

# EPA Control Technology Center NEWS

Volume 8 No. 3

A JOINT EPA / STAPPA / ALAPCO PROJECT

September 1996

## CTC NEWS SPECIAL EDITION

by Bob Blaszcak,  
CTC/OAQPS Co-Chair

Now that we're back in print, we'd like to fill you in on what you missed during the year between printed editions. This SPECIAL EDITION includes articles or updates to articles that appeared in the electronic versions of the CTC NEWS released during this one year hiatus. Also, you'll find updates from the Clearinghouse for Inventories and Emission Factors (CHIEF), information on the new Industrial Combustion Coordinated Rulemaking (ICCR) process, and a CTC product ordering form. Enjoy! See you in the regular fall edition of the CTC NEWS in November.



## CO\$T-AIR CONTROL COST SPREADSHEETS:

### *Novocaine for Number Crunchers*

By Bill Vatavuk  
ISEG/AQSSD/OAQPS

Anyone familiar with the *OAQPS Control Cost Manual (Manual)* knows that air pollution control costs depend upon a variety of emission stream, control device, and financial parameters. Often this dependency is quite complex.<sup>1</sup> For that reason, it is cumbersome and time-consuming—if not downright *painful*—to make these sizing and costing calculations by hand, especially if costs are needed for a range of input parameters (e.g., waste gas flowrate).

To enable the thousands of *Manual*

users to make these calculations more efficiently, we developed 20 spreadsheet programs, collectively named "CO\$T-AIR," to cover twelve control devices and one category of auxiliary equipment (ductwork). Because the spreadsheets allow for the escalation of equipment costs, they bridge the gap between the *Manual* and the *VAPCCI* (Vatavuk Air Pollution Control Cost Indexes), the latter being documented in a recent EPA report.<sup>2</sup> The CO\$T-AIR programs are written in Lotus 1-2-3® (version 2.0). Each program outputs itemized total capital investment and total annual costs for a given set of input parameters. The devices and auxiliary equipment for which we wrote spreadsheets are listed in the table (See page 2), alongside the Lotus® file names and the *Manual* chapters that correspond to them.

In each of these file names, "TCI" denotes "total capital investment," while "WK1" is simply the Lotus® version 2.0 file extension. Those file names containing "2" are second versions of the spreadsheets in question. The character "-L" signifies that the spreadsheet is for "large" units—i.e., those devices whose sizes exceed the upper limits of the cost correlations. As the list indicates, we wrote "large" spreadsheets for thermal and catalytic incinerators, regenerative thermal oxidizers, flares, mechanical collectors, and wet impingement scrubbers.

Finally, for the refrigeration systems, "-C" and "-P" denote the spreadsheets for "custom" and "packaged" units, respectively.

Most of the programs were based on design and cost data and procedures

in the *OAQPS Control Cost Manual* (Fourth Edition, 1990) and its supplements. The exceptions were the programs for mechanical collectors, venturi scrubbers, and wet impingement scrubbers.

Spreadsheets for these three devices were based on information in the book *Estimating Costs of Air Pollution Control (ECAPC)*.<sup>5</sup>

### Spreadsheet Components

Although there are significant differences

among the various spreadsheets, some components are common to all. First, each spreadsheet consists of six sections: (1) "Cost Base Date"/"VAPCCI," (2) "Input Parameters," (3) "Design Parameters," (4) "Capital Costs," (5) "Annual Cost Inputs," and (6) "Annual Costs". In the first section, the "Cost Base Date" is the date corresponding to the equipment costs ("base costs") in the *Manual* or *ECAPC*. This date ranges from third quarter 1986 (fabric filters) to second quarter 1993 (ductwork).

Next, the "VAPCCI" is used by the spreadsheet to escalate the equipment costs from the base date to the quarter and year selected by the user.<sup>6</sup> Eleven VAPCCI have been developed, one for each of the control devices listed above.<sup>7</sup> (The sole exceptions are the "venturi scrubbers" and "wet impingement scrubbers" categories, which have been combined into one index: "wet scrubbers".) Each spreadsheet is written so that once the user inputs the latest VAPCCI available, the total capital investment cost and capital cost-dependent annual costs will automatically be escalated.

The second section, "Input Param-  
(continued page 2)



## CO\$T-AIR

(continued from page 1)

eters," contains technical data that, in nearly all cases, *must be entered by the user*. Because these input parameters vary so much according to control device designs and applications, there are no "default" values for them. Input parameters include standard stream parameters (e.g., waste gas volumetric flowrate) and data specific to a device (e.g., gas absorber packing parameters). The spreadsheet needs these data to compute the design parameters, the costs, or both.

The "Design Parameters" section lists data (such as ESP collecting area) that are primarily calculated by the spreadsheet based on the input parameters. The "Capital Costs" section displays the control device total equipment cost (itemized), the purchased equipment cost, and the total capital investment (TCI). Two values are given for the total equipment cost. The first corresponds to the base date of the costs (e.g., second quarter 1987); the second, to the VAPCCI escalation date.

The fifth section, "Annual Cost Inputs," lists nearly all of the parameters needed for the program to calculate the various annual costs. These include the "operating factor" (the hours per year the control device operates), operating and maintenance labor rates, utility prices, the interest rate, and the control system life. As with the "Input Parameters" section, *the user must provide all of these inputs*. Nevertheless, typical values for the parameters are given in the *Manual* chapter covering the device in question.

Given in dollars/year, the "Annual Costs" are listed in the last section of the program. These are itemized according to: (1) *direct annual costs* (operating, maintenance, and supervisory labor; maintenance materials; utilities; operating materials (e.g., caustic soda); replacement parts; and waste treatment/disposal), (2) *indirect annual costs* (overhead; capital recovery; and taxes, insurance, and administrative charges), and (3) *recovery credits* (if any).

**TABLE. CO\$T-AIR SPREADSHEET PROGRAMS**

Classification	Control Device Type	Manual Chapter	Lotus® File Name(s)
Particulate emission controls	Electrostatic precipitators	6	TCI-EP2.WK1
	Fabric filters	5	TCI-FF2.WK1
	Mechanical collectors (cyclones)	None <sup>4</sup>	TCI-MC.WK1 TCI-MC-L.WK1
	Venturi scrubbers	None <sup>4</sup>	TCI-VS2.WK1
	Wet impingement scrubbers	None <sup>4</sup>	TCI-WIS.WK1 TCI-WI-L.WK1
Gaseous emission controls	Carbon adsorbers	4	TCI-CA.WK1
	Catalytic incinerators	3	TCI-CI.WK1 TCI-CI-L.WK1
	Gas absorbers	9	TCI-GA.WK1
	Flares	7	TCI-FL.WK1 TCI-FL-L.WK1
	Refrigeration systems	8	TCI-RS-C.WK1 TCI-RS-P.WK1
	Regenerative thermal oxidizers	3	TCI-RTO.WK1 TCI-RT-L.WK1
	Thermal incinerators (recuperative)	3	TCI-TI.WK1 TCI-TI-L.WK1
	Auxiliary equipment	10	TCI-CTX.WK1

### Obtaining the Spreadsheets

The CO\$T-AIR spreadsheets are installed on the OAQPS TTN, where there are posted on both the Control Technology Center (CTC) and the Clean Air Act Amendments (CAAA) bulletin board systems. Because the

spreadsheets are written in Lotus® (version 2.0), they are in a format that is importable to later versions of Lotus®, as well as to such programs as Excel® and Quatro-Pro®. Accompanying the spreadsheets is an *Introduction* (in WordPerfect 5.1), which provides background on the programs, describing their general and specific features. Those with questions or com-

ments about CO\$T-AIR should contact **William M. Vatavuk, at (919)-541-5309 (fax: 919/541-0839)**. Readers desiring copies of the *OAQPS Control Cost Manual* should phone the **Control Technology Center at (919)541-0800**.

### FOOTNOTES

<sup>1</sup> Consider, for instance, the sizing and costing procedures for gas absorbers, presented in Chapter 9 of the *Manual*.

<sup>2</sup> *Escalation Indexes for Air Pollution Control Costs* (EPA-452/R-95-006, October 1995). Both the report and quarterly VAPCCI updates are posted on the OAQPS Technology Transfer Network ("Clean Air Act Amendments" and "Control Technology Center" bulletin boards).

<sup>3</sup> All programs are written in Lotus 1-2-3® (version 2.0).

<sup>4</sup> Design and cost procedures and data for these devices may be found in the book *Estimating Costs of Air Pollution Control*, by William M. Vatavuk (Boca Raton, FL: CRC Press/Lewis Publishers, 1990).

<sup>5</sup> Vatavuk, William M., *Estimating Costs of Air Pollution Control*. Boca Raton, FL: CRC Press/Lewis Publishers, 1990.

<sup>6</sup> As of this writing, the VAPCCI have been updated through first quarter 1996 (preliminary).

<sup>7</sup> The ductwork costs are escalated via a Producer Price Index published by the Bureau of Labor Statistics, Department of Labor.

## CHIEF NEWSLETTER GOES ELECTRONIC

by Mary Anne Barckhoff  
Lockheed Martin

In the interest of reducing paper waste and cost, the US EPA Emission Factor and Inventory Group's (EFIG) *CHIEF Newsletter*, once a printed quarterly newsletter, has now gone completely electronic! The *CHIEF Newsletter* is a primary source for current information about new developments in EPA's emission estimation tools, emission inventory projects, and guidance documents on emission estimation and inventories. It also has features on emission inventory conferences, EPA/state partnership programs, international workshops, and other current events. Two *CHIEF* articles that may be of interest to *CTC Newsletter* readers are reprinted below.

Though it is no longer available in print, the *CHIEF Newsletter* is available in a variety of electronic formats, including a list server that will send the newsletter articles to your e-mail address. The latest issue is the Summer 1996 edition. Here's how to obtain a copy:

1. *Fax CHIEF*: Call (919) 541-5626 or (919) 541-0548 from your fax machine and follow the voice instructions. The code number for the Summer 1996 edition is 003242.

2. The OAQPS TTN *CHIEF* Bulletin Board (BBS): Modem access (919) 541-5742. The newsletters are stored under the NEWS menu item in both ASCII text format and *Adobe Acrobat* format, which requires downloading of the *Adobe Acrobat* Reader

## INDUSTRIAL COMBUSTION COORDINATED RULEMAKING (ICCR)

by Amanda Agnew, ESD/OAQPS

The Combustion Group in the Office of Air Quality Planning and Standards is taking an alternative approach

(a run-time view program also available on the BBS and the Internet). The *CHIEF* BBS is also available on the World Wide Web at

<http://ttnwww.rtpnc.epa.gov>.

3. The World Wide Web:

Browse <http://www.epa.gov/oar/oaqps/efig/chiefnl.html> to find the *CHIEF Newsletter* in *Adobe Acrobat* format.

4. E-mail: To subscribe to the *CHIEF* list server send E-mail to [listserv@unixmail.rtpnc.epa.gov](mailto:listserv@unixmail.rtpnc.epa.gov). In your message type subscribe **CHIEF** <First name> <Last name>. You will receive articles from the newsletter as well as announcements relevant to the functions of EPA's Emission Factor and Inventory Group.

If you have further questions about EFIG products or projects, call *Info CHIEF*, (919) 541-5285.

### AP-42 Supplement B Sections Available!

The Emission Factor and Inventory Group (EFIG) now has *Compilation of Air Pollutant Emission Factors* (AP-42) Supplement B sections available on the *CHIEF* BBS and *Fax CHIEF*. New, complete Supplement B sections that are currently available include: 9.7—Cotton Ginning; 11.7—Ceramic Clay Manufacturing; and 12.20—Electroplating. Sections 9.12.1—Malt Beverages and 11.23—Taconite Ore Manufacturing are expected to be available in August. These sections can be found under the "Supplement A & B to 5th Edition" menu item under the "AP-42" menu item on the *CHIEF* BBS. Also look for a new draft section on Wood Preserving under the "Draft Sections Under Review" menu item. If you have questions, call *Info CHIEF*, (919) 541-5285.

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for the regulating of industrial-commercial-institutional (ICI) combustion sources. Because ICI facility operators have several options available for generation of thermal energy and combustion of fuels and non-hazardous waste streams, an integrated approach for examining and regulating ICI combustion activities seems more feasible. This process is called (ICCR). The overall goal of the ICCR is to develop a unified set of Federal air emissions

## EFIG PROJECTS ON THE HORIZON

by Roy Huntley  
EFIG/EMAD

The EFIG staff is continually revising and updating the *Compilation of Air Pollutant Emission Factors* (AP-42) and the *Locating and Estimating* (L&E) document series on air toxics. Below are some brief descriptions of projects that are currently funded. We always welcome comments about the value of our efforts, and we especially welcome data. Call *Info CHIEF*, (919) 541-5285 for questions or comments.

Projects currently underway:

- Abrasive Blasting
- Alumina
- Arsenic L&E document
- Bread Baking
- Brick & Related Clay Products
- Coke Production
- Distilled Liquors
- FIRE Update
- Grain Elevators
- Hot Mix Asphalt
- Lead L&E document
- Municipal Solid Waste Landfills
- Organic Liquid Storage (TANKS)
- Paved Roads
- Surface Coal Mining
- Unpaved Roads

New Starts:

- Mercury L&E document
- Update Internal Combustion Engines
- Update Natural Gas Combustion
- Update Boiler NOx (emission factors from the Acid Rain Program)
- Steel Manufacturing

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regulations through a highly participatory and coordinated process that will result in reducing toxic and criteria air pollutant emissions. Also, it is anticipated that a coordinated process will result in more consistent regulations with greater environmental benefits at a lower cost than piecemeal regulations.

### REGULATORY BACKGROUND

Five categories of ICI combustion  
(continued page 8)

# SMALL BUSINESS UPDATE

Deborah M. Elmore, Federal SBAP Coordinator, CTC/OAQPS

## SBAP FORUM

Welcome to the SBAP Forum. For each issue, we will invite one or more of our State or local Small Business Assistance Programs to discuss successful and innovative activities that may be of interest to their colleagues across the country.

### MASSACHUSETTS PRINTERS PARTNERSHIP PROGRAM (MP<sup>2</sup>)

by George Frantz,  
Office of Technical Assistance/SBAP

The Massachusetts Printers Partnership (MP<sup>2</sup>) is a joint project involving:

- Printers, consultants and vendors to the printing industry
- Printing Industries of New England (PINE)
- Massachusetts Department of Environmental Protection (DEP)
- OTA's Small Business Assistance Program (OTA/SBAP)
- EPA - New England Environmental Assistance Team (NEEAT)
- Screen and Graphic Imaging Association.

The pilot program began last spring with a series of meetings involving printers and agency personnel, at which the group identified both environmental concerns in the printing industry and a set of environmental criteria which would indicate that best environmental management practices were being followed.

MP<sup>2</sup> allows printers to come into compliance with the new protocols simply, inexpensively and in multi-media fashion. It imposes some additional requirements, both in photo wastewater discharge and in air emissions, which will assure industry-wide emissions reductions based on pollution prevention (P2). Program elements follow:

*Aggressive outreach*, including the development of a "plain language workbook" or printers, which will detail compliance requirements to which printers are

subject and closely coordinated program materials which will lead the individual printing plant manager in a step-by-step self-certification process. OTA is hosting a series of six half-day workshops and clinics at convenient sites across the state, jointly funded by DEP, EPA-New England and OTA.

*Regulatory Reform*, the Partnership enrollment, will replace virtually all environmental permits typically required of small and midsize printers and a six month enforcement moratorium to allow Partnership members to come into compliance.

*Pre and post-program sampling* to determine level of improved environmental performance, according to established measures of success and a carefully selected statistical sample. EPA has placed a high priority on demonstration projects which validate the concept of improving environmental performance by creating incentives for voluntary compliance. There was resistance to the concept of beginning a cooperative program with inspections, but this was deemed essential to establish a baseline. Fifty inspections were agreed upon and conducted under enforcement discretion, there would be no penalty except in extreme situations.

*Strong public relations efforts*, involving key state officials and representatives of the printing industry, working with statewide media to tout the program and encourage consumers to patronize printers who display the MP<sup>2</sup> logo.

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### SUCCESS STORY!

John A. Bernardo, Coordinator  
BAP, Tucson, AZ

A wrecking yard was cited for 23 violations (NOVs) of several environmental codes during an inspection. Two days later, staff from the department's Business Assistance Program (BAP) spent four hours discussing the individual violations and suggesting methods for returning to compliance with the business owner. A compliance plan was developed by the owner, inspector, and assistance staff.

During these discussions, the owner confided to assistance staff that since receiving the NOVs, he had been swamped with phone calls from other wrecking yard owners asking what happened, Would his business be shut down, and what about their business? It seemed many of the violations proved to be standard operating procedure for wrecking yards.

Upon learning about the widespread concern, BAP staff planned a half-day seminar for wrecking yard and auto shop owners concerning applicable environmental regulations and waste minimization techniques. The owner cited for the 23 NOVs actively participated in the development of the seminar and served as a principal speaker. Though his voice was a bit shaky, he was able to relate his experiences with the Agency, including the assistance provided, and furthered the rapport between the department and the regulated community in ways no government representative could ever hope to achieve.

Small Business assistance staff would do well to look for ways of not only encouraging environmental compliance for the individual offender, but maximizing efforts by providing assistance to all members.

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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## **\$1.5 MILLION IN SMALL BUSINESS ASSISTANCE GRANTS TO 15 STATES**

by Deborah Elmore  
FSBAP/OAQPS

In late September, the Federal SBAP announced grant awards totaling \$1.5 million for 10 model small business assistance projects in 15 states. These grants will be implemented by state Small Business Assistance Programs; states will use these grants to address air pollution issues as well as water, waste, and other environmental concerns. The funds will be utilized to demonstrate effective ways of providing regulatory assistance to small businesses. The program will emphasize (1) pollution prevention as an alternative to traditional governmental "command and control" techniques; and (2) integration with existing small business assistance providers, such as state pollution prevention programs, and university run Small Business Development Centers (SBDCs) supported by the U.S. Small Business Administration (SBA). These grants are funded through a section of President Clinton's Environmental Technology Initiative (ETI) which focuses on pollution prevention as a means for reducing barriers to pollution control innovation by small businesses. ETI was launched by President Clinton in 1993 to spur the development and use of innovative methods to protect the environment and enhance the competitiveness of the U.S. environmental technology industry. The states selected for grants are Connecticut, Virginia, Florida, Minnesota, Arkansas, Kansas, Utah, and Nevada, along with two multi-state efforts (Texas/New Mexico/Oklahoma, and Washington/Oregon/Alaska/Idaho). Each state and multi-state project will get \$150 thousand to be spent within three years. EPA asked all states in the country to apply for the grants, and the Agency picked the submittals containing the most innovative methods of assisting small business. States are required to match federal

funds by at least 20 percent, either in dollars or resources. For further information, contact Deborah Elmore at 919-541-5437.

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## **NEW LANDFILL AIR EMISSIONS MODEL**

by Bob Blaszczyk  
CTC/OAQPS

The Landfill Air Emission Model is available on the CTC BBS and HOME PAGE. It provides an automated estimation tool for quantifying emissions from municipal waste landfills. The model estimates emissions of methane, carbon dioxide, nonmethane organic compounds, and toxic air pollutants. Information on the assumptions used in the model can be found in the background information document (NTIS # PB91-197061) written to support the Municipal Landfill New Stationary Performance Standards (NSPS), 40CFR60 Subpart WWW, and Guidelines for Control of Existing Sources, 40CFR60 Subpart Cc, and in the public docket, Docket A-88-09. This article contains information on the beta release versions of the Landfill Air Emissions Estimation Model for DOS (Version 2.0) and Microsoft# Windows (Version 1.0).

The Landfill Air Emissions Model is regarded as a screening tool to determine which landfill sites may require control for the Clean Air Act regulations promulgated in March 1996. The model can be used with site specific data, or it can be used with default values which reflect the expected maximum emissions. The rule uses a tiered approach. The first tier relies on defaults and later tiers use field test data to help better characterize landfill emissions.

The model can also be used for estimating typical landfill emissions and is suggested for use in developing estimates for state inventories. A second set of defaults is provided (the AP-42 defaults). The AP-42 default values are based on emission factors from the EPA's Compilation of Air Pollutant Emission Factors, Fifth Edition, AP-42

(EP1995). As of this writing, the AP-42 values have been revised and are available for public comment. The beta version of this software includes the revised AP-42 suggested defaults. Once the AP-42 revisions are published as final, the defaults in these models will be revised to reflect any changes. This is anticipated for later this year. Until the values are considered final, the model will be referred to as a beta version.

An IBM-compatible personal computer with at least one floppy disk drive and 4 megabytes of memory is recommended for this program. The Windows version requires Windows 3.1 or better. The DOS version requires DOS 2.0 or better. All software components of the models for this beta release are fully functional.

The CTC BBS and HOME PAGE have versions of the Landfill Air Emissions Estimation Model for DOS and Windows. Each model is provided in a separate self-expanding ZIP file (LAND\_DOS.EXE for the DOS version and LAND\_WIN.EXE for the Windows version). Just download the appropriate version and put it in its own directory. To extract the files, either double-click

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### **Control Technology Center NEWS**

The CTC NEWS is a quarterly publication of the U.S. EPA's Control Technology Center (CTC). The CTC is an informal, easy-to-use, no cost, technical assistance service for all State and local (S/L) air pollution control agency's and EPA Regional Office staffs. For others, some services may be on a cost reimbursable basis. The CTC offers quick access to EPA experts and expertise via the CTC HOTLINE and the CTC Bulletin Board, and in-depth technical support through source specific Engineering Assistance Projects or more generic Technical Guidance Projects. The CTC is operated by the Air Pollution Prevention and Control Division, National Risk Management Research Laboratory and the Information Transfer and Program Integration Division, Office of Air Quality Planning and Standards in Research Triangle Park, North Carolina.

If you have any air pollution emission or control questions, or would like more information about the CTC and the types of technical assistance available, CALL THE CTC HOTLINE!

**(919) 541-0800**

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## **RBLC ADDS MORE NEW FEATURES**

by Jo Ann Kerrick  
VIGYAN

The RACT/BACT/LAER Clearinghouse (RBLC) continues to make improvements to help you work more efficiently. Look for the features described below on the TTN now. We think you'll like what you see.

### Comprehensive Search for Pollutants

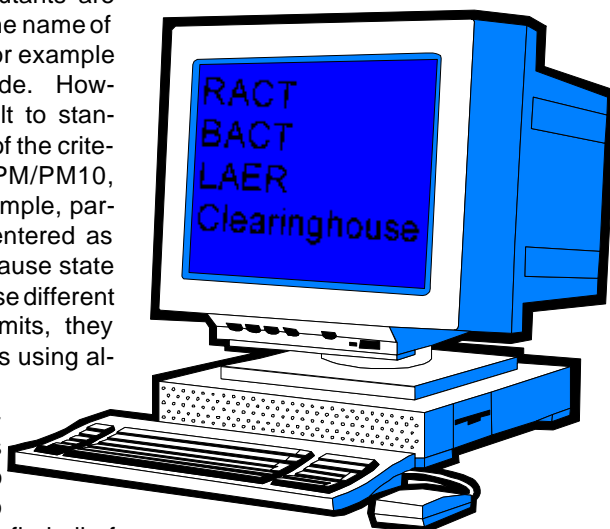
The Query module of the RBLC information system is frequently used to search any of the RBLC data bases for specific pollutants. Pollutants are most often entered with the name of their chemical formula, for example "CO" for carbon monoxide. However, it has been difficult to standardize names for some of the criteria pollutants: NO<sub>x</sub>, PM/PM<sub>10</sub>, SO<sub>x</sub>, and VOC. For example, particulate matter may be entered as PM, PM<sub>10</sub>, or TSP. Because state and local agencies may use different terminology in their permits, they enter their determinations using alternative names for some pollutants. While this flexibility on naming allows users to tailor the RBLC to their own permits, it also makes it more difficult to find all of the data base entries for a particular pollutant.

The RBLC now has an option to insure that you find all information related to a particular criteria pollutant. The Query module detects when you are trying to search for a criteria pollutant and asks whether you want to perform a comprehensive search. If you do, the system searches for all appropriate variations of the pollutant name. This comprehensive search looks for the pollutant name you specified plus any alternative names. Otherwise, you can choose to search just for the name you entered. The search prompt appears whenever you search for a pollutant name that equals one of these four criteria pollutants. The comprehensive

search for pollutants is available with either the standard or advanced search options.

### Changes in the RBLC Data Fields

All of the data screens in the RBLC have been revised to reflect changes made to the data base structure at the facility, process, and pollutant levels. At the facility level, the number of dates tracked by the system has been reduced from 10 to 4. Infrequently used dates have been removed, and the four remaining dates each use a three-character flag to indicate whether the date is an estimate or an actual date. Removing the extraneous dates simplified the facility data screen and also freed up enough space to display the initial por-



tion of the facility notes on the same screen as the other facility data. At the process level, three new fields have been added for notes specific to the process or to compliance verification. In addition, the boiler size field has been deleted, and a field for primary fuel added. The changes at the pollutant level may not be immediately visible because the screen looks essentially the same. However, if you've ever tried to enter cost information, you'll notice the difference. The cost fields no longer include a decimal point, so the system now has room to store larger cost values. The problems several users have had entering large capital costs should be resolved with this change.

While we were working on all the RBLC modules, we made several miscellaneous updates. First, BLIS has been replaced with RBLC. Secondly, we changed the warning screens to appear in red so that they are more visible to users. Last but not least, determinations are listed in order of RBLC ID in the view list in the Query module. Previously, facilities were listed in the order that they were added to the data base, which meant that all entries for one state did not necessarily appear together.

### BROWSE Module Added for RBLC Data Base

A new "Browse" option, available from the RBLC main menu, lets you select from a list of process types and search the data base for all determinations of that type. You can even search for a major category of process type to view the complete set of determinations in all of the subcategories for that process category. For example, searching for process type 11.000 will find all external combustion processes from 11.001 to 11.999. In Browse, the view list is sorted by facility name so that you can readily find determinations of interest to you. A "Jump" option lets you move quickly to the facility name that begins with a given letter.

In addition to viewing the facilities on-line, you can mark selected facilities and download them to your local PC. A "Mark" option at the facility list lets you mark or unmark all of the facilities currently displayed on the screen, or you can mark/unmark a single facility. The Browse module works in much the same way as the Browse module for the regulations data base. Use Browse if you are just interested in a particular process type and are uncomfortable with building search criteria. Browse displays a list of process types for you to choose from and then automatically builds a query and searches the data base. The Query module is still available to search for other types of information.

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## WHAT'S NEW ON THE RBLC

by Jo Ann Kerrick  
ViGYAN

Information in the RACT/BACT/LAER Clearinghouse (RBLC) is updated nearly every month as users submit new control technology determinations to the data base. In addition to this information, the RBLC support staff continues to make changes to keep the system current. If you haven't been on the RBLC BBS lately, check the TTN now for the updates described below.

### New RBLC Data Fields in Standalone Editor

As you may have noticed, we recently changed the RBLC data base structure by removing extraneous dates at the facility level and adding new fields for notes about compliance verification at the process level. In addition, the cost fields at the pollutant level were expanded to accommodate larger numbers. In September we released a new version of the RBLC standalone editor designed to be compatible with these changes.

The standalone editor is an alternative to online entry of new control technology information. You can input new determinations locally on your PC and then transfer the data to the RBLC system administrator for inclusion in the online data base. While we were changing the system to be compatible with the new data base, we made some more changes to simplify the editor. We removed the edit menu and moved its functions to the facility list screen. Now you can make all updates to your determinations, including adding new ones, from a single screen. Another new option at the facility list screen lets you delete all of your old determinations and start with a blank data base. (You would use this option after you have sent your data to the RBLC). We hope these changes make the system easier and



quicker to use. If you are responsible for submitting your agency's determinations, you might want to try the standalone editor. All the files you need and installation instructions can be downloaded from the RBLC BBS.

### Ranking Reports Updated

The RBLC ranking report compares pollutant emissions for a single process type and one pollutant. Typically you perform a search for the target information, and then download your results using the ranking report format. Based on standard emission limits for each applicable determination, the report presents statistics based on these limits and then reports them in rank order listing from most to least stringent.

Because the RBLC Ranking report can be a valuable reference for users making RACT, BACT, or LAER determinations, the RBLC staff has generated ranking reports for specific process type and pollutant combinations. The reports are available for downloading to your PC without doing a query. In October all of these reports were updated to reflect the latest information in the then current RBLC data base. If you want quick access to ranking information, look for these reports in the Download section of the RBLC BBS.

### Regulation Data Base Updated

When it became available in late 1994, the regulation data base contained summaries of New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) rules then in effect. Subsequently, we expanded the data base to include entries for Maximum Achievable Control Technology (MACT) standards. As of November 1995, the data base contained 105 rules, with 21 of them updated to reflect rules proposed or promulgated in 1995. Starting in 1996, we plan to add summaries of Control Technology Guidance (CTG) documents. If you need summary information about current federal rules, the regulation data base is a good place to start.

### Help Rearranged for Process Type Codes

The RBLC uses numeric codes to group processes by category, such as combustion, surface coating, mineral

processing, etc. In fact, searching for the appropriate process type code can be the quickest way to get the control technology information you need. Performing these searches with the menu-driven search just became a little easier. You still choose a major category from a two-page display of 2-digit process type codes from 10 to 99. Now, however, the system displays the list of available detail codes in alphabetical order by the process name, rather than in numeric order. You can quickly scan the list for the process you want and find the appropriate code for it. We hope this improvement makes the RBLC easier to use.

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## LANDFILL

*(continued from page 5)*

on the file name in the Windows File Manager or type the file name in DOS and hit enter. (NOTE: All software components for each version should be located in the same directory prior to execution.)

For the DOS MODEL, go to the directory that contains the expanded files and type LANDFILL to execute the model. (SPECIAL NOTE: Hercules graphics card users should execute the MSHERC.COM program prior to running the model. This component is required to view graphical output with these cards.)

For the WINDOWS MODEL, use the FILE-RUN selections from the File Manager menu to execute the LANDWIN.EXE file to start the model. (Additional Note: This program will make a modification to your WIN.INI file to save setup information about the model.)

More details about the design and use of both the DOS and Windows versions of the landfill model are provided in the User's Manual, Landfill Air Emissions Model. This manual is also available on the CTC BBS and HOME PAGE.

For questions/problems with the model contact Susan Thorneloe at:

E-Mail:

thorneloe.susan@epamail.epa.gov

FAX: (919) 541-2382 or (919) 541-7885

MAIL: U.S. EPA/APPCD, MD-63, RTP, NC 27711

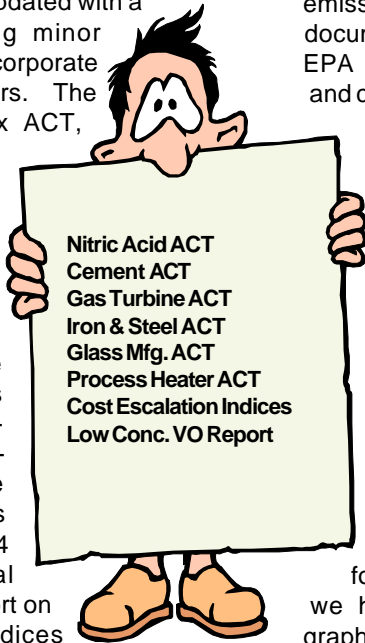
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## SELECTED EPA REPORTS NOW ON CTC BBS!

By Joe Steigerwald  
CTC, OAQPS

The most popular new items in the CTC BBS' Downloading area are the NOx Alternative Control Documents (ACTs). In the last few weeks electronic copies of 6 of the 9 NOx ACTs have been placed on the CTC BBS. The ACTs that are currently available are: cement; nitric and adipic acid manufacturing; gas turbines; iron and steel; glass manufacturing; and process heaters. One of the remaining three ACTs, internal combustion engines, should be available shortly along with the OAQPS Control Cost Manual which provides comprehensive procedures and data for sizing and costing control equipment and is being updated with a few remaining minor changes to incorporate all the chapters. The final two NOx ACT, nonindustrial boilers and industrial boilers, may not be available for a month or two but they will be on the CTC BBS as soon as possible. In addition to the ACTs, copies of the 1994 CTC Annual Report, a report on escalation indices for air pollution control costs, a revised status list of the newer CTG and ACT documents, and a report entitled "Survey of Control Technologies for Low Concentration Organic Vapor Gas Streams" have also been placed on the CTC BBS for downloading. See the man with a complete list of new files available.

As a matter of background informa-



Nitric Acid ACT  
Cement ACT  
Gas Turbine ACT  
Iron & Steel ACT  
Glass Mfg. ACT  
Process Heater ACT  
Cost Escalation Indices  
Low Conc. VO Report

tion on the ACTs: Congress, in the Clean Air Act Amendments of 1990 (CAAA), amended Title I of the Clean Air Act (CAA). A new Subpart 2 was added to Part D of Section 103. Section 183© of the new Subpart 2 provides that:

*[w]ithin 3 years after the date of the enactment of the [CAAA], the Administrator shall issue technical documents which identify alternative controls for all categories of stationary sources of...oxides of nitrogen which emit, or have the potential to emit 25 tons per year or more of such air pollutant.*

Each source category for which an ACT has been issued has been identified as a stationary source that emits more than 25 tons of NOx per year. Each ACT document provides technical information for use by State and local agencies to develop and implement regulatory programs to control NOx emissions. The information in an ACT document is generated from previous EPA documents, literature searches and contacts with industry; engineering firms; control equipment vendors; and federal, state, and local regulatory agencies.

All of the ACT documents as well as the other new items on the CTC BBS, are available in a variety of formats. The CTC BBS usually offers reports in WordPerfect 5.x and WordPerfect for Windows 6.1 formats as a matter of course. We also try to put documents up in ASCII text format when the conversion into ASCII will not cause the loss of important information or formatting. In addition, we have recently been putting up graphic intensive reports in Envoy format. The Envoy format is nice because it allows any user using Microsoft Windows to view and print the report. In addition, for very large reports, the Envoy format shrinks the size of the file somewhat.

So, sign into the OAQPS Technology Transfer Network and log in to the CTC area and download a file today!

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## ICCR

(continued from page 3)

sources are scheduled for regulation under section 112, and/or section 129 of the Clean Air Act. The ICCR would also consider regulations under section 111 for the five categories. The source categories are as follows: ICI boilers, process heaters, solid waste incinerators, stationary gas turbines, and stationary internal combustion engines. The Clean Air Act requires regulations for most of the above categories to be promulgated by November 2000.

### BENEFITS OF ICCR

The ICCR offers considerable benefits to all stakeholders, including environmental groups, the regulated community, and state/local regulatory agencies. For example:

- Opportunity for stakeholders to shape regulatory development and influence the outcome.
- A wider range of pollutants and sources will be addressed in a coordinated fashion.
- More cost-effective and less costly regulations.
- The potential for conflicting or duplicative regulations will be avoided.
- Simpler regulations, Compliance flexibility.
- Stakeholder resource savings.
- Improved scientific basis for regulation.

The proposed process relies on interested stakeholders to play a key role in all phases of regulatory development through representation or membership on a Coordinating Committee and Source Work Groups, formed under the auspices of the Federal Advisory Committee Act.

The general communication plan for this project is to keep interested persons apprised on the status of the rulemaking and to transfer information by using EPA's TTN bbs. The ICCR board on the TTN has been operational since June 19, 1996 and will serve this purpose. For more information, please refer to the document, "Industrial Combustion Coordinated Rulemaking - Proposed Organizational Structure and Process". It can be obtained through the TTN.

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## CTC RESOURCES ORDER FORM

The CTC provides reports and software resulting from its efforts to government personnel free of charge. (Others may order them from the National Technical Information Service using the "PB" numbers shown here.) Below is a list of CTC resources published in the past two years. The CTC is happy to provide its resources to government personnel. However, because of the large response we anticipate to this list, we ask that you limit your request to the resources for which you have an immediate need and the quantity to one. To order CTC resources, COMPLETE FORM AND MAIL INFORMATION (on reverse side), CUT OUT FORM, FOLD, STAPLE/TAPE CLOSED, APPLY POSTAGE AND MAIL TO THE CTC.

### REF NO. AIR TOXICS

- 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
- 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); PB95-172987 (manual only)
- 141 ( ) "New Regulation Controlling Air Emissions from Chromium Electroplating and Anodizing Tanks," EPA-453/F-95-001
- 142 ( ) "New Regulation Controlling Air Emissions from Solvent Cleaning Machines (Degreasers)," EPA-453/F-94-083
- 143 ( ) "A Guidebook on How to Comply with the Chromium Electroplating and Anodizing NESHAP," EPA-453/B-95-001 PB95-220604
- 144 ( ) "Guidance Document for the Halogenated Solvent Cleaner NESHAP," EPA-453/R-94-081, PB95-216412

### COMBUSTION

- 66 ( ) "Characterization of Emissions from the Simulated Open-Burning of Non-Metallic Automobile Shredder Residue," EPA-600/R-93-044, PB93-172914
- 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, PB95-240412

### RACT/BACT/LAER Clearinghouse

- 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
- 145 ( ) "RACT/BACT/LAER Clearinghouse Information System (BLIS) User's Manual," EPA-456/B-95-003, PB96-183926
- 146 ( ) "RACT/BACT/LAER: A Compilation of Control Technology Determinations," Fifth Supplement to the 1990 Edition," EPA 456/R-95-005, PB96-178942
- 148 ( ) RACT/BACT/LAER Clearinghouse Flyer, October 1995
- 150 ( ) "RACT/BACT/LAER: A Compilation of Control Technology Determinations, Sixth Supplement to the 1990 Edition," EPA-456/R-96-002

### VOC - Other Source Categories

- 75 ( ) "Alternate VOC Control Technique Options for Small Rotogravure and Flexography Facilities" EPA-600/R-92-201, PB93-122307
- 93 ( ) "Alternative Control Technology Document for Bakery Oven Emissions," EPA-453/R-92-017, PB93-157618
- 96 ( ) "Automobile Plant Spray Booth Cleaning Emission Reduction Technology Review," EPA-453/R-94-029, PB94-206257
- 101 ( ) "Initial Assessment of Emissions from Heat Setting Carpet Yarn," EPA-600/R-93-161, PB93-229862
- 110 ( ) Lithographic Printing ACT
- 111 ( ) DRAFT Model Rule for Wood Furniture
- 134 ( ) "Survey of Control Technologies for Low Concentration Organic Vapor Gas Streams," EPA-456/R-95-003, PB95-241626
- 139 ( ) "Beyond VOC RACT CTG Requirements," EPA-453/R-95-010, PB95-239497

### MISCELLANEOUS

- 48 ( ) Complete List of CTC Documents
- 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
- 90 ( ) "OAQPS Cost Control Manual—Supplement 2, Gas Absorbers" EPA/450/3-90-006b, PB93-138147
- 92 ( ) "A Guidebook for Explaining Environmental Regulations to Small Businesses," EPA-453/B-93-023, PB94-120334
- 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

(continued page 10)

- 112 ( ) "Oil Suppression of Particulate Matter at Grain Elevators," EPA-453/R-94-049,
- 118 ( ) "Evaluation of a Liquid Chemical Scrubber System for Styrene Removal," EPA-600/R-94-211, PB95-167359
- 137 ( ) SAGE 2.1, "Solvent Alternatives Guide, User's Guide," EPA-600/R-95-049a
- 140 ( ) "Control and Pollution Prevention Option for Ammonia Emissions," EPA-456/R-95-002, PB95-241790
- 147 ( ) "Escalation Indexes for Air Pollution Control Costs," EPA-452/R-95-006

**Global Greenhouse Gases Technology Transfer Center**

- 80 ( ) "Development of an Empirical Model of Methane Emissions From Landfills," EPA-600/R-92-037, PB92-152875
- 82 ( ) "Landfill Gas Energy Utilization: Technology Options and Case Studies," EPA-600/R-92-116, PB92-203116
- 84 ( ) "List of Papers and Reports for EPA's Research Program on Air Emissions from Landfills and Other Waste Management Processes," updated 11/94
- 86 ( ) "Landfill Gas Recovery/Utilization - Options and Economics," EPA-600/A-92-170, PB92-217066
- 88 ( ) "Emissions and Mitigation at Landfills and Other Waste Management Facilities," EPA-600/R-92-116 (also EPA-600/R-94-008), PB94-132180
- 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

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# TECHNOLOGY NOTEBOOK

## REFRIGERATED CONDENSERS IN HAP-PRO

Lyndon S. Cox  
Senior Environmental Employee

There are two types of condensers: the surface type and the contact type. The Control Cost Manual (CCM) and HAP-PRO (type 1) calculate only the surface type. HAP-PRO defines a type

**TABLE 1: Input Data Key**

Data	Symbol	Units
Inlet Stream Flow Rate	$Q_{in}$	scfm (77°F, 1 atm)
Inlet Stream Temperature	$T_{in}$	°F
VOC Inlet Volume Fraction	$y_{voc,in}$	dimensionless ratio
VOC Removal Efficiency	$\zeta$	percent as decimal
Antoine Equation Constants	A, B, C	-----
Heat of Condensation (VOC)	$\Delta H_{voc}$	Btu/lb-mole
Heat Capacity of VOC	$C_{p,voc}$	Btu/lb-mole-°F
Specific Heat of Coolant	$C_{p,cool}$	Btu/lb-°F
Heat Capacity of Air	$C_{p,air}$	Btu/lb-mole-°F
Molar flow rate	M	-----

2 unit as one in which the area of the heat exchanger is defined, not calculated.

In a contact condenser (not addressed in either CCM or HAP-PRO) a refrigeration unit chills volatile organic compounds (VOCs), similar to those being removed. Chilled VOCs are sprayed into the emission stream to condense the vapors. Again, the CCM and HAP-PRO do not address this type of condenser.

The CCM and HAP-PRO do address the surface type of condenser, also known as the shell-and-tube type. This type of condenser has the emission stream directed into a shell. Within the shell, there are tubes which are maintained at a low enough temperature to reduce the vapor pressure of the VOCs. Condensation of VOC vapor reduces the concentration. The emission stream is then exhausted. Part of the design data is the level of VOC which is acceptable in the exhaust.

The refrigeration system must be capable of handling the heat load given up by the VOCs as heat of condensation.

And, if there is too much moisture in the air, the ice on the tubes can impair heat transfer, and the condenser will have a lower control efficiency than calculated. Therefore, in emission streams that are known to have a high moisture content, a precooler is necessary. The precooler operates at about 35°F to condense most of the water.

The input data for the design of this refrigeration unit is in Table 1. HAP-PRO erroneously calls for the specific heat of the coolant to be in Btu/hr-ft<sup>2</sup>-°F; it should be in Btu/lb-°F. However,

as long as the correct numerical value is given, it will compute properly.

The air is considered to be noncondensable, which is true at these temperatures. Since the partial pressure of the

VOC can be raised by either compression or cooling, it is a given in the calculations that the condenser operates at atmospheric pressure. We must calculate the temperature at which condensation occurs.

First we use the equation:

$$P_{voc} = 760 \frac{Y_{voc,inlet} (1-\eta)}{1 - Y_{voc,inlet} (\eta)}$$

HAP-PRO uses the less obvious, but equivalent, calculation:

$$P_{part} = 760 \frac{(1 - 0.1 * RE)}{[1 - (RE * 10^{-8} * HAP_e)]} * HAP_e * 10^{-6}$$

where

RE = Removal Efficiency

HAP<sub>e</sub> = HAP concentration in the emission stream, ppm

This assumes that at the outlet the gas stream is at equilibrium with the VOC condensate.

In the CCM, this leads to the equation:  $T_{con} = \frac{(B - C)}{A - \log_{10} \frac{P}{P_{voc}}}$

Now we know the temperatures we must obtain. The heat load is then equal

$$\text{to: } H_{load} = \Delta H_{con} + \Delta H_{uncon} + \Delta H_{noncon}$$

where:

$\Delta H_{con}$  = enthalpy change of condensed VOC

$$\Delta H_{con} = M_{voc,con} [\Delta H_{voc} + C_{p,voc} (T_{in} - T_{con})]$$

$$M_{voc,con} = M_{voc,in} - M_{voc,out}$$

$$M_{voc,out} = M_{voc,in} (1 - \eta)$$

$\Delta H_{uncon}$  = enthalpy change of uncondensed VOC

$$\Delta H_{uncon} = M_{voc,out} C_{p,voc} (T_{in} - T_{con})$$

$$\Delta H_{noncon} = [(60Q_{in}/392) - M_{voc,in}] C_{p,air} (T_{in} - T_{con})$$

HAP-PRO computes the number of moles in the inlet stream:

$$HAP_{em} = \frac{(Q_{e,HAP} e^{-10^{-6}}) * 60}{392}$$

Then the number of moles in the outlet stream:  $HAP_{om} = HAP_{em} * \left[ \frac{1 - (RE)}{100} \right]$

Then the number of moles condensed is:  $HAP_{con} = HAP_{em} - HAP_{om}$

Then HAP-PRO computes the heat load just as the CCM does it, but erroneously uses the  $C_{p,air}$  instead of the  $C_{p,voc}$  in computation of the enthalpy change in the uncondensed VOC. This minor error was not previously discovered because it is negligible.

Next, the CCM addresses the heat exchanger or condenser. The Chemical Engineers Handbook gives values of 20 to 60 Btu/hr-ft<sup>2</sup>-°F for examples of brine cooled tubes condensing VOC. The CCM uses a conservative heat transfer estimate of  $U = 20$  Btu/hr-ft<sup>2</sup>-°F. HAP-PRO uses this as the default value, but allows other values to be entered.

The coolant is brine, which must be chilled to about 15 °F below the condensation temperature. The temperature of the brine will rise to 25 °F above the condensation temperature in a properly sized counterflow heat exchanger. These values must be used in the following equations.

The condenser then becomes defined by:

$$A_{con} = H_{load} / U \Delta T_{lm}$$

The coolant flow rate is given by:

$$W_{cool} = H_{load} / C_{p,cool} (T_{cool,out} - T_{cool,in})$$

And the refrigeration capacity is defined as:

$$R = H_{load} / 12,000 \text{ tons}$$

The flaws that have been detected will be corrected.

### CTC ASSISTANCE

No cost assistance to staff of State and Local agencies, EPA Regional Offices, and others on air pollution control technology issues.

**CTC HOTLINE:** CALL (919) 541-0800 to access EPA expert staff for consultations, references to pertinent literature, or access to EPA technical data and analyses. No question is too simple!

**CTC FAX:** You can send a request for any CTC service listed here by FAX. Our Fax numbers are: (919) 541-0242 or (919) 541-0361.

**CTC BBS:** Call (919) 541-5742 for up to 14400 baud modem to access the CTC Bulletin Board. Set communications parameters to 8 data bits, N parity, and 1 stop bit, and use a terminal emulation of VT100 or VT/ANSI. You may leave HOTLINE requests, order documents, suggest projects, and download documents and software. The BBS is part of the OAQPS Technology Transfer Network (TTN). In addition, the TTN may be accessed via the Internet at 'ttnwww.rtpnc.epa.gov' or through the EPA Home Page on the World Wide Web. The TTN also has an FTP site for downloading files at 'ttnftp.rtpnc.epa.gov'.

**FEDERAL SMALL BUSINESS ASSISTANCE PROGRAM (FSBAP):** The FSBAP is available through the SBAP BBS on the TTN (see CTC BBS for connection information), or the CTC HOTLINE or FAX. The FSBAP provides support to State Small Business Assistance Programs.

**US-MEXICO INFORMATION CENTER ON AIR POLLUTION (CICA - Centro de Información sobre Contaminación de Aire):** Call the CICA Information line (919) 541-1800 (Spanish) or the CTC HOTLINE (English) to access technical support and assistance in evaluating air pollution problems along the Mexico-US Border.

**INTERNET/WORLD-WIDE WEB ACCESS:** Send E-Mail to 'blaszczak.bob@epamail.epa.gov'. In addition, you may access our services through the following sites:

For CTC - '<http://www.epa.gov/oar/oaqps/ctc.html>'

For FSBAP - '<http://www.epa.gov/oar/oaqps/sbap.html>'

For CICA - '<http://www.epa.gov/oar/oaqps/cica/CICA/>'

**RACT/BACT/LAER CLEARINGHOUSE (RBLC):** The RBLC data base is available on the OAQPS TTN BBS (see CTC BBS for connection information). The Clearinghouse provides summary information on control technology and pollution prevention (P2) determinations made by permitting agencies, and on EPA emission standards and control techniques guidelines.

**ENGINEERING ASSISTANCE PROJECTS:** If you need in-depth assistance concerning a specific control technology or pollution prevention problem, contact the CTC. EPA staff and contractors are available for short-term projects such as review of proposed or existing control or prevention measures. Projects are subject to CTC Steering Committee approval.

**TECHNICAL GUIDANCE PROJECTS:** The CTC may also respond to a number of similar requests on issues of national or regional interest by undertaking broad, long-term projects. The result may be a control technology document, PC software, seminar, or workshop.

**INTERNATIONAL TECHNOLOGY TRANSFER CENTER FOR GLOBAL GREENHOUSE GASES (ITTCGGG):** Call the CTC HOTLINE to access ITTCGGG information on greenhouse gas emissions, prevention, mitigation, and control strategies.

**MAIL:** Address conventional mail inquiries to: CTC (MD-12), U.S. EPA, RTP, NC 27711.



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