotline



EPA Expertise



25,000/yr

12,000/yr

13,000/yr

Coming in  
FY95



CTC BBS  
7,000 Products  
Downloaded

RBLC BBS  
3,000 Products  
Downloaded

SBAP BBS

Interaction

2,000/yr

CTC Staff

1,500/yr

OAQPS Staff

1,500/yr

NRMRL Staff

??

Sm. Bus. Assist. Prog.

??

ITTCGGG

10/yr

Tech. Assist. Projects

??

5,000/yr

CTC/SBAP/RBLC  
Products (documents,  
tools, etc.)

PPIC

EMTIC

CEPPO

Other EPA  
Offices

## Legend

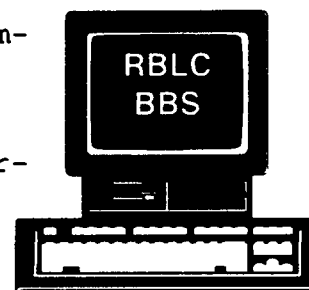
CTC Control Technology Center  
EMTIC Emission Measurement  
Technical Information Center  
CEPPO Chemical Emergency  
Preparedness & Prevention  
Office  
ITTCGGG International Technology  
Transfer Center for Global  
Greenhouse Gases  
NRMRL National Risk Management  
Research Laboratory  
OAQPS Office of Air Quality Planning  
and Standards  
PPIC Pollution Prevention  
Information Center  
RBLC RACT/BACT/LAER  
Clearinghouse  
SBAP Small Business Assistance  
Program

**Note:** All numbers are  
rounded off and indicate  
FY94 activity.

products compared to 33 percent in FY93. The BBS is part of the OAQPS Technology Transfer Network (TTN) and may be accessed 24 hours per day by anyone with a personal computer equipped with a modem and appropriate software.

#### RACT/BACT/LAER CLEARINGHOUSE

The RACT/BACT/LAER Clearinghouse (RBLC) is a repository for State and local agency control technology determinations. It can be easily accessed, by anyone with a personal computer equipped with a modem and communications software, for the price of a telephone call. During FY94, the RBLC was accessed 13,098 times, representing a 13 percent increase over FY93.



The RBLC also completed a number of improvements in FY94. These include: a new Regulation Data Base (NSPS, NESHAP, and MACT standards); a stand-alone, floppy disk version of the RBLC edit/data entry program to facilitate data submittal; and improved statistical data ranking capabilities to compare technology applications.

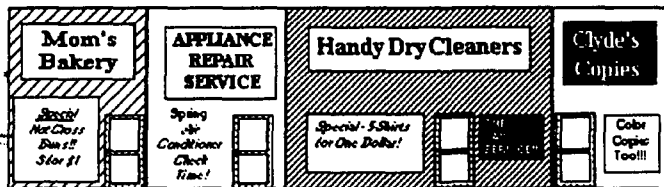
The RBLC is also in the process of implementing a number of additional improvements to be completed in FY95. These include: enhanced pollution prevention (P2) capacity; data base streamlining; an interactive RBLC tutorial to help new users; and additional improvements to statistical ranking capabilities.

Some of the improvements indicated above address recommendations made by the New Source Review Reform Work Group of the CAA

Advisory Committee. However, full implementation of recommendations dealing with quality control and the completeness and comprehensiveness of the data base is beyond the capabilities of the RBLC at current resource levels.

#### FEDERAL SMALL BUSINESS ASSISTANCE PROGRAM

The Federal SBAP provides technical support to and coordination with State SBAPs as required by section 507 of the CAA. The



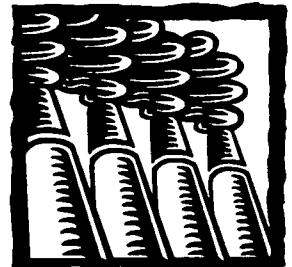
CTC is one of the primary technical support centers supporting the Federal SBAP.

Other centers include the Chemical Emergency Preparedness and Prevention Office (CEPPO), the Pollution Prevention Information Center (PPIC), and the EPA Small Business Ombudsman's (SBO) Office.

In FY94 the Federal SBAP undertook a variety of activities to provide the State SBAPs with materials and resources to assist small businesses in compliance with CAA requirements. This ranged from plain-English guidebooks to satellite downlink broadcasts. Another important activity of the Federal SBAP is to facilitate communication among the State SBAPs and EPA. To improve this communication, the National Small Business Technical Assistance Conference was held in Raleigh, NC, in January 1994, and work was started on the Small Business electronic bulletin board (SBAP BBS). The SBAP BBS will be available on the OAQPS TTN in FY95.

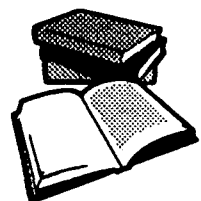
## ENGINEERING ASSISTANCE AND TECHNICAL GUIDANCE PROJECTS

The CTC funded 10 new technical guidance or engineering assistance projects during FY94. Most of these projects resulted from HOTLINE and written requests for technical assistance from State and local agencies. Three of these are joint ventures with State agencies which have allowed the CTC to conserve and leverage limited resources. In addition, the CTC completed eight projects covering a wide range of air pollution issues (two of these were initiated in FY94). They include evaluations of potential emissions from asphalt paving operations, combustion of scrap tire derived fuel and waste crankcase oil, new and emerging technologies for treating low concentration VOC/organic HAP emissions, and updates to CTC PC software for evaluating HAP control options and municipal landfill emissions.



## CTC PRODUCTS

As part of its technology transfer effort, the CTC distributed 5,211 reports and software tools that resulted from CTC projects. That represents a 29 percent decrease in hard copy products; however, many CTC clients are opting to download products from the CTC BBS instead of ordering them. In FY94, a total of 14,976 CTC products were provided to CTC clients (5,211 requests + 9,765 downloads) compared to 12,426 products provided in FY93 (7,371 requests + 5,055 downloads).



That represents an overall 20 percent increase in the amount of CTC products distributed while significantly reducing printing/duplication, handling and mailing cost.

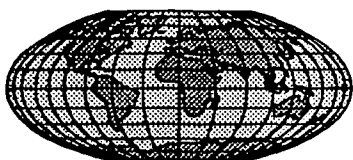
#### OUTREACH ACTIVITIES

The CTC conducted several outreach activities during FY94. More than 5,500 copies of CTC's quarterly bulletin, "CTC News," were mailed to CTC clients each quarter in FY94. In addition, the CTC participated in the Air and Waste Management Association national conference and several EPA workshops.



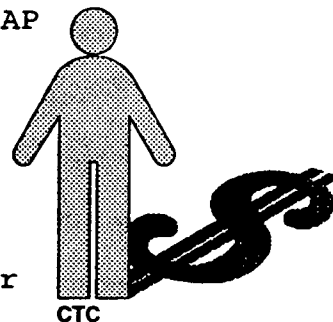
#### INTERNATIONAL TECHNOLOGY TRANSFER CENTER FOR GLOBAL GREENHOUSE GASES (ITTCGGG)

The ITTCGGG, a service provided by the APPCD, is linked to the CTC HOTLINE and product distribution activities. It provides technology transfer concerning greenhouse gas emissions. To date, modest funding has been provided to develop technology transfer tools for waste methane sources. The initial emphasis was on landfill methane because of soon-to-be-final emission rules for municipal solid waste landfills. Further highlights in the area include plans for a research symposium on greenhouse gas emissions planned for summer 1995. Technical assistance and information are available on landfills and other waste management sources, coal mines, the natural gas industry, small-scale combustion services (including coal stoves), and biomass utilization.



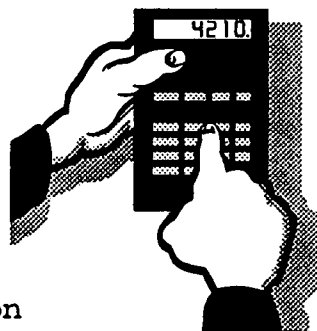
## RESOURCES

The CTC's budget for engineering assistance and technical guidance projects during FY94 was \$416,000. This amount is a 12 percent decrease from the \$475,000 budgeted in FY93 on projects. This does not include funding for the Federal SBAP and the RACT/BACT/LAER Clearinghouse (RBLC) program. These programs are funded under separate allotments not directly associated with CTC funding. The Clearinghouse expended \$100,000 for maintenance and improvements in FY94. The Federal SBAP's budget was \$230,000 to fund SBAP projects, informational material, develop a SBAP BBS, and to hold a national SBAP conference.



## PROGRAM DEVELOPMENT

The CTC is planning and implementing a number of initiatives including the following: building pollution prevention capacity; developing a new technologies electronic bulletin board; expanding cooperative projects with industry; developing cost recovery procedures under section 112(1)(3) of the Clean Air Act; developing capacity to evaluate intermedia impacts of air pollution control technology applications; establishing a SBAP BBS to facilitate coordination and exchange of small business materials among State SBAPs and EPA; and coordinating development of information targeted at small businesses.



## **SUMMARY**

The CTC continues to experience growth and program expansion. Although growth has moderated from the doubling of activity experienced in each of the previous three years, coping with even moderate growth and increases in customer demands represents a significant challenge as resources continue to decline. The CTC continues to explore emerging information transfer options that may be able to absorb growing customer needs without significantly impacting available resources.

The best indicator of CTC program success is still client use and access of CTC services. Although the rate of growth moderated considerably in FY94, a 14 percent increase was realized. Customer access to CTC services now exceeds 35,000 per year. This number does not adequately represent Federal SBAP assistance and coordination efforts in support of State SBAPs. SBAP program coordination and assistance has grown considerably, but a system to adequately measure the total number of accesses by State SBAP customers is not in place and, therefore, not included in the overall CTC program activity level.



## SECTION 1

### INTRODUCTION

This report summarizes the operation and accomplishments of the Control Technology Center (CTC) during FY94, its eighth successful year of operation. The report documents the program's efforts during this period to respond to increased demands for technical assistance and information from the pollution control community. It also discusses the growth and evolution of the CTC since its conception in 1987, as well as its efforts and plans to meet client needs in the future.

CTC program responsibilities include the RACT/BACT/LAER Clearinghouse (RBLC) and technical support to the Federal Small Business Assistance Program (SBAP) in addition to the Center's basic technical assistance/information transfer activities. The CTC also acts as a contact point for and distribution center of products prepared by the International Technology Transfer Center for Global Greenhouse Gases (ITTCGGG).

The CTC was originally established to support the U.S. Environmental Protection Agency's (EPA's) Air Toxics Strategy. The strategy called for State and local agencies to assume regulatory responsibilities for toxic air pollutants, with the EPA providing technical assistance to support their efforts. In response, EPA's Air Pollution Prevention and Control Division (APPCD) and the Office of Air Quality Planning and Standards (OAQPS) devel-

oped and implemented an innovative technology assistance and transfer program - - the CTC. In addition to supporting State and local agency air toxics programs, the CTC also was charged with providing technical assistance to these agencies on volatile organic compound (VOC) control issues to support their efforts to attain the national ambient air quality standard (NAAQS) for ozone.

The CTC's mission has expanded significantly over time. CTC staff have had responsibility for the overall RBLC program as an independent program activity since the CTC's inception; however, the interdependent relationship which developed between the CTC and RBLC proved to be extremely beneficial to both programs. The RBLC became an important tool in responding to CTC client requests for technical assistance about control technology and pollution prevention applicability and performance. At the same time, the CTC's technical assistance role proved to be a logical response to RBLC clients in need of more in-depth technical assistance. The expansion of the RBLC to include Reasonably Available Control Technology (RACT), as required by the 1990 Clean Air Act Amendments (CAAA), also resulted in a more interconnected relationship between these activities. Collecting and disseminating RACT information to State and local agencies supports efforts to attain the ozone NAAQS, which has been and continues to be an essential part of the CTC's mission. As a result, the CTC and the RBLC now function as one integrated program.

The CAAA also effected other significant changes. The most critical change was the extension of CTC services to non-governmental clients. The private sector now accounts for about 65 percent of the CTC's activities. In addition, because of its well-established role in assisting State and local agencies, EPA decided to make the CTC one of the primary technical support centers supporting the Federal SBAP required by section 507 of the CAA. The Federal SBAP provides technical support and coordination to State SBAPs.

New and emerging EPA policy and regulations and the changing needs of CTC clients require that the CTC continue to adapt and change. The CTC continues its efforts to expand pollution prevention capacity within its program and provide access to information on new and emerging technologies. As part of this effort to adapt and change, the Center proposed an innovative technology/pollution prevention information transfer system under the Environmental Technology Initiative (ETI) program to provide quick and timely information exchange among developers, vendors, industry, and regulatory agencies\*. The CTC also needs to develop capacity to consider cross-media implications of air pollution control applications, and the ability to work with industry in assessing new and emerging technologies.

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*\*Editor's Note: During final processing of this report, the CTC was notified that projects proposed under the Environmental Technology Initiative (ETI) for FY95 funding were not approved.*



## SECTION 2

### PROGRAM STATUS AND ANALYSIS

All CTC program services continue to increase in activity except the number of requests for paper and floppy disk copies of CTC products. The total number of direct accesses to CTC services in FY94 was about 35,000, a 14 percent increase over FY93. This total includes HOTLINE, BBS, and RACT/BACT/LAER Clearinghouse activity, and product requests from CTC clients.

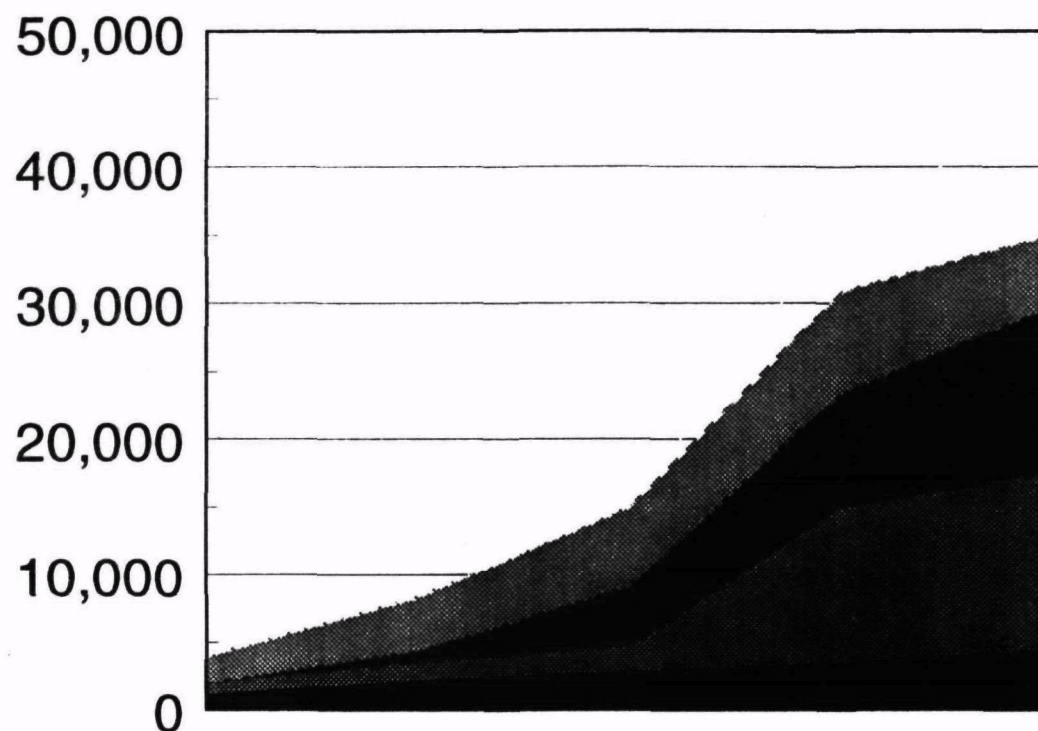
The decrease in the number of paper and floppy disk product requests is inversely related to an increase in the number of electronic versions of new CTC products downloaded from the CTC and RBLC BBSs. Therefore, it is apparent that CTC clients are downloading electronic versions of CTC products instead of ordering hard copies. In fact, the total number of CTC products provided to CTC customers increased from 12,426 (7,371 requests + 5,055 BBS downloads) in FY93 to 14,976 (5,211 requests + 9,765 BBS downloads) in FY94. Figure 1 summarizes the expansion of CTC activity over the last five years.

#### 2.1 The CTC HOTLINE

The CTC operates a telephone HOTLINE service staffed by technical experts from the sponsoring organizations. The HOTLINE provides callers with quick access to EPA air pollution control expertise during regular business hours (7:30 a.m. to 5:00 p.m. eastern time). Most



FIGURE 1. CTC ACTIVITY EXPANSION FY90 - FY94



	FY90	FY91	FY92	FY93	FY94
Total HOTLINE	1,097	2,068	2,750	3,353	4,387
RBLC	840	1,400	1,917	11,561	13,098
CTC BBS	0	866	4,440	8,480	12,291
Hard Products	2,000	4,000	5,899	7,371	5,211
Elec. Products	0	0	95	5,055	9,765

Note: Electronic products downloaded from the CTC and RBLC BBS are not included on the graph since they represent part of the overall activity already indicated for the BBSs. However, the table indicates a significant change in how customers acquire products and a significant increase in the overall demand for CTC products (hardcopy and electronic). See Section 2.6, CTC Reports and Software, for more information.

simple technical assistance requests can be addressed immediately by CTC staff. When a more detailed analysis or evaluation of a request is required, it is referred to an expert in the particular field.

The CTC initiated its computer tracking system for HOTLINE calls in FY87. Computer data and other early CTC records show a continued growth over the program's 8-year history. The HOTLINE received 4,387 calls for assistance in FY94 (this figure does not include telephone requests for CTC products). This represents an overall increase in HOTLINE activity of 31 percent, about a 41 percent increase in the rate of growth experienced in FY93. This reverses the overall leveling off trend of HOTLINE activity experienced over the last few years which had been attributed to the growing popularity of CTC's electronic bulletin board systems (BBSs). In FY94, both HOTLINE and BBS activity increased at a similar rate.

For the second consecutive year and the second time since the CTC began its HOTLINE, calls from State, local, and federal government agencies decreased slightly. Hotline calls from government agencies totaled 1,208 in FY94 compared to 1,258 in FY93 (-4 percent). The decrease is virtually identical to that experienced between FY92 and FY93 and appears to be the culmination of a gradual leveling off in government calls that has been experienced in recent years. However, overall access to CTC services by government customers through the HOTLINE, RBLC, and

CTC BBS continued to rise. For FY92, FY93, and FY94, the overall access to these three CTC services by government customers was 3,946, 8,342, and 10,562, respectively.

Non-government callers now represent 73 percent of all HOTLINE calls. Non-government HOTLINE calls increased from 2,095 in 1993 to 3,179 this year. This is a 51 percent increase over FY93 activity. Since the Clean Air Act Amendments of 1990 (CAAA) required that the CTC make its services available to others (i.e., other than government agencies) through FY93, the number of additional non-government calls each year had been constant and the rate of increase in these calls had been declining. In FY94 this trend changed significantly; that is, the rate of increase doubled compared to the FY93 rate.

Figure 2 shows the increase in HOTLINE calls over the past 5 fiscal years and the impact of private calls on the totals.

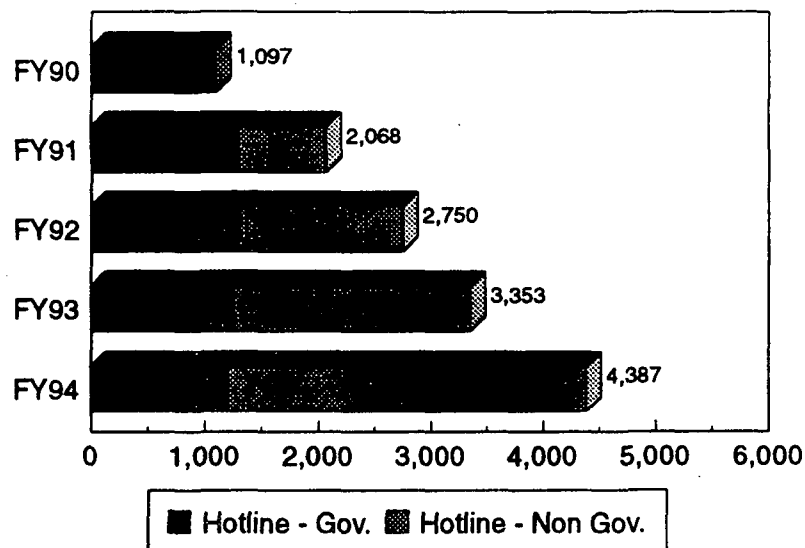


FIGURE 2. INCREASE IN CTC HOTLINE CALLS FY90 - FY94

Due to problems with the data base for non-government calls (lost data), an analysis of major topics of HOTLINE calls for technology assistance was limited to the governmental sector. The top five HOTLINE pollutant topics accounted for 76 percent of all calls that indicated a pollutant (See Table 1).

Pollutant	Percent of Calls
Volatile Organic Compounds (VOC)	33%
Hazardous Air Pollutants (HAPs)	22%
Particulate Matter (PM/PM10)	10%
Oxides of Nitrogen (NOx)	8%
Sulfur Compounds	3%
Total for Top Five Pollutants	76%

**TABLE 1. HOTLINE CALLS BY POLLUTANT**

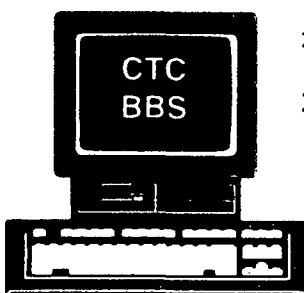
Subject/process area requests were very scattered, but 19 percent dealt with CTC products or activities (i.e., the RBLC and CTC program and products). The top five technical topics addressed printing and surface coating, emission factors, the Solvents Alternative Guide (SAGE), Emission Standards, and Control Technique Guidelines (CTGs). Table 2 presents the top 25 topics.

CTC Program & Products	12%	Control Technology (general)	2%
Printing & Coating Industry	8%	Clean Air Act	2%
RBLC	7%	IC Engines/Turbines	1%
Emission Factor	6%	Kilns	1%
SAGE	6%	Asphalt	1%
Emission Standards	5%	Wood Products	1%
CTGs	5%	Waste Water Treatment	1%
Solvents	3%	SBAP	1%
Boilers/Power Plants	3%	Fugitive Dust	1%
Incineration	3%	Operating Permits	1%
Emission Testing	3%	Degreasing	1%
Non-CTC EPA Products	2%	Iron & Steel	1%
Chemical Industry	2%		

**TABLE 2. TOP HOTLINE CALL TOPICS**

## 2.2 The CTC Bulletin Board System (BBS)

The CTC initiated an electronic BBS in August 1991. The system supplements the HOTLINE service which is provided only during normal business hours. The BBS system is operated and maintained by the Office of Air Quality Planning and Standards (OAQPS) Technology Transfer Network (TTN) BBS and can be accessed via a personal computer (PC) equipped with communication software and a modem. The BBS operates 24 hours a day, 7 days a week, except for routine maintenance on Mondays between 8:00 a.m. and noon eastern time. The BBS allows the user to



access CTC-generated technical reports and software, which may be downloaded to the user's PC. The user may also solicit input from other users by posting questions and requests on the BBS.

In FY94, the CTC BBS was accessed 12,291 times. That represents a 34 percent increase in activity over FY93. As with the CTC HOTLINE, non-government access to the BBS represents the largest share of use (58 percent). About 58 percent of all BBS accesses result in a download of a CTC report or CTC software, a 76 percent increase over FY93. Figure 3 and Tables 3 and 4 provide information on the user access, type of BBS activity, and the most popular downloadable items, respectively.

Type of Activity	Number of Events		
	FY92	FY93	FY94
Total Accesses	4,440	8,480	12,291
Total Downloads	1,385	2,796	7,077
Add to Mailing List	245	324	440
Document Orders	160	243	328
HOTLINE Requests	46	68	92
Project Suggestions	12	15	8

**TABLE 3. CTC BBS ACTIVITY**

Item	Number of Events		
	FY92	FY93	FY94
Document Text	228	658	1,342
MACT/CTG/NSPS/ACT Schedule Text	N/A	N/A	841
Solvent Alternative Guide (SAGE) -- CTC Software	N/A	391	800
CTC Newsletter	178	279	563
HAP-PRO -- CTC Software	256	285	561
LANDFILL Models -- CTC Software	172	219	278
Control Technology Guidelines (CTG) List	97	107	200

**TABLE 4. CTC BBS MOST POPULAR DOWNLOADABLE ITEMS**

## CTC BBS User Accesses

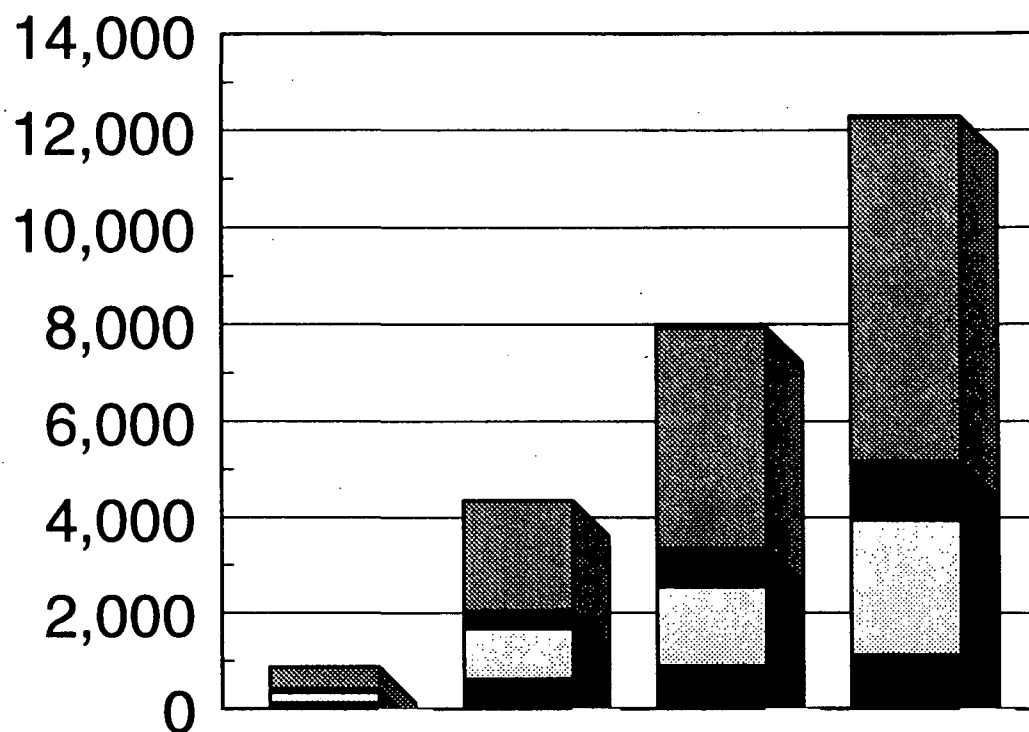
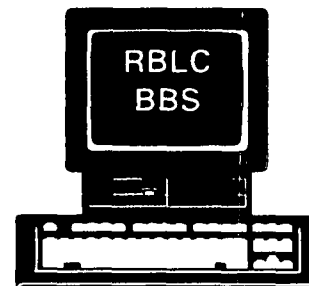


FIGURE 3. CTC BBS USER ACCESS

The CTC BBS has become an important and popular part of the CTC. It has allowed the CTC to expand its services and technology transfer capability with only a minimum impact on CTC resources. New CTC products are available as downloadable files from the BBS. This has improved user access to this information and reduced printing and document handling costs resulting from hard copy product requests. The CTC has also submitted an FY95 project proposal under EPA's Environmental Technology Initiative (ETI) that, if approved, would make the CTC BBS the home for a new control technology and pollution prevention data base that would allow users to identify and access information on new and emerging technologies.

### 2.3 RACT/BACT/LAER Clearinghouse

The RBLC is a repository for State and local agency control technology determinations.



It includes control technology determinations for:

- Major new or modified sources locating in nonattainment areas and subject to Lowest Achievable Emission Rate (LAER) control requirements
- Major new or modified sources locating in attainment areas and subject to Best Available Control Technology (BACT) requirements under the prevention of significant air quality deterioration program

- Existing sources located in nonattainment areas and subject to Reasonably Available Control Technology (RACT) requirements

The RBLC allows anyone with a PC, modem, and communications software to review, browse, and print examples of the types of controls and/or pollution prevention measures required or used on similar sources. In addition, the RBLC also contains the name, agency, and telephone number of a contact to obtain additional in-depth information on those sources.

During FY94, the RBLC was accessed 13,098 times, representing a 13 percent increase over FY93. Table 5, Figure 4, and Table 6 provide information on the type of access activity, user access, and the most popular downloadable items, respectively.

Type of Activity	Number of Events			
	FY91	FY92	FY93	FY94
Total Accesses	1,311	1,917	11,561	13,098
Total Downloads	N/A	N/A	5,555	7,394
Add to Mailing List	N/A	N/A	648	436
Document Orders	N/A	N/A	124	90
HOTLINE Requests	N/A	N/A	30	29

**TABLE 5. RBLC ACCESS ACTIVITY**

## RBLC User Accesses

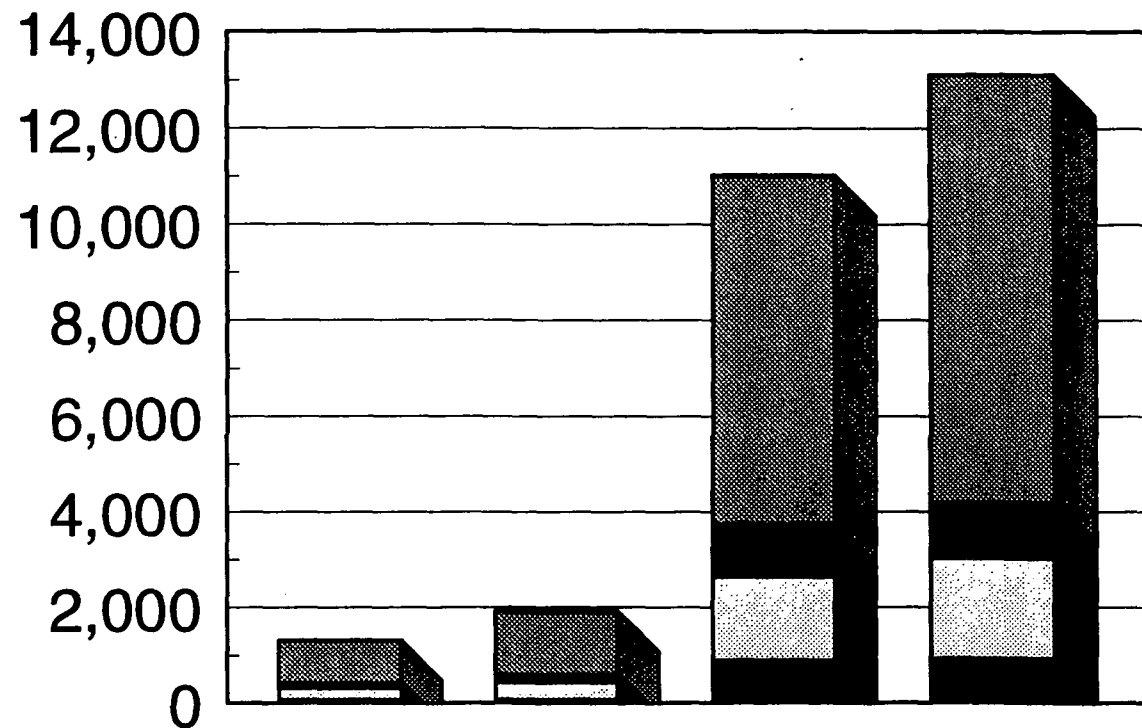


FIGURE 4. RBLC USER ACCESS

Item	Number of Events		
	FY93	FY94	Change (%)
User Generated Files (database search results)	3,296	4,706	43%
User's Manual	438	454	4%
Document Summaries	386	318	-18%
Informational Flier	235	313	33%
RBLC Supplement	N/A	454	N/A

**TABLE 6. RBLC MOST POPULAR DOWNLOADABLE ITEMS**

The RBLC completed a number of improvements in FY94, including:

- Regulation Data Base: A new data base which summarizes requirements of all EPA NSPS and NESHAP standards, including MACT standards, became operational in September 1994. For user convenience, regulation information is presented and searchable in a similar manner to that used in the source information data bases used in the RBLC BBS. State and local agencies will be able to add their key rules to this data base as of January 1995.

- Improved data submittal: A stand-alone, floppy disk version of the RBLC edit/data entry program is now available. The stand-alone program allows agencies to enter and compile data for new determination off-line on a PC. The information can then be sent to the RBLC electronically by uploading the file through the TTN BBS, or by mailing a floppy disk to the RBLC. This improvement provides a convenient alternative to the traditional on-line data

entry or paper copy submittals.

• Improved Statistical Ranking Capabilities: The RBLC is implementing an on-going program to specify standardized emission units so that users can fully utilize the statistical ranking capabilities that are part of the system. These improvements allow users to present and rank technology applications according to their ability to minimize pollution. In FY94, standardized emission units affecting nine pollutants and 19 source categories were established.

Another planned improvement which would have provided direct computer-based data transfer between the California Air Resources Board (CARB) Clearinghouse and the RBLC met with limited success. A fully compatible system could not be developed in spite of the best efforts of the RBLC contractor, the CARB and the RBLC staffs. However, the stand-alone version of the RBLC noted above has proved useful and is being used by CARB to facilitate data submittal.

The RBLC is also in the process of implementing a number of additional improvements, including:

• Enhanced Pollution Prevention (P2) Capacity: The RBLC is enhancing its ability to include and search for P2 applications. This includes the capability for user-initiated standardized searches on P2 criteria and improved quality of P2 data in the

current (most recent five years) data base. These improvement come on-line in March 1995.

- Data Base Streamlining: The RBLC is actively reassessing the need for and use of a number of noncritical data fields currently in the system. By the end of 1995, the RBLC will trim extraneous information fields from the data base to avoid any undue burden to agencies entering determinations and rules and to encourage submittals. This improvement will also help other users by enhancing the quality and searchability of RBLC data bases.

- Interactive RBLC Tutor: The RBLC is developing an interactive PC program to familiarize new users and refresh long time users with RBLC capabilities and procedures.

- Improved Statistical Ranking Capabilities: The RBLC is continuing its program to specify standardized emission factors so that users can fully utilize the statistical ranking capabilities that are part of the system. These improvements allow users to present and rank technology applications according to their ability to minimize pollution.

In addition, RBLC staff provided information to the New Source Review Reform Work Group, part of the Clean Air Act Advisory Committee, to facilitate its work. The Work Group concluded and the committee recommended that the RBLC be approved and expanded. Many of the recommendations, if implemented, would make

the Clearinghouse more comprehensive and complete with regard to new source permitting actions and emerging emission control technologies. Some of these improvements have been or are being addressed through the efforts indicated above; however, significant new resources are required to fully implement many of the recommendations, especially those dealing with quality control, completeness, and comprehensiveness of the data base. These improvements are beyond the resource capability of the RBLC at this time.

#### 2.4 Federal Small Business Assistance Program (SBAP)

Under Title V, Section 507 of the 1990 CAAA, EPA is required to provide assistance to the State Small Business Stationary Source Technical and Environmental Compliance Assistance Programs. The Federal SBAP is a coordinated effort among several



existing EPA technical service centers, with the CTC serving as the focal point for coordination of efforts

among the participating groups, as well as the contact point for general Office of Air and Radiation (OAR) small business assistance activities. The Agency's assistance centers associated with this program include: the CTC, the Chemical Emergency Preparedness and Prevention Office (CEPPO) (Emergency Planning and Community Right-to-Know Information Hotline), the Pollution Prevention Information Center (PPIC), and the EPA Small Business

Ombudsman's (SBO) Hotline. These centers have expanded their services to provide support to State and local agency SBAPs which were to have been fully operational no later than November 1994. The centers will also be able to assist small businesses in understanding and complying with CAAA requirements in their respective program areas. Federal SBAP activities for FY-94 include:

- Distribution of the brochure "New Regulation Controlling Emissions from Dry Cleaners." Preparation of similar brochures began for the "Halogenated Solvent Degreasing" and "Chromium Electroplating and Anodizing" NESHAP rules. Also underway are follow-up guidebooks that explain options available for compliance, including pollution prevention alternatives, and present example calculations and example reporting and recordkeeping forms. Development of additional materials will begin in FY95 to accompany the rules for wood furniture manufacturing, architectural & industrial maintenance coatings, and printing & publishing.

- Participation, along with EPA's Air Pollution Training Institute, EPA's Small Business Ombudsman, and the University of Tennessee, in the development and organization of a satellite downlink teleconference for the dry cleaner industry.

- Sponsorship of the National Small Business Technical Assistance Conference in Raleigh, NC. The 1995 meeting will be a joint effort with EPA's Small Business Ombudsman, to be held in New Orleans, LA, in January.

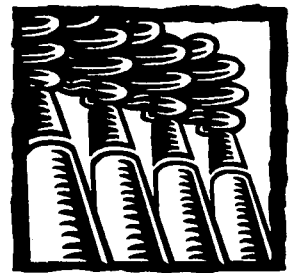
- Development of the Small Business electronic bulletin board (SBAP BBS), to be available in FY-95 on the OAQPS TTN. This system is designed to help State SBAPs share information.
- Working with the Florida SBAP on a project to address environmental auditing, with an emphasis on self-auditing. This effort has been coordinated with additional auditing initiatives being carried out by the Iowa SBAP and the EPA Small Business Ombudsman.
- A project (jointly with the CTC) to evaluate a potential pollution prevention technology to control emissions from small grain elevators. Also participating in this effort are the Emissions, Monitoring, and Analysis Division, as well as the Nebraska air agency and the Nebraska Small Business Advocate.
- Development of a "Leadership Grants to the State Small Business Assistance Centers" program to support model projects that emphasize pollution prevention as the preferred approach, and consider cross-media impacts. This effort will be coordinated with EPA's Pollution Prevention Division, with the grants being awarded in FY-95.
- Coordination with EPA's Pollution Prevention Division in the development of a "special agenda" for the State 507 programs at the November 1994 and April 1995 meetings of the National Roundtable of State Pollution Prevention Programs. These ses-

sions will focus on pollution prevention issues and coordination with the State pollution prevention programs.

## 2.5 TECHNICAL PROJECTS

The CTC initiated 10 projects in FY94. Appendix A provides a brief description of these projects. They include:

- Two program administration/quality control projects designed to monitor, track, support, and improve the operation of the CTC and its projects;
- Six engineering assistance projects in response to requests received from various State and local governmental agencies;
- Two technical guidance projects in response to HOTLINE requests and the need to upgrade existing CTC products.



Direct engineering assistance projects are initiated when a State or local agency requests technical assistance in specific areas (either through the HOTLINE or by written request). These projects are usually short-term, taking 6 months to complete, and involve the evaluation of emissions, emission control technologies, or pollution prevention methods for certain operations. Technical guidance projects result from multiple HOTLINE requests for technical assistance in a particular topical area. The

projects are usually long-term, taking about one year to complete, and are applicable to a broad client base. Except for a few joint efforts with other agencies, the Center generally conducts both types of projects for governmental clients free of charge pending the availability of funds. However, in FY94, the CTC entered into several joint ventures with other agencies in order to conserve and leverage limited resources. Partners in these joint ventures included the Vermont Agency of Natural Resources, the New York State Department of Environmental Conservation, and the Wisconsin Department of Natural Resources. The Center will continue to aggressively seek out these joint ventures to leverage its limited project budget.

The CTC also completed eight technical projects in FY94. They include four projects initiated in FY94, two projects initiated in FY93, and two projects initiated prior to FY93. These CTC products completed in FY94 address a wide range of issues including: emissions from combusting scrap tire derived fuel; analysis of and emissions from the combustion of waste crankcase oil; emissions from asphalt paving operations; and new and emerging technologies to treat low concentration VOC/organic HAP air emission streams.

The CTC also completed two software upgrades. The CTC completed the second upgrade of its popular software tool, HAP-PRO. HAP-PRO is a PC-based program that helps users evaluate control options for HAPs. The "Municipal Landfill Air Emissions Model"

upgrade was also completed. This software helps users estimate potential emissions from municipal landfills and is designed to complement the municipal landfill NSPS. Release of the revised model is awaiting promulgation of the final rule for municipal landfills. A complete list of projects completed in FY93 is provided in Appendix B.

Currently the CTC only accepts projects requested by government agencies (primarily State and local air pollution control agencies). Projects requested by "others" (i.e., non-government clients) are not accepted because, to date, neither cost recovery procedures required under Section 112(1)(3) of the Clean Air Act nor Federal funding to conduct such projects has been provided for this client group. However, the CTC has entered into several joint agreements with "others," including:

1. An agreement with the Electric Power Research Institute (EPRI) to jointly develop PC-based software to evaluate and design electrostatic precipitators (ESPs). The CTC provided an existing internal EPA ESP evaluation program and technical expertise. EPRI provided programming expertise and resources. A comprehensive ESP design model has been developed and is available through the CTC BBS, free of charge, to anyone wishing to download it. This comprehensive model is the property of EPA. EPRI is still refining a less sophisticated, user-friendly version. The EPRI version is the property of EPRI; however, a licensing agreement between EPA

and EPRI will allow the CTC to distribute this version to State and local agencies free of charge.

2. An agreement with Weatherly, Inc., the distributor of The Polyade® FB Process, and Eljer Plumbingware, Inc., to test and evaluate the effectiveness of Weatherly's styrene emission control system. Weatherly provided a Polyade® FB control system and transportation, installation, operation, and removal of the system from the site of the Eljer Plant in Wilson, NC. Eljer provided emissions from its manufacturing process and on-site utilities needed to operate the control system. EPA provided for stack testing and generated an independent report evaluating the performance of this control system in treating styrene emissions.

3. An agreement with QUAD Environmental Technologies, manufacturer of the QUAD Chemtact™ System, and Eljer Plumbingware, Inc., to test and evaluate the effectiveness of QUAD's styrene emission control system. The arrangement was basically the same as that described in 2, above.

These projects, especially 2 and 3, above, were very significant. They demonstrated the CTC's ability to work with the private sector and produce an independent evaluation of emerging control technology. Control of styrene, a hazardous air pollutant (HAP), has been troublesome for more conventional control systems because of cost or technical feasibility issues. The CTC

hopes to continue this type of project because it puts the CTC on the cutting edge of technology and provides valuable information to industry and regulatory agencies wrestling with air pollution control questions. The CTC would also like to pursue the establishment of cost reimbursable procedures which may facilitate future evaluation of emerging technologies and eliminate or minimize CTC costs.

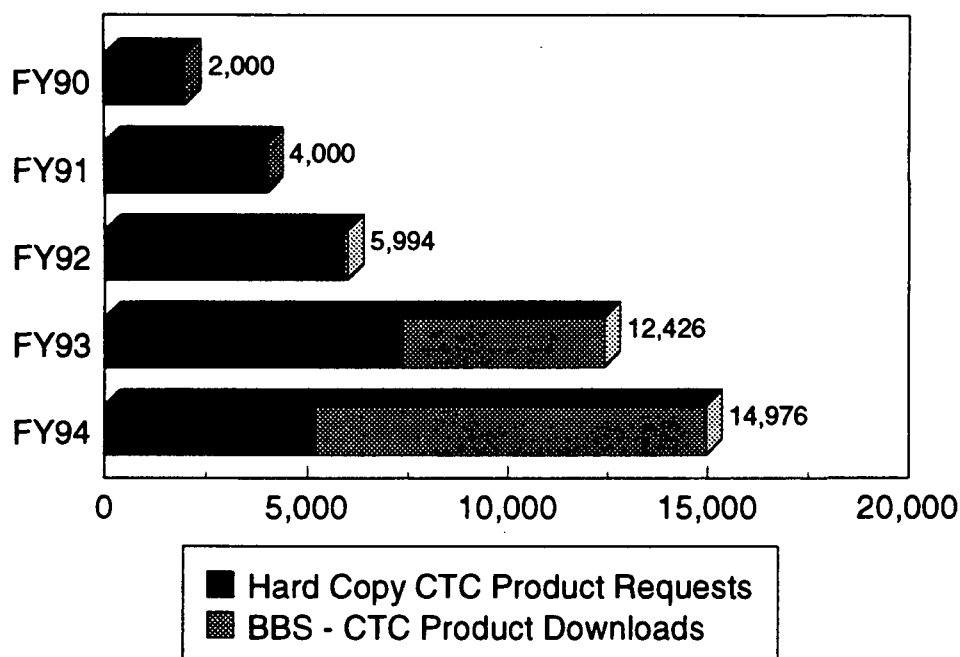
## 2.6 CTC REPORTS AND SOFTWARE

Another major CTC technology transfer and support effort is the distribution of over 130 documents and software tools developed from CTC technical assistance projects. Governmental air pollution control personnel can request copies of CTC technical guidance tools through the HOTLINE or the BBS. The CTC also annually publishes a list of its most recent resource materials in the "CTC News." Governmental clients receive the available reports and software systems at no charge. Non-governmental clients receive information on ordering these items from the National Technical Information Service (NTIS). In addition, many of these items can be downloaded by both governmental and non-governmental personnel through the CTC BBS at the cost of a telephone call. The CTC mailed 5,211 technical assistance reports and computer disks to clients in FY94. That represents a 29 percent decrease in hard copy products; however, many CTC clients are opting to download products from the CTC BBS instead



of ordering them. In FY94, a total of 14,976 CTC product were provided to CTC clients (5,211 requests + 9,765 downloads) compared to 12,426 products provided in FY93 (7,371 requests + 5,055 downloads). Figure 5 compares hard copy vs. BBS download distribution of CTC products. That represents an overall 20 percent increase in the amount of CTC products distributed while significantly reducing printing/duplication, handling, and mailing costs. The increasing number of publications and software distributed by the CTC each fiscal year is evidence of the respect that the CTC products have gained. Titles of CTC reports and software available through the end of FY94 are listed in Appendix C.

The CTC is also using its bulletin board to distribute the PC program "Solvent Alternative Guide" (SAGE), version 2.0. This software tool was developed by staff at APPCD, one of the CTC's sponsoring organizations. SAGE is an expert system that helps the user identify more environmentally friendly solvents by answering basic questions about the product being manufacturing, the material being dealt with, and the processes involved. As noted in the CTC BBS section, SAGE is a very popular downloadable item. About 800 copies were downloaded from the BBS in FY94. In addition, disks were provided initially to governmental organizations which did not have a download capacity.



**FIGURE 5. CTC PRODUCT DISTRIBUTION: HARD COPY VS. BBS DOWNLOADS**

## 2.7 OUTREACH ACTIVITIES

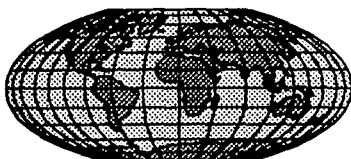
The CTC publishes the "CTC News" quarterly to inform its audience of available services, the status of CTC projects, and other activities related to air emissions and control technology. It identifies new projects and those nearing completion. The CTC News also highlights EPA staff members who respond to assistance requests. The quarterly publication often solicits from its readers information related to ongoing projects or requests for CTC assistance and suggestions of how the program may better serve their needs. In FY94, the "CTC News" reached a mailing list of more than 5,500 per quarter, a 10 percent increase over the FY93 mailing rate.



In addition to the "CTC News," the Center updates clients and informs potential users of its services by conducting briefings at EPA regional offices and other locations. In FY94, the CTC staff attended workshops and conferences such as: the SBAP Technical Assistance Conference, OAQPS Air Toxics Workshop, and the Air and Waste Management Association Conference. As appropriate, program briefings, seminar and conference presentations, or interactive displays were used to highlight or promote CTC program objectives and services.

## 2.8 INTERNATIONAL TECHNOLOGY TRANSFER CENTER FOR GLOBAL GREENHOUSE GASES (ITTCGGG)

The United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in June 1992, created an unprecedented need for rapid and effective transfer of technology and information regarding emissions measurement methodology and inventory development, and technology development, demonstration, and deployment. The EPA and the U.S. technical community have extensive expertise on greenhouse gas (GHG) emissions and con-



trols. This will continue to grow as the global change research program progresses. The goal of the ITTCGGG is to provide access to this expertise and to respond to incoming requests both domestically and internationally for information on GHG emissions.

A modest program within APPCD has already begun to provide information on emissions and strategies to a variety of information users. In 1992, ITTCGGG was established in cooperation with EPA's CTC. Since its inception in May of 1992, ITTCGGG has received hundreds of calls and requests for information. FY91 and FY92 funding was applied to developing an EPA report on the technical options and case studies on landfill gas utilization. To date, more than 1,100 copies of this report have been distributed. A follow-up report is being developed that contains information on landfill gas to energy projects in North America, Europe, and Australia. This report provides an overview of the different philosophies about gas cleanup and energy equipment modifications for landfill gas utilization. Information in this report is being provided through the International Energy Agency Expert Working Group on Landfill Gas, in which APPCD participates. Another accomplishment is APPCD's first symposium on GHG emissions and mitigation research which was held in Washington, DC, in August 1992 and was attended by more than 300 participants. A second research symposium is planned for the summer of 1995.

Information on the following subjects is available through ITTCGGG:

- Landfills and other waste management facilities, the natural gas industry, and coal mining

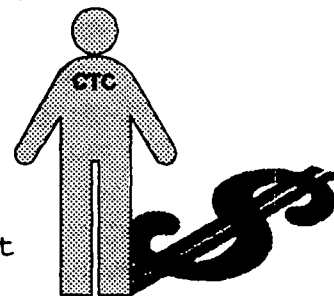
- Biomass utilization for energy generation and production of liquid fuel and for pollution prevention technologies
- Energy conservation and pollution prevention technologies for residential, commercial, industrial, and utility application.



## SECTION 3

### PROGRAM RESOURCES

The CTC has a small, dedicated staff. However, to accomplish its mission, the CTC draws from the staff expertise and talent of its sponsoring organizations, APPCD and OAQPS. Additional resources and expertise are provided through EPA contractors when appropriate and necessary. This section addresses the CTC's staff resources and the CTC's contract budget.



#### 3.1 STAFF RESOURCES

The sponsoring organizations provide nine staff members to support CTC activities. Five of these are EPA employees. The remaining four are senior environmental employees working under an EPA assistance agreement. Although these nine CTC staff members are assigned primarily to the CTC, some of their time is used to support projects and activities that are part of the sponsoring organizations' missions and not part of the CTC program. Also, some of the senior environmental employees work less than a 40 hour week. It is estimated that the equivalent of 7.1 person years of effort were used to support CTC activities in FY94. Table 7 indicates the distribution of staff time among the CTC's three major components.

Sponsoring Program	CTC Base Program	RBLC	SBAP	Total
ITPID/OAQPS	1.70	1.20	1.20	4.10
APPCD/ORD	2.90	0.00	0.10	3.00
TOTAL	4.60	1.20	1.30	7.10

**TABLE 7. Distribution of CTC Staff Resources (Person Years)**

### 3.2 PROJECT BUDGET

The CTC expended \$354,000 of its \$416,000 budget on engineering assistance and technical guidance projects during FY94. In fact, all of the budgeted funds had been approved by the CTC Steering Committee for project work, but an administrative issue prevented the transfer of needed funds between the sponsoring organizations. As a result, two cooperative projects between the CTC and State agencies were postponed until FY95. It appears that the administrative issue which prevented the transfer has been resolved and should not be a problem in the future.

The FY94 contract budget represents a 12 percent decrease from the \$475,000 the CTC expended on projects in FY93. This amount does not include funding for the Federal SBAP and the RACT/BACT/LAER Clearinghouse program which have independent funding.

More than 89 percent of the FY94 expenditures were used to

fund technical guidance and engineering assistance projects. The remaining expenditures covered CTC administrative costs, such as publishing the "CTC News," maintaining the CTC HOTLINE database, and mailing documents. The program's FY93 administrative costs of \$60,000 decreased to \$43,800 in FY94.

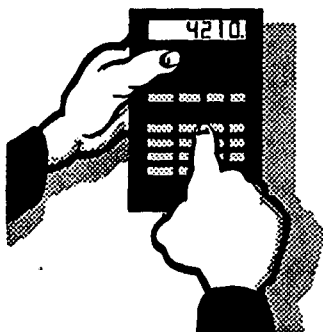
As noted above, the RBLC and the SBAP programs are funded under separate allotments not directly associated with CTC funding. The RBLC expended \$100,000 for maintenance and improvements in FY94. The Federal SBAP budget was \$230,000. The distribution of CTC contract resources in FY94 is indicated in Table 8. Based on budget trends over the past three years, it is anticipated that the FY95 budget for the CTC, RBLC, and SBAP will decrease 10 to 20 percent from FY94 levels.

Program	Amount (Dollars)
CTC Base Program	\$416,000
RBLC	\$100,000
SBAP	\$230,000
Total Contract Resources	\$746,000

**TABLE 8. CTC Contract Resources for FY94**

SECTION 4  
PROGRAM DEVELOPMENT

In FY94, the CTC planned to begin expanding its capacity to serve the needs of its clients based on three major EPA initia-



tives -- pollution prevention, encouraging new and innovative technologies, and intermedia impacts. This CTC plan for the future goes well beyond FY94. However, the CTC hoped to make significant strides in implementing and attaining these initiatives in the near fu-

ture. CTC expansion goals, FY94 accomplishments, and activities planned for FY95 and beyond include:

1. GOAL: Build pollution prevention capacity within the CTC to assist SBAPs and other CTC clients.

FY94: Modified the RBLC to enhance pollution prevention information fields and data search capabilities.

FY95: Develop contacts with other government centers to share information and to establish links with existing pollution prevention information centers. Also explore opportunities resulting from ORD's reorganization which places the ORD part of the CTC in an organizational structure with existing P2 capabilities.

2. GOAL: Expand the CTC BBS to include information on new and emerging technologies (both add-on and P2). This goal also

responds to recommendations made by the Clean Air Act Advisory Committee for improving the RBLC.

FY94: Submitted a project proposal under the Environmental Technology Initiative (ETI) for FY95 funding\*.

FY95: Explore other opportunities for partnerships with industry and trade associations to develop an innovative technology BBS.

3. GOAL: Expand efforts to conduct new technology assessment projects in cooperation with industry. These projects help define the technical and economic feasibility of new technologies as they relate to the control or elimination of specific waste/emission streams.

FY94: Submitted a project proposal under the Environmental Technology Initiative (ETI) for FY95 funding\*. The proposal targeted assistance to small businesses in their efforts to document the effectiveness and cost of technologies they had developed. The CTC also completed a technical guidance project identifying and verifying the use of emerging technologies to treat low concentration VOC/organic HAP air emission streams.

FY95: Continue to explore opportunities to work with industry and technology developers to evaluate the performance and capabilities of promising emerging technologies.

4. GOAL: Explore the development of policy, procedures, guidance, and rules implementing the "cost recovery" provi-

sions of section 112(1)(3) of the CAAA. This could give the CTC and other centers responding to the requirements of this section expanded capability to consider and implement projects requested by the private sector.

FY94: Gathered information on the legislative history and intent of Section 112(1)(3) and explored similar cost recovery provisions in the CAA and other statutes. Also requested the Office of General Counsel review our findings and provide a legal determination and guidance needed to develop agency policy on this issue.

FY95: Pending a response from the Office of General Counsel, direct development of agency policy, procedures, and regulations, as appropriate, to implement cost recovery provisions.

5. GOAL: Develop capacity to consider intermedia implications of air pollution control technology applications.

FY94: Conduct preliminary evaluation of resources needed to consider intermedia implications of air pollution control technologies.

FY95: Explore opportunities resulting from ORD's reorganization which places the ORD part of the CTC in an organizational structure with considerable intermedia capabilities.

6. GOAL: Establish a SBAP BBS to provide an avenue for State and local SBAPs and EPA to share materials developed for

small businesses.

FY94: Continued BBS development work and collected materials and information on materials to be provided on the BBS.

FY95: Make the SBAP BBS operational.

7. GOAL: Coordinate development of informational materials targeted at small businesses that will explain, in layman's terms, new regulatory requirements as well as applicable P2 and control options.

FY94: Distributed informational brochure for dry cleaners and began work on brochures and guidebooks for degreasing and chromium electroplating rules. Also began work with the Florida SBAP to develop self-auditing guidance for small businesses.

FY95: Complete brochures and guidebooks started in FY94 and initiate new projects, as appropriate, to address other new rules affecting small businesses.

The CTC also has begun the task of rethinking its mission and goals in light of new Agency initiatives, increased customers, changing customer needs, and decreasing resources. The CTC hopes to complete this effort in FY95 and present options to OAQPS and APPCD senior management.

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*\*Editor's Note: During final processing of this report, the CTC was notified that projects proposed under the Environmental Technology Initiative (ETI) for FY95 funding were not approved.*

## SECTION 5

### CONCLUSIONS

The CTC continued to grow in FY94, but at a slower rate. In each of the previous three years, access to CTC services more than doubled that of the previous year. In FY94, access to CTC services increased at a more moderate rate of 14 percent. This growth was due primarily to the increase in electronic bulletin board activity by the CTC BBS (45% increase) and the RBLC (13% increase), and the continued significant growth in non-government HOTLINE calls (52% increase).

Overall CTC HOTLINE activity increased by 31 percent but showed a significant change in clientele. Private sector, non-government agency calls now account for 73 percent of all HOTLINE calls. Non-government calls increased by 52 percent over FY93 levels, while calls from government agencies decreased by 4 percent compared to the same period. Since the passage of the Clean Air Act Amendments of 1990, calls from government agencies have leveled off and remained fairly constant, while non-government calls have risen significantly.

Requests for hard copies of CTC products decreased by 29 percent, but the total of hard copy requests and electronic downloads of CTC products from the CTC BBS and RBLC increased by 20 percent. This indicates that many CTC customers are opting to download products rather than request hard copies. Downloading

provides almost immediate access to CTC products at a nominal cost -- the price of the telephone call to the TTN BBS. The use of the CTC BBS is being encouraged to reduce printing costs and resources required to handle and mail documents.

Virtually all State SBAPs became operational in FY94 and created a significant demand on the Federal SBAP. Work continues on the SBAP BBS which will provide a much needed avenue for State and local SBAPs and EPA to share material developed to assist small businesses. The Federal SBAP, in coordination with EPA's Small Business Ombudsman (SBO), also sponsored the National SBO/SBAP Conference. Also underway is the development of additional informational brochures and guideline documents, and technical assistance projects targeted to help the State SBAP programs and small businesses affected by EPA regulations. The Federal SBAP also began development of "Leadership Grants to State Small Business Assistance Centers" to support model projects that emphasize pollution prevention and multimedia assistance.

The continued increases in access and use of CTC services indicate that the CTC is successfully responding to the ever-increasing demand for air pollution control information. However, this level of activity and growth is taxing the CTC's resources and ability to fully respond to customer needs.

## **APPENDIX A**

### **CONTROL TECHNOLOGY CENTER PROJECTS**

#### **STARTED IN FY94**

##### **94-1 Administrative Support**

This project covers the maintenance of the CTC data base and supply of CTC documents and software products.

##### **94-2 Quality Assurance**

This project provided for on-going quality assurance support by the Air Pollution Prevention and Control Division (APPCD), National Risk Management Research Laboratory (NRMRL), Office of Research and Development (ORD), for CTC projects involving sampling and analysis.

##### **94-3 Landfill Model Software Upgrade**

Completed project; see Appendix B.

##### **94-4 Waste Oil Combustion**

Completed project; see Appendix B.

##### **94-5 Copper/Manganese Catalyst Evaluation**

Completed project; see Appendix B.

##### **94-6 New Technology for Low VOC Streams**

Completed project; see Appendix B.

94-7 Emissions from Open Burning/Air Curtain Incineration of Construction Site Clearing Waste

This project was requested by Broward County, Florida, to assist them in evaluating the need to regulate the burning of waste derived from construction site clearing activities. Broward County provided waste samples. The APPCD simulated open burning conditions and tested and analyzed emissions at their test facility.

94-8 Emissions from Barrel Burners Used for Household Waste

This project is a cooperative effort requested by the New York State Department of Health to evaluate emissions from the combustion of household waste, in barrels or drums, by residents in rural areas. New York is providing waste samples, APPCD is simulating barrel combustion and collecting emission samples, and both New York and APPCD are sharing responsibility for sample analysis.

94-9 Emissions from External Residential Wood Boilers

This project, requested by the Wisconsin Department of Natural Resources, evaluates emissions from residential wood-fired boilers. These boilers are not covered by existing Federal or State regulations, according to the WI DNR, and have been the subject of numerous complaints. APPCD is conducting test burns at its wood stove combustion laboratory in representative boilers to determine potential emissions. Wisconsin plans on using these data and other related information in the literature to determine

if this type of source should be regulated.

#### 94-10 HAP-PRO Software Improvement

This project will correct deficiencies and upgrade the CTC's existing HAP-PRO software. This software is used to evaluate alternative control measures for treating hazardous air pollutants. It provides efficiency, design, and cost information for nine alternative control systems based on source specific information provided by the user. The improvements will upgrade the program and the way it interacts with alternative control modules to facilitate use and future module additions and upgrades. The overall system also will be upgraded to provide better overall operation and improve user-friendliness.



## **APPENDIX B**

### **CONTROL TECHNOLOGY CENTER PROJECTS**

#### **COMPLETED IN FY94**

91-13 "Pilot Scale Evaluation of the Potential for Emissions of Hazardous Air Pollutants from Combustion of Tire-Derived Fuel," EPA-600/R-94-070, PB94-169463

Experiments were conducted in a rotary kiln incinerator simulator to examine and characterize emissions from incineration of scrap tires. The purpose of this project was to generate a profile of target analytes for full-scale stack sampling and give insight into technical issues and fundamental phenomena related to controlled combustion of scrap tires. Overall, it appears that, with the exception of zinc, potential emissions from tire derived fuel combustion are not significantly different from combustion of conventional fossil fuels, when burned in a well-designed and well operated combustion device. If unacceptable particulate loading occurs due to zinc emissions, the emissions would have to be controlled by an appropriate particulate control device.

92-14 "Evaluation of Emissions from Paving Asphalts," EPA-600/R-94-135, PB95-129110

This report provides data from pilot-scale measurements of emissions of specific pollutants from paving asphalts, both with

and without crumb rubber additives. The methods used in this work measured emissions from a static layer of asphalt maintained for a period of several hours near the highest temperature likely to be encountered in a real paving operation. In most cases, observed concentration levels were near the detection level of the analytical methods applied. However, statistically significant emissions of benzene and several polycyclic aromatic hydrocarbons were observed. Statistically significant emissions of total particulates and PM10 also were found.

#### 93-4 Argonne National Laboratories (ANL) Development of Air Pollution Compliance Strategy Expert Systems

The CTC has completed its portion of the joint project with ANL to develop the conceptual design of an expert system. The objective of the system is a decision-making mechanism that will evaluate the various elements of pollution control and define a facility control strategy. It will provide the user with complete information on technology, regulations, costs, and cross-media impacts.

#### 93-12 "HAP-PRO Version 1.2," EPA-453/B-94-038

This version of HAP-PRO corrected deficiencies in the thermal and catalytic incineration control modules and upgraded these modules to an expert system. Users are now guided through the input process and alerted when their entries are not within nominal design and operational parameters for incineration of organic HAPS and VOC. The thermal and catalytic modules are two of nine

alternative control modules available in the HAP-PRO program. The Carbon Adsorption module had been upgraded previously. Upgrading the six other modules will be the subject of additional CTC projects as time and resources permit.

94-3 "Landfill Air Emissions Model" (Publication/release pending promulgation of Municipal Landfill NSPS)

This project upgraded and improved the CTC's existing "Landfill Air Emissions Model, version 1.1." The new model is consistent with the final new source performance standards for municipal landfills, addresses emissions from both active and closed landfills, and is more user friendly.

94-4 "Used Oil Analysis and Waste Oil Furnace Emissions Study," EPA-456/R-95-001 (Publication/release pending minor editorial changes to text and processing through the CTC's administrative approval procedures.)

This project was a cooperative effort requested by the State of Vermont Agency of Natural Resources, Department of Environmental Conservation. The project analyzed and characterized waste crankcase oil in Vermont; tested emissions from small businesses that burn waste crankcase oil for space heating; assessed potential air and health impacts of combusting waste oil; and evaluated existing Vermont regulations relating to waste oil combustion and Vermont air quality standards based on the results of the study. The CTC, through the Source Characterization and Assessment Group, Emission Monitoring and Analysis Division,

OAQPS, provided for the testing of sources identified by Vermont. Vermont accomplished all other tasks, including overall project management.

94-5 Copper/Manganese Catalyst Evaluation; Letter report to Alan Kilmet, Chief, Air Quality Section, North Carolina Department of Environmental Health and Natural Resources, from Frank Princiotta, Director, Air and Energy Engineering Research Laboratory; April 20, 1994.

This project was requested by the North Carolina Department of Environmental Health and Natural Resources and accomplished in cooperation with the U.S. Air Force. The project evaluated a new catalytic technology that was being considered by the Air Force to treat emissions from surface coating aircraft. North Carolina requested help from the CTC to determine the technical basis of this technology and its ability to meet permit requirements. The results indicated that no catalytic processes were at work and that only small emissions reductions from adsorption may be occurring.

94-6 "Survey of Control Technologies for Low Organic Vapor Gas Streams," EPA-456/R-95-003. (Publication/release pending reformatting of final document and processing through the CTC's administrative approval process.)

This project, requested by STAPPA/ALAPCO, evaluated emerging air pollution control technologies and their ability to treat low organic vapor (VOC and/or organic HAP) concentration, high air

flow emission streams. The study concentrated on identifying and documenting performance and cost of actual industrial applications of new technology.

## APPENDIX C

### CONTROL TECHNOLOGY CENTER

#### REPORTS AND SOFTWARE

##### AIR TOXICS

- 3 ( ) "Evaluation of Potential Emissions of TDI from Two Facilities," EPA-450/3-87-022, PB88-120845
- 5s ( ) "HAP-PRO, version 1.0" EPA-600/8-91-211a, EPA-600/8-91-211b (software); PB92-501212 (manual and software), PB92-135904 (manual only)
- 9 ( ) "Handbook: Control Technologies for Hazardous Air Pollutants" (HAP Manual), EPA-625/6-91-014, PB92-141373 (manual)
- 13 ( ) "Emission Factors for Iron and Steel Sources—Criteria and Toxic Pollutants," EPA-600/2-90-024, PB90-242314
- 24 ( ) "Source Characterization and Control Technology Assessment of MeCl Emissions," EPA-600/2-89-043, PB89-224471
- 36 ( ) "Emission Factors for Iron Foundries—Criteria and Toxic Pollutants," EPA-600/2-90-044, PB90-266743
- 47 ( ) "Benzene Enabling Document," EPA-450/3-90-009, PB91-161737
- 52 ( ) "Determination of Perchloroethylene Content of Waste Materials from Filters and Still Bottoms—Conditional Test Method" (also on EMTIC BBS)
- 53 ( ) "Evaluation of VOC Emissions from Heated Roofing Asphalt," EPA-600/2-91-061, PB92-115286
- 57 ( ) "Carbon Disulfide Emission Control Options," EPA-450/3-91-023, PB93-124667
- 59 ( ) High Risk Point Source Documents—List
- 60 ( ) "Controlling Odorous Emissions from Iron Foundries," EPA-600/R-92-058, PB92-166925
- 67 ( ) "Air Emissions from the Treatment of Soil Contaminated with Petroleum Fuels" EPA-600/R-92-124, PB92-212976
- 94 ( ) "Analysis of Atmospheric Deposition Samples from Easton, PA," EPA-600/R-93-057, PB93-181600
- 95 ( ) "Alternative Control Technology Document - Carbon Reactivation Processes," EPA-453/R-92-019, PB93-180826
- 100 ( ) "Air Emissions and Control Technology for Leather Tanning and Finishing Operations," EPA-453/R-93-025, PB94-120219
- 106 ( ) "Evaluation of Mercury Emissions from Fluorescent Lamp Crushing," EPA-453/R-94-018, PB94-175932
- 113 ( ) "HAP-PRO V.1.2," EPA-453/C-94-038,
- 114 ( ) "Evaluation of Emissions from Paving Asphalts," EPA-600/R-94-135, PB95-129110

- 133 ( ) "HAP-PRO Model User's Manual, Version 2.0,"  
EPA-456/B-94-002, PB95-503181 (software and user  
manual)

#### COMBUSTION

- 4 ( ) "Guidelines for Stack Testing at Municipal Waste  
Combustion Facilities," EPA-600/8-88-085, PB88-234893
- 6 ( ) Chemical and Biological Characterization of Products of  
Incomplete Combustion from the Simulated Field Burning  
of Agricultural Plastic
- 14 ( ) "Characterization of Emissions from the Simulated  
Burning of Scrap Tires," EPA-600/2-89-054, PB90-126004
- 19 ( ) "Operation and Maintenance of Hospital Waste  
Incinerators," EPA-450/3-89-002, PB89-190615
- 20 ( ) "Hospital Incinerator Operator Training Course:  
Volume I: Student Handbook," EPA-450/3-89-003,  
PB89-189872 "Hospital Incinerator Operator Training  
Course: Volume II: Presentation Slides,"  
EPA-450/3-89-004, PB89-189880
- 43 ( ) "Source Book NO<sub>x</sub> Control Technology Data,"  
EPA-600/2-91-029, PB91-217364
- 56 ( ) "Hospital Incinerator Operator Training Course:  
Volume III: Instructors Manual," EPA-450/3-89-010
- 50 ( ) "Radioactive and Mixed Waste Incineration Background  
Information Document, Volume I: Technology,"  
EPA-520/1-91-010-1, PB91-222505; "Radioactive and Mixed  
Waste Incineration Background Information Document,  
Volume II: Risk of Radiation Exposure,"  
EPA-520/1-91-010-2, PB91-222513
- 58 ( ) "Burning Tires for Fuel and Tire Pyrolysis: Air  
Implications," EPA-450/3-91-024, PB92-145358
- 66 ( ) "Characterization of Emissions from the Simulated  
Open-Burning of Non-Metallic Automobile Shredder  
Residue," EPA-600/R-93-004
- 76 ( ) "Mutagenicity of Emissions from the Simulated Open  
Burning of Scrap Rubber Tires," EPA-600/R-92-127,  
PB92-217009
- 78 ( ) "Evaluation Costing of NO<sub>x</sub> Controls for Existing  
Utility Boilers in the NESCAUM Region,"  
EPA-453/R-92-010, PB93-142016
- 102 ( ) "Emissions from Burning Cabinet Making Scraps,"  
EPA-600/R-93-213, PB94-130408
- 105 ( ) "Characterization of Air Emissions from Simulated Open  
Combustion of Fiberglass Materials," EPA-600/R-93-239,  
PB94-136231
- 108 ( ) "Pilot-Scale Evaluation of the Potential for Emissions  
of Hazardous Air Pollutants from Combustion of Tire-  
Derived Fuel," EPA-600/R-94-070, PB94-169463
- 138 ( ) "Used Oil Analysis and Waste Oil Furnace Emissions  
Study," EPA-456/R-95-001

GLOBAL GREENHOUSE GASES TECHNOLOGY TRANSFER CENTER

- 80 ( ) "Development of an Empirical Model of Methane Emissions From Landfills," EPA-600/R-92-037, PB92-152875
- 81 ( ) "Approach for Estimating Global Landfill Methane Emissions," EPA-600/7-91-002, PB91-149534
- 82 ( ) "Landfill Gas Energy Utilization: Technology Options and Case Studies," EPA-600/R-92-116, PB92-203116
- 83 ( ) "Analysis of Factors Affecting Methane Gas Recovery From Six Landfills," EPA-600/2-91-055, PB92-101351
- 84 ( ) "List of Papers and Reports for EPA's Research Program on Air Emissions from Landfills and Other Waste Management Processes"
- 85 ( ) "A Comparison of Methods for Estimating Global Methane Emissions from Landfills," 1993, EPA-600/J-93-250, PB93-212561
- 86 ( ) "Landfill Gas Recovery/Utilization - Options and Economics," 1992, EPA-600/A-92-170, PB92-217066
- 87 ( ) "Landfill Gas Utilization - Options, Benefits, and Barriers," 1992, EPA-600/A-92-129, PB92-195916
- 88 ( ) "Emissions and Mitigation at Landfills and Other Waste Management Facilities"
- 120 ( ) "The Coprocessing of Fossil Fuels and Biomass for CO<sub>2</sub> Emission Reduction in the Transportation Sector," 1993, EPA-600/A-93-109, PB93-194165
- 121 ( ) "Methane Emissions from Industrial Sources," 1993, EPA-600/A-94-089, PB94-174760
- 123 ( ) "Landfill Gas Utilization - Technical and Non-Technical Considerations," March 1994, EPA-600/A-94-139, PB94-189651
- 124 ( ) "Estimate of Methane Emissions from Coal Mines," 1993, EPA-600/J-93-249, PB93-212553
- 125 ( ) "Landfill Gas and Its Influence on Global Climate Change," October 1993, EPA-600/A-93-240, PB94-113784
- 126 ( ) "Methane Emissions from Landfills and Open Dumps," EPA-230/R-93-010
- 127 ( ) "Methane Emissions from Wastewater Treatment and Disposal," EPA-230/R-93-010
- 128 ( ) "Biomass Gasification Pilot Plant Study; Final Report," EPA-600/R-93-170, PB94-114766
- 129 ( ) "Demonstration of Fuel Cells to Recover Energy from Landfill Gas Phase I Final Report: Conceptual Study," EPA-600/R-92-007, PB92-137520
- 130 ( ) "Proceedings: The 1992 Greenhouse Gas Emissions and Mitigation Research Symposium," EPA-600/R-94-008, PB94-132180
- 131 ( ) "Estimate of Methane Emissions from U.S. Landfills," EPA-600/R-94-166, PB94-213519
- 132 ( ) "Estimate of Methane Emissions from U.S. Natural Gas Operations," March 1994
- 135 ( ) "Landfill Gas Utilization - Database of North American Projects," EPA-600/A-94-064, PB94-162773
- 136 ( ) "Technological Considerations for Planning the Global Carbon Future," EPA-600/A-93-182, PB93-222008

## RACT/BACT/LAER CLEARINGHOUSE

- 79 ( ) "RACT/BACT/LAER: A Compilation of Control Technology Determinations, Second Supplement to 1990 Edition," EPA 453/R-92-002, PB92-235647
- 89 ( ) "RACT/BACT/LAER Clearinghouse Information System (BLIS) User's Manual, EPA-453/B-92-012, PB93-122422
- 103 ( ) "RACT/BACT/LAER Clearinghouse Information System (BLIS) User's Manual, EPA-453/B-93-049, PB94-114402
- 104 ( ) "RACT/BACT/LAER: A Compilation of Control Technology Determinations, "Volume 1-Third Supplement to the 1990 Edition", EPA 453/R-93-037a, PB94-111234  
"RACT/BACT/LAER: A Compilation of Control Technology Determinations, "Volume 2-Third Supplement to the 1990 Edition", EPA 453/R-93-037b, PB94-111572
- 115 ( ) "RACT/BACT/LAER: A Compilation of Control Technology Determinations, Fourth Supplement to the 1990 Edition," EPA-453/R-94-055, PB94-206729
- 116 ( ) RACT/BACT/LAER Clearinghouse Information System (BLIS) User's Manual, EPA-453/B-94-072, PB95-166856
- 117 ( ) RACT/BACT/LAER Clearinghouse Flyer

## VOC - OTHER SOURCE CATEGORIES

- 11 ( ) "Assessment of VOC Emissions from Fiberglass Boat Manufacturing," EPA-600/2-90-019, PB90-216532
- 35 ( ) "Soil Vapor Extraction-VOC Control Technology Assessment," EPA-450/4-89-017, PB90-216995
- 39 ( ) "Control of VOC Emissions from Polystyrene Foam Manufacturing," EPA-450/3-90-020, PB91-102111
- 41s ( ) "Landfill Air Emissions Estimation Model," EPA-600/8-90-085a, PB91-167718, manual;  
EPA-600/8-90-085b, PB91-507541, software and manual
- 45 ( ) "Enabling Document for NSPS for Oxidation Process and Distillation Operations in SOCM," EPA-450/3-90-018, PB92-161967
- 46 ( ) "Polymer Manufacturing Industry Enabling Document," EPA-450/3-90-019, PB91-161745
- 61 ( ) "Assessment of VOC Emissions and Their Control from Bakers Yeast Manufacturing Facilities, EPA-450/3-91-027, PB92-145408
- 65 ( ) "The Measurement Solution: Using a Temporary Total Enclosure for Capture Efficiency Testing," EPA-450/4-91-020a, PB92-190271
- 68 ( ) "Identification and Characterization of Missing or Unaccounted for Area Source Categories," EPA-600-R-92-006, PB92-139377
- 70 ( ) "Control of VOC Emissions from Ink and Paint Manufacturing Processes," EPA-450/3-92-013, PB92-190230
- 77 ( ) "Control of VOC Emissions from Nonferrous Metal Rolling Processes," EPA-453/R-92-001, PB92-227677
- 93 ( ) "Alternative Control Technology Document for Bakery

- Oven Emissions," EPA-453/R-92-017, PB93-157618
- 101 ( ) "Intitial Assessment of Emissions from Heat Setting Carpet Yarn," EPA-600/R-93-161, PB93-229862
- 109 ( ) Beyond RACT - DRAFT Report
- 134 ( ) "Survey of Control Technologies for Low Concentration Organic Vapor Gas Streams," EPA-456/R-95-003

#### VOC - SURFACE COATING/GRAPHIC ARTS

- 15 ( ) "Ultrasonic Cleaning of Rotogravure Cylinders," EPA-450/3-89-024, PB89-216360
- 16 ( ) "Reduction of Volatile Organic Emissions from Automobile Refinishing," EPA-450/3-88-009, PB89-148282
- 18 ( ) "Reduction of Volatile Organic Compound Emissions from Traffic Markings," EPA-450/3-88-007, PB89-148274
- 25 ( ) "Evaluation of Emission Controls at Leeds Architectural Products" (Spray Booth Controls), EPA-450/3-89-001, PB90-120106
- 30 ( ) "Powder Coating Technology Update," EPA-450/3-89-033, PB90-127341
- 38 ( ) "Radiation Curable Coatings," EPA-600/2-91-035, PB91-219550
- 40 ( ) "Best Demonstrated Control Technology for Graphic Arts," EPA-450/3-91-008, PB91-168427
- 75 ( ) "Alternate VOC Control Technique Options for Small Rotogravure and Flexography Facilities" EPA-600/R-92-201, PB93-122307
- 96 ( ) "Automobile Assembly Plant Spray Booth Cleaning Emission Reduction Technology Review," EPA-453/R-94-029, PB94-206257
- 110 ( ) Lithographic Printing ACT
- 111 ( ) DRAFT Model Rule for Wood Furniture

#### WASTEWATER/GROUNDWATER TREATMENT

- 1 ( ) "Air Stripping of Contaminated Water Sources-Air Emissions and Controls," EPA-450/3-87-017, PB88-106166
- 12s ( ) "Surface Impoundment Modeling Systems (SIMS) Version 2.0 Users' Manual," EPA-450/4-90-019a, PB91-156711 and "Background Document for Surface Impoundment Modeling System (SIMS) Version 2.0," EPA-450/4-90-019b, PB91-156729 PB91-506911 (Manual), PB 91-506998 (software, Manual and Background),
- 26 ( ) "ASPEN Expert System for Steam Stripping Calculations: Users' Manual," EPA-450/3-90-003
- 28 ( ) "Control Technology Assessment for Air Emissions from Wastewater Treatment," EPA-450/3-89-008, PB89-207922
- 31 ( ) "Industrial Wastewater VOC Emissions-Background for BACT/LAER," EPA-450/3-90-004, PB90-194754
- 32 ( ) "Comparisons of Air Stripper Simulations and Field Performance Data," EPA/450/1-90-002, PB90-207317
- 33 ( ) "Air Stripper Design Manual, Air/Superfund National

Technical Guidance," EPA-450/1-90-003, PB91-125997

WOOD PRODUCTS

- 2 ( ) "Evaluation of Emission Sources at a Waferboard Manufacturing Plant," EPA-450/3-87-021, PB88-107735
- 8 ( ) "Evaluation of Emission Factors for Formaldehyde from Certain Wood Processing Operations," EPA-450/3-87-023, PB88-118492
- 22 ( ) "Evaluation of Emission Sources from Creosote Wood Treatment Operations," EPA-450/3-89-028, PB89-224729
- 27 ( ) "Evaluation of Emission Control Devices at Waferboard Plants," EPA-450/3-90-002, PB90-131442
- 51 ( ) "Evaluation of Air Toxic Emissions at Minnesota's Reconstituted Panelboard Plants," EPA-450/3-91-009

MISCELLANEOUS

- 29 ( ) "Affordability Analysis of Lead Emission Controls for a Smelter-Refinery," EPA/450-3-90-001, PB90-120122
- 37 ( ) "Test Report: Method Development & Evaluation of Draft Protocol for Measurement of Condensibles," EPA-450/4-90-012, PB90-240805
- 42 ( ) "Assessment of the Controllability of Condensable Emissions," EPA-600/8-90-075, PB91-125807
- 55 ( ) Control Technology Center Program Operating Manual
- 63 ( ) "OAQPS Cost Control Manual," EPA-450/3-90-006, PB90-169954
- 64 ( ) "OAQPS Cost Control Manual-Supplement," EPA-450/3-90-006a, PB92-137181
- 69 ( ) "Managing Chemicals Safely, Putting It All Together," EPA-510-K-92-001
- 71 ( ) "The Clean Air Act of 1990: A Guide for Small Businesses," EPA 450/K-92-001
- 74 ( ) "Electrostatic Precipitator V-I and Performance Model: User's Manual," EPA-600/R-92-104a, PB92-169614
- 90 ( ) "OAQPS Cost Control Manual-Supplement 2," EPA/450/3-90-006b, PB93-138147
- 92 ( ) "A Guidebook for Explaining Environmental Regulations to Small Businesses," EPA 453/B-93-023, PB94-120334
- 97 ( ) SAGE 2.0, "Solvent Alternative Guide, User's Guide," EPA-600/R-94-069, PB94-501764
- 98 ( ) CTC NEWS - most recent issue
- 99 ( ) "Evaluation of the Polyad® With FB Air Purification & Solvent Recovery Process for Styrene Removal," EPA-600/R-93-212, PB94-130317
- 107 ( ) "OAQPS Cost Manual-Supplement 3, Hoods, Duct Work, Stacks," EPA-450/3-90-006c, PB94-177565
- 112 ( ) "Oil Suppression of Particulate Matter at Grain Elevators," EPA-453/R-94-049

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15. SUPPLEMENTARY NOTES <b>The APPCD CTC Co-Chair is Charles H. Darwin, MD-91, (919) 541-7633.</b>		
16. ABSTRACT <b>The report summarizes the fiscal year activities and accomplishments of the EPA's Control Technology Center (CTC), located in Research Triangle Park, NC, and sponsored by EPA Air Pollution Prevention &amp; Control Division and Office of Air Quality Planning and Standards. CTC services were accessed 35,000 times during the year. This includes HOTLINE calls, access to computer bulletin boards and data bases, and requests for CTC products. Overall use of CTC services increased 14% over FY93. The report discusses program activities and outreach efforts during FY94 to provide service to the CTC's growing client list. It also examines strategies to maintain the CTC's continued success in providing technical assistance in air pollution prevention and control to both government air pollution control agencies and the private sector.</b>		
17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
<b>Pollution, Information Centers, Data, Technical Reports, Computer Programs</b>	<b>Air Pollution Prevention, Air Pollution Control, Stationary Sources, Technical Assistance Data Bases, Electronic Bulletin Boards</b>	<b>13B, 05B, 14G, 09B</b>
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