



THE CHIEF NEWSLETTER

— THE CLEARINGHOUSE FOR INVENTORIES AND EMISSION FACTORS —



Many people assume that AP-42 has all the answers to questions about estimating air emissions from a source category (or even specific source). Although that is giving this most excellent document more credit than it is due, you can use AP-42 emission factors to estimate emissions when specific source test information is not available from the source or an almost identical source. Under ideal conditions all of the needed emission factors are in the section that addresses the source category from which you are trying to estimate emissions. This use of the process specific emission factor would result in an estimate that is potentially in error by the inherent variability of the AP-42 emission factor. This variability is dependent on the process and the representativeness of the data used to develop the emission factor. However, the usual situation is that some of the emission points or pollutants that you are trying to estimate emissions for are not in the section.

By accepting the risk of additional error, emission estimates can sometimes be made by using emission factors for other process sources that are in AP-42. A good working knowledge of the physical characteristics of the processes that are being compared is needed. For example, the particulate emissions from different types of dryers would depend on the material being dried and the fuel used to supply the heat. A process that dried fabric using indirect heat from a process (using heat exchangers) would have significantly different emissions from a process that was drying a crushed mineral using direct heat from pulverized coal combustion. As a result, emission factors for these two processes would not be interchangeable.

Following an investigation of the key operating and physical characteristics of a process, the known characteristics of potential similar sources should be obtained. This type of

information is sometimes available in the process description for the individual source categories. Other available resources are the compliance inspectors or other individuals that have visited the source categories that are believed to be similar. Generally, all of the information that is available on the source category is published in either the AP-42 section or the background report for the section. In addition, any usable information that is not in a final AP-42 section is available on the **CHIEF** BBS under "Draft Sections Under Review." Therefore, calling the person responsible for the development of the section would not reveal any additional relevant information. If a suitable contact person is not known, posting a message to the **CHIEF** BBS public message board may reveal a suitable contact to get more detailed process information or a person that has already done all of the work to identify the best surrogate for the process being evaluated.

A simple checklist can be assembled to compare the process of interest to all the potential surrogates that have been identified. The pertinent variables should be listed below the surrogate processes in approximate importance. Then a qualitative comparison with the process of interest should be made to identify whether the surrogate process is estimated to have lower, higher or about the same emissions as the process of interest. This is where your homework into the process conditions becomes most important. The choice of what surrogate emission factor should be used is a matter of selecting the best fit from the surrogate possibilities. This will also allow you to evaluate whether your choice is an under estimate or an over estimate. You may wish to make adjustments to the factor to make the estimate closer to what you believe is the most appropriate (or to provide some margin of safety).

THE AP-42 FIFTH EDITION IS DONE!

After months of anticipation, the Fifth Edition is now on both the **CHIEF** BBS and the **Fax CHIEF**. It will be available on the **Air CHIEF** CD-ROM by early June and on paper by the end of June.

Call **Info CHIEF**, (919) 541-5285, for more information. Order paper copies now from the Government Printing Office, (202) 512-1800, Stock No. 055-000-00500-1, price \$56.00.

(Cont. from p. 1)

The following example will illustrate the above methodology:

You are asked to estimate PM-10, NO_x and CO emissions from two product dryers at a plant. The same product is being dried by the two dryers. However, one of the driers uses oil or gas to dry the product and the other dryer uses waste heat from another process at the plant. The product that is being dried is a material that has been sized to a powder, 90 percent of which will pass through a 100 mesh screen. The material entering the dryer has been de-watered mechanically with a typical residual moisture content of 5 percent. After drying, the moisture content of the product is less than ½ percent. The product is not physically or chemically changed as a result of the drying. The dryer is an inclined rotary kiln that is fired counter current to the product flow. The drier that is fossil fuel fired uses a combination burner firing either number 2 fuel oil, natural gas or a combination of both. One gallon of fuel oil, or 131 cubic feet of gas, can dry approximately one ton of product.

Although your process is not included in AP-42, there are similar processes in AP-42 where there are emission factors. These processes include portland cement manufacturing (wet process or long dry process), lime manufacturing (gas fired), batch mix hot mix asphalt (HMA) production, taconite ore processing (indurating furnace), phosphate rock processing (dryer), oil combustion and gas combustion. The closest process for these sources in AP-42 has the information shown in Table 1:

TABLE 1. Emission factors for processes with similar characteristics to dryers evaluated.

Process	Filterable Particulate	Filterable PM-10	NO _x	CO
Portland Cement Manufacturing (wet process)	130	31	3.7	0.06
Portland Cement Manufacturing (long dry process)	250	ND	3.0	0.11
Lime Manufacturing	180	22	1.7	1.1
HMA Production (gas fired)	16 (.004 condensable)	2.2 (.004 condensable)	0.025 0.04	0.34 0.018
HMA Production (oil fired)	16 (.045 condensable)	2.2 (.045 condensable)		
Taconite Ore Processing	29.2	ND	ND	ND
Phosphate Rock Processing	5.7	4.8	ND	ND
Oil Combustion (fuel basis)	2 lb/gal	1 lb/gal	20 lb/gal	5 lb/gal
Oil Combustion (process basis)	2 lb/ton	1 lb/ton	20 lb/ton	5 lb/ton
Gas Combustion (fuel basis)	4.5 lb/MMcf	4.5 lb/MMcf	100 lb/MMcf	21 lb/MMcf
Gas Combustion (process basis)	0.006 lb/ton	0.006 lb/ton	0.13 lb/ton	0.03 lb/ton

ND = No Data

In evaluating the processes for similarities with the process being estimated, the following characteristics are known:

Portland Cement Manufacturing - Both processes are coal fired and the raw material is physically and chemically changed in the process. The process reaches very high temperatures and although a significant amount of heat is reused in the process to conserve fuel probably more fuel is combusted than would be necessary for drying the material. Therefore, the combustion products NO_x and CO, are not similar to the dryer of concern. However, the raw material feed to the process is either in the form of a slurry or a finely divided dry material, so that the particulate emissions may be physically carried out of the process in a manner similar to the dryers in question.

Lime Manufacturing - The process of manufacturing lime is very similar to portland cement manufacturing. Although the emission factor is for gas fired kilns, the combustion conditions are similar to those of portland cement manufacturing and therefore not reflective of the process in question. However, like portland cement manufacturing, the raw material feed to the process is either in the form of a slurry or a finely divided dry material, so that the particulate emissions may be physically carried out of the process in a manner similar to the dryers in question.

Hot Mix Asphalt Manufacturing - Batch mix asphalt plants heat a mixture of aggregate to a relatively warm temperature so that the mixture when combined with asphalt will stay formable after transport. The aggregate mixture contains a relatively high percentage of fines (< 75µm physical diameter) but may also contain material up to ¾ inch in diameter. The moisture content of the aggregate is typically 1½ percent or less. As a result of the larger material being contained in the batch plant aggregate these factors may underestimate the particulate emissions from the process being evaluated. However, the combustion conditions may

(Cont. on p. 3)

(Cont. from p. 2)

be similar to the dryer being evaluated since the higher temperatures encountered in the batch mix plant are compensated by the lower moisture content of the feed material.

Phosphate Rock Processing - Dryers at phosphate rock plants would not estimate particulate emissions from the dryers of concern since the material smaller than 150 mesh is removed from the raw feed material and sent to a tailings pile.

Oil Combustion and Gas Combustion - Since no material is being dried these factors would not be suitable choices for estimating the particulate emissions from the dryers of concern. However, the products of combustion (NO_x, CO, TOC, CO₂ and SO₂) should always be considered when evaluating any combustion source. It should be remembered that the emission factors are for combustion in a water boiler and therefore the combustion conditions will be significantly different from many direct fired process heater/dryer/calciner.

A selection process that uses the above information may be performed for evaluating the various process similarities. The evaluations of the similarities are entered into a simple table with estimates as to whether each process would underestimate, overestimate or be reflective of the process being evaluated. The tables 2, 3 and 4 illustrate the methodology for this example.

Table 2. Evaluation of similarities of processes for PM-10.

(Cont. on p. 4)

PM-10 evaluation					
	Characteristic Evaluated				Totals
Process	Process Feed	Physical Process	Fuel & usage	Product	Number of Good Matches and ±
Portland Cement	G	G	-	-	2/-
Lime Manufacturing	G	G	-	-	2/-
Hot Mix Asphalt	++	+	G	+	1/++++
Taconite Ore	++	+	+	+	0/++++
Phosphate Rock	++	+	G	+	1/++++
Oil Combustion	+++	+++	G	+++	1/+++++
Gas Combustion	+++	+++	G	+++	1/+++++

Table 3. Evaluation of similarities of processes for NO_x.

NO _x evaluation					
	Characteristic Evaluated				Totals
Process	Process Feed	Physical Process	Fuel & usage	Product	Number of Good Matches and ±
Portland Cement	NA	-	---	NA	0/---
Lime Manufacturing	NA	-	---	NA	0/---
Hot Mix Asphalt	NA	G	G	NA	2/
Taconite Ore	NA	-	-	NA	0/--
Phosphate Rock	NA	G	-	NA	1/-
Oil Combustion	NA	-	-	NA	0/--
Gas Combustion	NA	-	-	NA	0/--

Table 4. Evaluation of similarities of processes for CO.

CO evaluation					
	Characteristic Evaluated				Totals
Process	Process Feed	Physical Process	Fuel & usage	Product	Number of Good Matches and ±
Portland Cement	NA	-	---	NA	0/---
Lime Manufacturing	NA	-	---	NA	0/---
Hot Mix Asphalt	NA	G	G	NA	2/
Taconite Ore	NA	-	-	NA	0/--
Phosphate Rock	NA	G	-	NA	1/-
Oil Combustion	NA	-	-	NA	0/--
Gas Combustion	NA	-	-	NA	0/--

(Cont. from p. 3)

As can be seen in the evaluations for particulate, any of the particulate emission factors for portland cement manufacturing or lime manufacturing may be appropriate choices, considering that there are two good matches and only two situations where factor may be underestimates. However, given the uncertainty of the estimates, a value of 200 lb of total particulate and 30 lb of total PM-10 is chosen. Since hot mix asphalt production is the only process which has an estimate of condensable emissions, those factors would be used if a very efficient (99 percent or better) air pollution control device were installed. The emission factors for NO_x and CO from the hot mix asphalt production are selected because the firing conditions appear similar to the process of concern and had the highest ratings in the tables. ✍

WE HEAR YOU!

A recent issue asked you to tell us what source categories you'd most like to see addressed in AP-42. The most frequently mentioned topic was "Welding", and we're glad to report that a new section on this activity is included in the emergent Fifth Edition. This section is already on the *CHIEF* BBS. Also mentioned was "Electroplating And Metal Finishing", now on the *CHIEF* BBS in draft form.

We do like your comments and suggestions, and we try to comply. Thanks for letting us know.

EFIG: KEEPING YOU INFORMED

Due to the influx of inquiries regarding the *1990 Clean Air Act Amendments* Title V Permits, the Emission Factor And Inventory Group has seen an increase in client support. In March 1995, the *CHIEF* Bulletin Board System (BBS) was accessed over 5,400 times by 3,000 users. These users downloaded over 7,200 files, making it the second most used BBS out of seventeen bulletin board systems on the OAQPS TTN! *Fax CHIEF*, our automated document delivery service, was accessed 655 times to successfully transmit 924 AP-42 sections or guidance papers to end users. The *Info CHIEF* help desk responded to 965 phone calls and the EPA technical staff responded to 485 phone calls, for a grand total of 1,450 phone calls among eight individual staff members!

We apologize for any frustrations you may encounter when trying to contact us, but as you can see, we are keeping very busy with requests for information. We encourage you to utilize the *CHIEF* BBS and *Fax CHIEF* services before coming to us with technical questions, but the *Info CHIEF* help desk is always available when you need technical assistance, (919) 541-5285. ✍

REGIONAL CONTACT CORRECTIONS:

The Winter 1995 *CHIEF Newsletter* incorrectly lists Henry Feingersh as the Region II contact for O₃/CO Inventory. The contact should be **Demian Ellis, (212) 637-4249.**

The new Region III contact is **Rose Quinto, (215) 597-9800 ext. 3164.**

The PM-10 contact name for Region X was misspelled. It should read: **Rindy Ramos, (202) 553-6510.**

STATUS OF CONSOLIDATED EMISSION REPORTING RULEMAKING

An Emissions Data Reporting Options Paper was distributed for comment in December 1994. The comments were compiled and summarized and are on the *CHIEF* BBS under the "Factor & Inventory Information, Important Memos & Letters" menu item. The file name is EM-OP-CM. Thirty-two people provided comments representing seven EPA Headquarters groups, eight EPA Regional Offices, four state and two local air pollution agencies. The insights provided by the reviewers will help EPA's understanding of the issues that impact both providers and users of emissions information. Concerns ranging from the burden placed on data providers to the utility of the information for data users will be taken into consideration as EPA evaluates methods for obtaining emissions information. EPA management is being briefed on the comments and the Work Group will be meeting to decide on the next steps for the rulemaking effort. ✍

INTERNATIONAL INVENTORY CONFERENCE OCTOBER 10-13, 1995 ~ RALEIGH, NC

The Emission Inventory: Programs And Progress, an international specialty conference sponsored by the Air & Waste Management Association and the U. S. EPA has been rescheduled to be held **October 10-13, 1995 in Raleigh.** The conference will address the development, use and improvement of emission inventories, and will focus on evolving methods and issues in the inventory development process. Papers are invited for this conference and will be accepted until May 15. **For more information regarding paper submittals, contact Garry Brooks, (919) 461-1360 or fax, (919) 461-1416.**

QUESTIONS & ANSWERS

In the Fall 1994 issue of the *CHIEF Newsletter*, we asked for readers' questions and comments concerning emission estimation tools. Here are some questions our readers asked with answers from the *Info CHIEF* help desk.

Q: May we get a copy of *FIRE* for *Microsoft Windows*®?

A: The latest version (3.0) of the Factor Information Retrieval System (*FIRE*) operates under the *Microsoft*® (MS) Disk Operating System (DOS). Although *FIRE* is a MS-DOS program, it contains a user interface which simulates a Windows environment—including pull-down menus and mouse capabilities. Plans for a *Windows*® version of *FIRE* have been delayed, but this new format may appear as early as Spring 1996. Nonetheless, you can always download the latest version of *FIRE* from the *CHIEF* BBS under the "AP-42/E F Guidance" menu item.

Q: When will the *Air CHIEF* CD-ROM, which includes the Fifth Edition of AP-42, be available, and how much will it cost?

A: The *Air CHIEF* CD-ROM version 4.0 should be available by July 1995 from the U. S. Government Printing Office (GPO), (202) 512-1800. Cost has not yet been determined but we estimate that it will be about \$20. This version of *Air CHIEF* will require *Microsoft Windows*® and will include the Fifth Edition of AP-42, several AP-42 background reports, plus *FIRE*, all *Locating & Estimating* (L & E) documents, the Source Classification Codes (SCC), Standard Industrial Codes (SIC), and the Registry Of Toxic Effects Of Chemical Substances (RTECS) Synonym list.

Q: Should not there be some type of table of contents file that one can read for the AP-42 on the *CHIEF* BBS? Right now, if you do not know the section numbers, you do not know which section to download.

A: Each of the AP-42 files on the *CHIEF* BBS includes a short title description along with the file name, so location of the section you need should be fairly easy. AP-42 is structured so that each chapter pertains to a general type of industry, such as "Evaporation Loss Sources" or "Metallurgical Industry", and sections within each chapter pertain to particular industry processes, such as "Surface Coating" or "Ferroalloy Production". When using the *CHIEF* BBS to obtain AP-42 sections, you will go through a series of menus, the first of which lists each chapter and its short title. Just select the general industry category of your choice to get a more detailed list of the sections within each chapter. From this menu, you can select the specific industry process of your choice by the short title description for each section.

If you would like to see a hard copy of the AP-42 table of contents, you can call *Fax CHIEF* from your fax machine, (919) 541-5626 or -0548, and select document number "1" to have the table of contents faxed to you. Call *Info CHIEF* for further details.

Q: When are the services of the *CHIEF* BBS going to be available through the Internet?

A: The Office of Air Quality Planning and Standards (OAQPS) Technology Transfer Network (TTN), of which the *CHIEF* BBS is a part, has been accessible through the Internet for some time now. You can connect to the OAQPS TTN by using TELNET, a protocol or software that allows your computer to communicate with the TTN Internet host.

Unfortunately, not all types of TELNET interfaces allow the user to download most files (binary files) from the TTN, although ASCII text files can usually be downloaded or "captured". In order to be able to download binary files using TELNET, you must either have a KERMIT protocol or a slip account. KERMIT is a protocol that allows binary file transfers between your terminal and the Internet host server. A slip account is a serial line interface protocol that allows you to dial into your Internet host through a modem and uses the protocols associated with the modem communication software. Check your computer system setup or contact your computer system administrator to see if either of these options are available to you.

Many sites on the Internet are known as File Transfer Protocol (FTP) sites, which are data file servers that allow both ASCII and binary file downloads by remote Internet users. Plans are in effect to create an FTP site for the OAQPS TTN, which would alleviate the current barriers for downloading, but no date has been set for its completion. If you would like to try accessing the *CHIEF* BBS through the Internet, TELNET to ttnbbs.rtpnc.epa.gov.

Q: How can I obtain the L & E document series? How much will it cost?

A: All of the L & E documents, a guidance series for locating and estimating sources of specific toxic air pollutants, are available from the National Technical Information Service (NTIS), 1-800-553-6847. The cost of each of these documents varies and is determined by NTIS. Many of the recent or "popular" L & Es may be downloaded from the *CHIEF* BBS, which is accessible via modem, (919) 541-5742 or via Internet (see above). They are also available on the *Air CHIEF* CD-ROM. If you would like more information about the L & E documents, contact *Info CHIEF*. ✉

**Info CHIEF
Help Desk
(919) 541-5285**





EFIG EMISSION ESTIMATION TOOLS STATUS UPDATE



AP-42: The Fifth Edition *Compilation Of Air Pollutant Emission Factors* (AP-42) is now in its final stages of editing and reformatting. In April it was ready to go to the Government Printing Office for printing in its 2,017 pages of "glory." It normally takes 8 weeks for printing, and a few days for distribution and stocking, so it should be on sale in the GPO sales offices and mail order by July 1, 1995. The price will be \$56 per copy, which will include all information and updates published to date, along with materials that have been residing on the *CHIEF* Bulletin Board System (BBS) and *Fax CHIEF* since *Supplement F*.

FIRE: The Factor Information Retrieval System (*FIRE*) is being updated sequentially with AP-42. New criteria, toxic/hazardous and global warming factors are being included. Currently, the files are being cross-checked with the AP-42 files to verify that they present the same factor for the same process, and that Source Classification Codes have been properly defined/transferred. Any corrections or deletions of out of date information in *FIRE* should be completed soon. The criteria and toxics modules will be updated then, but global factors will not be completely updated till mid-summer '95. The *FIRE* files on the *CHIEF* BBS will continue to be updated periodically, no less frequently than annually, but not likely to be updated more than two or three times per year. Hopefully, AIRS will be modified to take machine loaded updates from *FIRE* within a year or so.

Source Classification Codes (SCC): The latest SCC file is now located on *CHIEF* and can be accessed interactively. Ron Ryan updates the file approximately quarterly. The updated SCCs are also given to *AIRS* for updating into the *AFS*, which is now viewed as the "official" file.

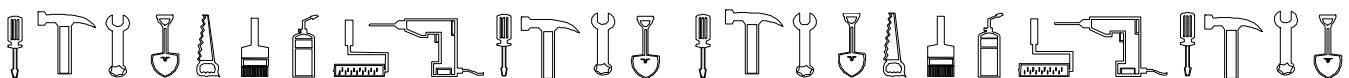
SCC/Factor Report: There continues to be demand for a hard copy list of emission factors and SCCs. *FIRE* will be used to produce a hard copy document for criteria pollutants by about June '95, which will resemble the old *AFSEF* report last produced several years ago. Many changes have been made since then. This report may also go on the *CHIEF* BBS for downloading, if desired.

Air CHIEF CD-ROM: The *Air CHIEF* CD-ROM will be improved with a new search engine (*Folio VIEWS*®), which will make searches easier and quicker. The initiation of the pressing of the delayed CD-ROM has awaited the completion of the final electronic files for the 5th Edition of AP-42, quality assurances/corrections of *FIRE*, and other components. New *Locating & Estimating . . .* documents issued since the last version will be included. The new version (4.0) will be produced and sold by GPO and is planned for release in June 1995, at a cost of \$18.

TANKS: The software for calculating emissions from organic liquid storage vessels is now being updated and improved to include new seal factors and other technical improvements. The new software is to be completed by early summer and put on the *CHIEF* BBS. This new version of *TANKS* is not expected to be available in time to be included in the *Air CHIEF* CD-ROM version 4.0, though the current MS-DOS version will be included for downloading to one's hard drive.

CHIEF BBS and Fax CHIEF: The *CHIEF* section of the TTN electronic bulletin board and the "fax back" device we call *Fax CHIEF* will continue to be major vehicles for dissemination of information and updated emission factors. We continue to "push" our clients to help themselves with these services rather than calling our staff who are overburdened with 500 or more calls per month wanting emission factor assistance. All updates to AP-42 are first put on the *CHIEF* BBS and *Fax CHIEF* and are final sections before they are accumulated periodically and printed (usually on an annual basis) in paper form.

APTI Satellite Training: On April 26, 1995, there was a satellite down link to the APTI/NC State centers established around the country for a session aimed at assisting the states put together information packages on emission estimation that they can pass to industry, etc. for permit purposes. Our tools were discussed as well as other methods of estimation, and other issues related to permits. The audience was composed of both inventory and permit personnel. Industry representatives were admitted as space was available. The crux of the presentation was to get the users of the information to go to documents, *CHIEF* BBS, *Fax CHIEF*, *FIRE*, *TANKS*, etc. as much as possible without calling the EFIG staff. ✍



"TLC" — AP-42 TEAM LEADER'S CORNER

This month I have a plea. The EPA AP-42 Team has been responding to over 450 telephone calls a month related to estimation of emissions for permits. Our limited staff is sympathetic with the needs of all of our clients, but we cannot do productive work to improve emission factors and other tools that we produce while responding to telephone calls. Please review the references, review the background documents, check the **CHIEF** BBS for any related questions and answers that others may have generated, and take every effort possible prior to calling the staff regarding a specific factor. Chances are that if we have the information, we will have already published it somewhere in the tools we have. Also, if you do need to contact us directly, first put a question on the **CHIEF** BBS. These messages are easier to respond to efficiently and make it easier to share the question and answer with others. If you do place a phone call and get someone on the line or have to leave a voice mail message, please be patient and remember that we are trying to support and service the permit community as part of our clientele, but our organizational charter does not really give us responsibilities in that area.

The AP-42 Team has been working extremely hard to get the Fifth Edition of **Compilation Of Air Pollutant Emission Factors**, AP-42, published and available for distribution. We have continued to have more delays than we anticipated, and we apologize for any inconveniences you may be experiencing as a result. Please see the update on page 6 for information on the latest expected releases of AP-42, **FIRE, TANKS, Air CHIEF**, and the other emission factor estimation tools which fall under the purview of the AP-42 Team, composed of Dennis Beauregard, Roy Huntley, Whit Joyner, Ron Myers, Ron Ryan, Dallas Safriet and me. In spite of the problems we have had getting these products to you in the manner we expected, we were very pleased to receive many supportive comments from our clients as we were in the process of updating our mailing key. Please feel free to communicate with us via mail and the **CHIEF** BBS—we appreciate your input because it helps us focus our limited resources on the highest priorities of our clients. Thanks! ✍

— Jim Southerland
southerland.jim@epamail.epa.gov

ADOPT-A-FACTOR

The "Adopt-a-Factor" program was proposed to be a means of support for state emission factor development projects by providing funds through the grant process. Under the current climate, we now expect that the program grants for this activity will be rolled together with other funds into the popular "block grant" process. We will still make an effort to coordinate and act as a sounding board and clearinghouse for emission factor development activities, but to a lesser degree than we had first envisioned. Check future issues of the **CHIEF Newsletter** for more definitive and final news regarding this topic. ✍

EPA EMISSION INVENTORY CONTACTS MEETING

The second EPA Emission Inventory Contacts meeting was held in Research Triangle Park, NC, on March 29 - 30. The meeting was hosted by the Emission Factor And Inventory Group. Attendance at the meeting was good, with representatives from nine of the ten EPA Regional Offices, from the Office Of Mobile Sources, and from several groups within OAQPS.

Agenda items included Periodic Emission Inventories, Federal Register Processing of 1990 SIP Inventories, documenting inventory reports and data bases on compact disk-read only memory (CD-ROM), AIRS, and the Emissions Reporting Rule. Status reports were presented on several other activities. The primary follow-up activity to the meeting will be the gathering of electronic files (text and data bases) that make up the 1990 SIP inventories to archive on CD-ROM. This effort will address past problems concerning difficulty in storing and accessing SIP inventory information and providing information for Freedom Of Information Act requests.

Thanks to all who attended the meeting for making it another successful one! ✍



The CHIEF Newsletter is produced quarterly by the Emission Inventory Branch, Technical Support Division, of EPA's Office Of Air Quality Planning And Standards. Its purpose is to enhance communication within the emission factor and inventory community by providing new and useful information and by allowing for the exchange of information between and among its readers. Comments on the Newsletter and articles for inclusion in it are welcome and should be directed to Emission Factor And Inventory Group (MD-14), US EPA, Research Triangle Park, NC 27711; telephone (919) 541-5493.

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HOW BIG IS A BARREL?

Units from AP-42 "Appendix A":

An often confusing unit of measure is a barrel. A barrel's capacity is determined often by who uses the term, or what it contains. For example:

1 barrel (bbl) of petroleum or related products = 42 gallons

1 barrel of Portland cement is 375 pounds, flour-196 pounds, pork or fish-200 pounds, etc..

1 barrel of beer (US, liquid) is 31.5 (36 in Britain) gallons (more "kick" per gallon than petroleum?)

1 barrel of (US) dry measure, is 3.29122 bushels or 4.2104 cubic feet.

A barrel may be called a "drum", but a drum usually holds 55 gallons!

A barrel roll does not have weight, but is a complete "turn" in an air plane.

2 barrels (of tobacco) is equal to one hogshead, or about 1000 pounds.

Just watch the units and contents so they don't "barrel" you over! Can you think of others?

The *CHIEF Newsletter*

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