

# **Improved Point Source Inventory - Demonstration of the New Reporting Software for Consolidated Reporting of Criteria and Toxic Emissions**

Natasha Meskal  
Ecotek, MST Solutions Inc.  
8840 Warner Ave., Suite 304, Fountain Valley, CA 92708  
natasha.meskal@ecotek.com

Kyu-Kyu Remillard, Xuan Vu, Thomas Chico, and Zorik Pirveysian  
South Coast Air Quality Management District  
21865 E. Copley Drive, Diamond Bar, CA 91765

## **ABSTRACT**

Starting with the 2000-2001 reporting period, the South Coast Air Quality Management District (SCAQMD) consolidated both the Annual Emissions Inventory Report Program and the Toxic Emissions Inventory Report Program to establish a comprehensive point source emission inventory for criteria and toxic emissions. The consolidated Annual Emissions Reports (AER) filed by over 3,000 facilities provide the basis for the SCAQMD point source emissions inventory. The challenging task of consolidation was greatly facilitated by Ecotek's development and implementation of a new AER reporting software for the SCAQMD. This form-based software is discussed and presented here.

## **INTRODUCTION**

Beginning in 1995-96, the SCAQMD privatized portions of the Annual Emissions Reporting Program, which were historically implemented by the SCAQMD staff, to enhance the Program's overall efficiency, reduce costs, improve services to facilities, and enable the SCAQMD staff to conduct a more detailed engineering audit of the annual emissions reports. For the last seven years, Ecotek has been SCAQMD's consultant for the AER program. Ecotek's responsibilities include assistance with design of the reporting forms and supplemental instructions, software development, information dissemination and public assistance including internet support, information tracking and record keeping, compilation of data files relative to emissions and fees, and performing limited quality assurance (QA) and quality control (QC) of the emissions and fee data.

Historically the SCAQMD had two separate inventory programs: Annual Emission Report and Assembly Bill 2588 - state wide Air Toxic "Hot Spot" Program (AB2588). Under the Annual Emissions Report, facilities had to report their criteria pollutant emissions and 23 toxics/ozone depleters (TAC/ODC) exceeding thresholds. While reporting criteria pollutant emissions, facilities had the option to group the equipment categories as long as the activity and emission factors were identical. Emissions of 23 TAC/ODC's were reported as facility totals. AB2588 is a public right-to-know program. Facilities are asked to calculate their toxic emissions. From these emissions SCAQMD prioritizes the facilities as to their toxic risks. High-risk facilities are asked to prepare a facility-wide Health Risk Assessment (HRA). The SCAQMD has established risk levels for public notification and risk reduction. The AB2588 emission inventory requirements were very detailed; facilities were required to report the emissions at the device level. Those programs resulted in two separate databases. In order to optimize and to increase the utilization of the information collected in those distinct databases, the SCAQMD has established the following goals:

- Streamlining of the reporting process,
- Improvement of toxic emission data quality,

- Minimization of needed resources for both the facilities and the SCAQMD,
- Better positioning to meet Air Resource Board (ARB) and EPA needs, considering that those agencies are moving toward consolidation of toxic and criteria pollutant reporting,
- And, most importantly, providing a linkage and consistency between emission data for reported criteria and toxic pollutants.

As a result, starting with the 2000-01 reporting period, the SCAQMD consolidated the emissions reporting procedures under the Annual Emissions Report Program and the Assembly Bill 2588 Toxics (i.e., AB2588) Program, so as to develop an integrated emissions inventory. In order to accomplish this objective, the SCAQMD staff revised the Annual Emissions Report Program to:

- Accommodate a more detailed reporting of toxic emissions data for all facilities, and to allow additional toxic reporting under the AB2588 Program,
- Streamline the AB2588 toxic reporting and allow for emissions to be reported at the source category level

The new consolidated AER reporting software, developed by Ecotek under contract with the SCAQMD, was instrumental in providing a simplified approach for the integrated reporting of criteria and toxic emissions data. Furthermore, the new AER reporting software is user friendly, reduces errors, improves data quality and accuracy, and assists the users with the transition to the new consolidated program. Accuracy of the emissions inventory has significant implications since it is used for planning, rule development, and emission fee calculations, as well as determining the applicability of federal, state, or local programs.

The success of this user-friendly AER reporting software can be measured by the large and constantly growing number of facilities choosing software as a reporting option. In this past year, 82% of the reporting facilities used the AER reporting software. The software increased the AER program's overall efficiency both at the user and District levels.

This demonstration will illustrate the use of the new SCAQMD AER reporting software for consolidated reporting of criteria and toxic emissions.

## **SCAQMD CONSOLIDATED ANNUAL EMISSION REPORT**

### **Facilities Required to Report**

At the beginning of each reporting cycle, the SCAQMD develops a mailing list including all facilities potentially subject to the AER Program, and/or facilities required to report their quadrennial (i.e., once in 4-years) toxic emission inventory under the State of California's toxics emission reporting requirements of AB2588. Facilities potentially subject to the consolidated AER program include:

- Facilities subject to SCAQMD Rule 301(e) (<http://www.aqmd.gov/rules/html/r301.html>) which emit:
  - 1) 4 tons per year or more of any of the criteria pollutants of Volatile Organic Compound (VOC), Nitrogen Oxides (NOx), Sulfur Oxides (SOx), Particulate Matter (PM), and/or
  - 2) More than 100 tons per year of the criteria pollutant Carbon Monoxide (CO), and/or
  - 3) Any of the Toxic Air Contaminants (TACs) or Ozone Depleting Compounds (ODCs) listed in Rule 301(e) Table IV (23 toxic families including more than 67 individual compounds) exceeding specified thresholds.
- Facilities in the AB2588 Program, which are required to report all above mentioned criteria pollutants and all AB2588 toxics (71 toxic families including more than 171 individual compounds) once every four-years.

Under SCAQMD Rule 301(e), facilities subject to the AER Program are required to report their emissions and pay corresponding fees. Currently, the mailing list includes over 3,000 facilities. Although those facilities represent only about 12% of the permitted stationary source facilities in the SCAQMD, emissions attributed to these facilities represent the approximately 90% of the point source emissions.

Following the development of the mailing list, the AER reporting packages are mailed to facilities. If the facility is a first time filer, it receives instructions, reporting software and paper forms. If the facility filed electronically in the previous year, it only receives the software and the instructions.

### **AER Form Package**

The AER Program relies on a number of forms that are designed specifically for collecting emissions and fees based on the specific type of equipment, process, or industry. Currently, there is a total of 44 forms in the AER Program consisting of detailed criteria pollutant forms, detailed toxic forms, summary forms and general information forms. These forms were designed by SCAQMD staff and incorporated into the software by Ecotek. Given the number and complexity of the forms the software plays a critical role in streamlining the reporting process.

Some of the forms are designed for the more common emission source categories such as internal and external combustion equipment, coatings and solvents, fugitives and above-ground tanks while others are intended for specific industries such as refineries, power plants, body shops, and dry cleaners. Emissions calculations methodology is built-in to the forms and are generally calculated based on the fuel, material, throughput, emission factor, and control efficiency, if applicable. Step by step instructions provide guidance to the user on necessary data, common sources of data and emissions calculations. Every year, the forms and instructions are reviewed in order to reflect the latest available emission factors, calculation guidelines, and SCAQMD rules and policies, as well as to improve the forms based on the lessons learned. Table 1 provides a listing of all the forms used in the 2001-2002 AER Program.

**Table 1.** List of emissions and fee reporting forms.

<b>Form Number</b>	<b>Form Title</b>
S	Fees Due Summary
X	Signature Sheet
A	Status Update, Exemption Request, and Refund Request
ES	List of the Emission Sources
C/CU/CR	Permitted/Non-Permitted/RECLAIM Emissions Summary
TAC/TACS/TACS-O	Toxic Air Contaminants/Ozone Depleters Forms
B1/B1U	External Fuel Combustion Equipment
B2/B2U	Internal Fuel Combustion Equipment
B3/B3U	Use of Organics (Coatings and Solvents)
W/WU/WT	Credits for Waste Shipment
B4/B4U	Miscellaneous Sources
B6 to B7U	Above-Ground Storage Tanks
B8/B8U	Bulk Loading
E1/E1U	Power Generating Facilities
P1/P1U/P2/P2U	Oil/Gas Production and Chemical Plants
R1 to R7	Refineries
T1	Terminal/Depots
DC	Dry Cleaning Operations – Perchloroethylene Emissions
DCB	Dry Cleaning Operations – Boiler Emissions
AB	Auto Body Operations - Oven/Dryer Emissions

Note: U denotes non-permitted emission reporting forms.

In addition to the instructions on the back of each form, a General Instruction Booklet is provided to all facilities in the AER Program. This booklet provides program updates, general instructions, notice of the Informational Workshops or industry clinics, and available program supports (e.g., telephone hotline, one-on-one consultation), frequently asked questions, common mistakes, general tips, fee tables, and an example of how an actual report should be filed. During the last several years, specific emission calculation guidelines have also been developed or improved for a number of industries or emission categories such as internal and external combustion for a variety of fuel types, refinery fugitives and flare emissions, above-ground storage tanks, paint manufacturing, lithographic inks, liquid waste recycling credit, and spray-coating operations. The General Instruction Booklet and all emission calculation guidelines also undergo an annual review in order to incorporate the latest revisions and lessons learned.

Detailed Information about the Annual Emissions reporting format is maintained on an Internet site created by Ecotek for the SCAQMD (<http://www.ecotek.com/aqmd/>). All printed program information and software programs are available for download (<http://www.ecotek.com/aqmd/Download.htm>).

Typically, the reporting process for facilities consists of the following steps:

- Read the instructions;
- Identify the applicable forms;
- Following the step-by-step instructions of the specific form: collect fuel, material usage and throughput data, and identify the applicable emission factors;
- Complete applicable forms based on facility-specific data.

An emission source category refers to a single piece or a group of identical equipment or process (unique fuel, material, activity code, and criteria and toxic emission factors) as reported on each reference row of each detailed form. Facilities are first required to report the criteria pollutant emissions from specific source (emission source category) on the applicable criteria emission forms (starting with B, E, P, R, or T), in order to create an Emissions Source reference. The Emission Source reference consists of the form name and row number where each specific source is first reported. Using the same Emission Source reference, facilities are then required to report their toxic emissions on the applicable toxic forms (starting with T), thus linking the criteria and toxic data.

If an emitted compound is classified as both criteria and toxic, it is reported as follows:

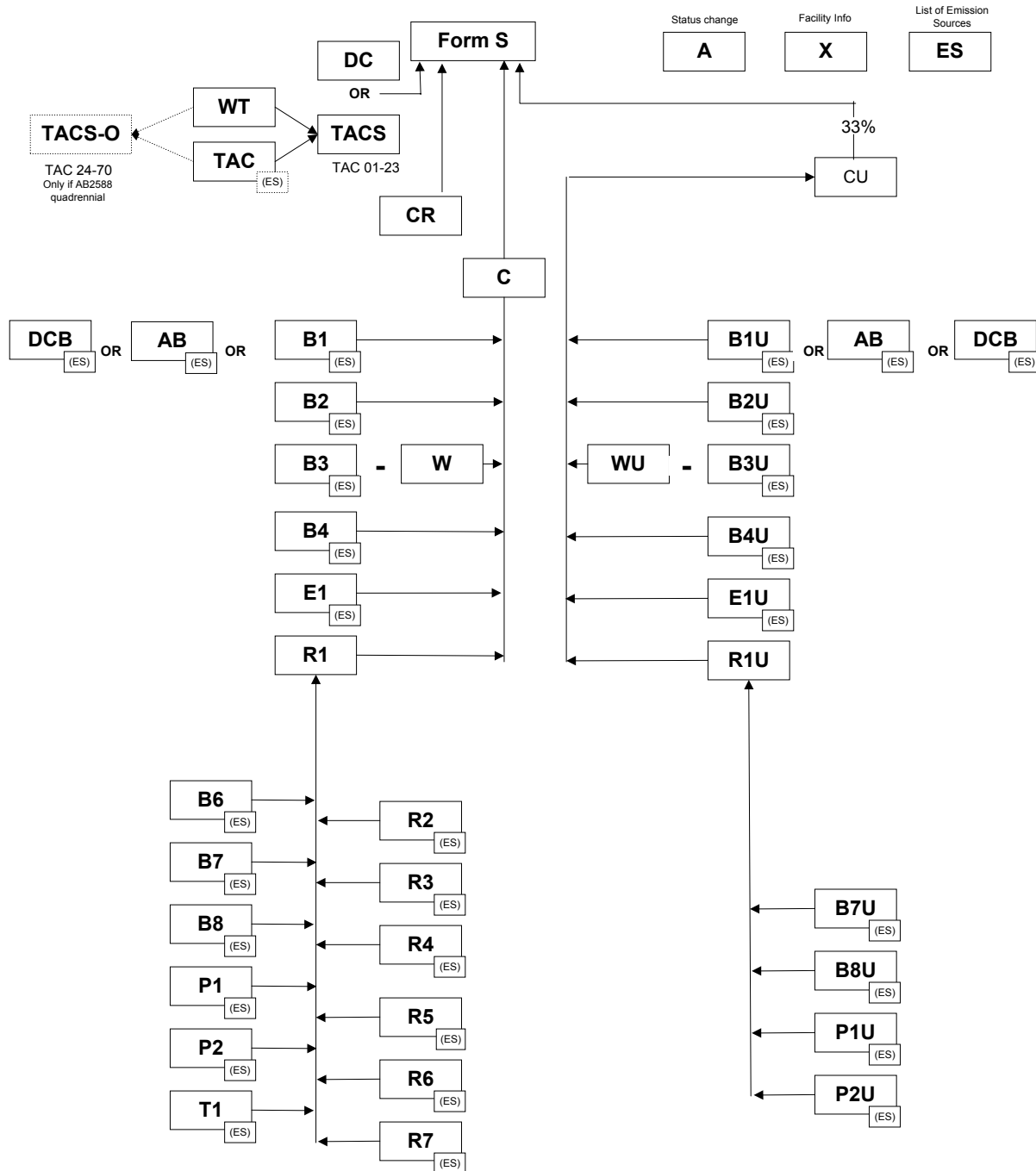
- If the emitted compound is defined as VOC and toxic it has to be reported first as VOC on the appropriate criteria emissions form, then as a toxic on form TAC.
- If the emitted compound is defined as PM and toxic, it has to be reported first as PM on the appropriate criteria emissions form, then as a toxic on form TAC.
- If the emitted compound is defined as only toxic or ozone-depleting compound, it is reported directly on form TAC.

Each toxic and ozone-depleting compound from the list is identified with a TAC Code that represents the toxic family, and a CAS# that represents the individual compound. Form TAC is a toxic calculation worksheet, where facilities are required to illustrate their calculations of toxic emissions for each emission source and speciated toxic compound (distinguished by TAC Code and each individual toxic compound identified with single CAS#) by listing the emission factor and control used in calculations. Facilities are required to list as many rows for one Emission Source Reference as necessary to report all individual toxic compounds associated with that Emission Source.

In general, the emissions from different equipment and processes calculated on detailed forms have to be transferred to the Summary Forms, such as Forms C, CU, CR, TACS, and TACS-O to determine the facility's overall emissions and corresponding emission fees, if any. Toxic emissions for Rule (301) toxic compound (TAC Code 01 to 23) have to be summarized on Form TACS, and additional AB2588 toxic compounds (TAC Code 24 to 71) have to be summarized on Form TACS-O.

Figure 1 illustrates 2001-2002 AER forms relationship.

**Figure 1.** AER Forms flow diagram.



## **Report Submission and Data Processing**

Facilities are required to file their annual emission reports, covering the fiscal year period of July 1 through June 30. Facilities must complete and submit the package to the SCAQMD by August 30. In order to help facilities file their annual emission reports, public assistance is provided through informational workshops, industry-specific clinics, one-on-one consultation and technical support such as telephone hotlines, fax, e-mail and Internet.

Facilities, using the reporting software, have three options for submitting their report: (1) on-line, via the Internet, (2) by diskette through the mail, and (3) on paper forms by mail. Facilities choosing to submit online, receive a confirmation by selecting the “submit on-line” option and simply clicking on the “Submit” button in the software program. Facilities are still required to mail a copy of the printed Fees Due Summary Form S, a Signature Sheet Form S, and Status Update, Exemption Request, and Refund Request Form A (if applicable), a check for all fees due (if any), the confirmation of their Internet submittal, and supporting documentation to SCAQMD.

Upon receipt of the reports, the data is entered into a database and data files containing detailed emissions and fees data for all facilities filing annual emission reports are generated. The QA/QC of the reported data are conducted to identify and correct any discrepancies and errors. Data files are then submitted to the SCAQMD for engineering audits.

## **THE EMISSIONS REPORTING SOFTWARE – CHARACTERISTICS AND BENEFITS**

Under SCAQMD's direction, Ecotek developed the new consolidated AER software program and Internet Services as an alternative to paper-forms reporting, achieving the following goals:

- Incorporation of new reporting requirements determined by the SCAQMD.
- User-interface and screens are kept similar to previous year's reporting software, developed by Ecotek, in order to ease the transition into the new reporting requirement.
- Increased user friendliness.

### **Software features**

The AER reporting software reduces errors, and improves data quality and accuracy. Not only does the user-friendly software facilitate emission and fee reporting for the facilities, it also makes data processing quicker, more efficient and cost-effective.

The key features of the software are contained within program modules:

- Start Screen - Contains all of the program navigation guides, and provides data file management options such as: open file, new file, save as and import last year (imports most of the last year data excluding the throughput data, and allows update rather than re-entry of the data that commonly does not change from year to year).
- Interview Module - The Interview Module collects basic information about the facility and contains a forms selection section that automatically selects required forms based on the preparer's answers to the interview questions. By selecting the facility industry type, a unique set of the questions is presented to the preparer. Since there are over 40 forms in the AER program, the form selection process is a critical step for the facilities.
- Form Selection Module - The user can fine-tune the form selection generated by the answers collected by the Interview Module.
- Form Completion Module - Pop-up labels on certain fields provide the user with hints on the information that should be entered in the field. The software performs validation checking on

entered data to ensure values conform to the requirements. All calculations are automatically performed by the software.

- Summary Module - The software transfers calculated emissions from each form to the summary forms. The summary forms provide an overview of facility-wide emissions. Fees are calculated by the software and shown on summary forms.
- Audit Module - This module provides the user a tool to evaluate the AER. In addition to the errors that have to be corrected prior to submission, the module generates warnings that highlight potential problems that should be checked but will not prevent the submission of the file. The most common warnings indicate an exceedance of specified thresholds.
- Submit Module - This module creates the Submittal file (the facility has the choice to either create a Data Disk and send it through the mail or submit the AER On-line). An audit is automatically performed before a submittal file is generated to ensure the AER submittal does not contain error conditions. The software doesn't allow the user to create a submittal unless all errors have been corrected. Problems are solved on the spot, instead of having the SCAQMD identify problems and correct them later.
- Printing Module – Prints all or selected forms and Submittal Checklist that lists commonly required supporting documentation specific to the report.
- Help Module - This module provides full on-line context sensitive help for all program features, and all step-by-step instructions to help facilities complete individual forms.

### **Software - General Benefits**

One of the main values of the software is that it guides the user and eliminates the most common mistakes illustrated in Table 2. The software was particularly helpful in conveying the new reporting requirements of the consolidated AER Program. The other is the benefit of time and resource savings, which can then be used by the SCAQMD for QA/QC or for future program improvements. Since its first introduction in 1996, the software has been continuously enhanced. In addition to the modifications that reflected SCAQMD's changes to the reporting program, the software has constantly been improved to be more user-friendly through additional features, performance improvement, more on-screen reminders, more warnings for possible problem situations and more navigational features.

**Table 2.** List of the Most Useful Software Features That Result in an Improved Data.

<b>Common Mistake or Problem</b>	<b>Software Feature</b>	<b>Benefits of Software Use</b>
<ul style="list-style-type: none"> <li>• User not computer inclined.</li> <li>• Apprehensive about using software.</li> </ul>	<ul style="list-style-type: none"> <li>• AER format provided on CD.</li> <li>• Improved Installation.</li> </ul>	<ul style="list-style-type: none"> <li>• User friendly with step-by-step instructions.</li> <li>• Installation fast, easy and simple.</li> </ul>
<ul style="list-style-type: none"> <li>• Over 40 forms to choose from, often confusing for the paper user.</li> </ul>	<ul style="list-style-type: none"> <li>• Form Selection in Interview Module.</li> </ul>	<ul style="list-style-type: none"> <li>• Forms automatically selected based on user's answers.</li> <li>• Guides the user from Start to Conclusion.</li> </ul>
<ul style="list-style-type: none"> <li>• Lengthy report preparation.</li> <li>• Don't know where to start.</li> </ul>	<ul style="list-style-type: none"> <li>• Import function.</li> </ul>	<ul style="list-style-type: none"> <li>• Allows previous year data to be simply imported /updated.</li> <li>• Provides for consistency and completeness of the reports.</li> </ul>
<ul style="list-style-type: none"> <li>• Incorrect values listed.</li> </ul>	<ul style="list-style-type: none"> <li>• Pull-down menus.</li> <li>• Build-in default emission factors.</li> </ul>	<ul style="list-style-type: none"> <li>• Provides only correct choices.</li> <li>• Directs user to enter data in the assigned format.</li> <li>• Default emission factors are automatically used by checking box.</li> </ul>
<ul style="list-style-type: none"> <li>• Wrong units, incorrect format, material reported in pounds and emission factor listed in lbs/gal, data exceeds common thresholds.</li> </ul>	<ul style="list-style-type: none"> <li>• Pop-up labels.</li> <li>• On screen reminders.</li> <li>• Build-in warnings.</li> <li>• Validation checks.</li> </ul>	<ul style="list-style-type: none"> <li>• Hints on needed information.</li> <li>• Eliminates common errors and incorrect format.</li> <li>• Directs the user.</li> <li>• Warns the user if data entered exceeds thresholds.</li> </ul>
<ul style="list-style-type: none"> <li>• Unit conversion errors.</li> </ul>	<ul style="list-style-type: none"> <li>• Unit Conversion Calculator.</li> </ul>	<ul style="list-style-type: none"> <li>• Automatically converts the commonly used units.</li> <li>• Eliminates unit conversion errors.</li> </ul>
<ul style="list-style-type: none"> <li>• Arithmetic errors.</li> <li>• Incorrect fees assigned.</li> </ul>	<ul style="list-style-type: none"> <li>• Automatic calculation of emissions and fees.</li> </ul>	<ul style="list-style-type: none"> <li>• Eliminates arithmetic errors in calculations.</li> <li>• Eliminates incorrect fees.</li> </ul>
<ul style="list-style-type: none"> <li>• Incorrect transfer.</li> </ul>	<ul style="list-style-type: none"> <li>• Automatic transfer.</li> </ul>	<ul style="list-style-type: none"> <li>• Eliminates incorrect transfer between forms.</li> <li>• Automatically creates all summary forms.</li> </ul>
<ul style="list-style-type: none"> <li>• Missing data.</li> <li>• Incomplete submittal.</li> <li>• Errors.</li> <li>• Invalid data.</li> </ul>	<ul style="list-style-type: none"> <li>• Audit.</li> <li>• Submit Module.</li> </ul>	<ul style="list-style-type: none"> <li>• Audit automatically performed. User has to correct errors prior to submitting the data.</li> <li>• Warns user of the data that exceeds the thresholds.</li> <li>• Creates submittal file and prints submittal forms.</li> </ul>
<ul style="list-style-type: none"> <li>• Uncertainty or guesswork.</li> </ul>	<ul style="list-style-type: none"> <li>• Help System.</li> </ul>	<ul style="list-style-type: none"> <li>• Provides context sensitive full online Help for all software features.</li> </ul>
<ul style="list-style-type: none"> <li>• Incomplete supporting documentation or submittal.</li> </ul>	<ul style="list-style-type: none"> <li>• Submittal Checklist.</li> </ul>	<ul style="list-style-type: none"> <li>• Based on data entered, generates checklist to assist user in verifying the completeness of the submittal including supporting documentation.</li> </ul>

### **Software - Program Consolidation Benefits**

The AER software was instrumental in providing a simplified reporting option for linking the criteria and toxic emissions data considering:

- The additional complexity resulting from the consolidation (e.g., new forms and summary forms such as Form ES),
- The need to accommodate over 171 toxic compounds required to be reported by some facilities,
- The linkage that has to be established between each emission source and multiple toxic compounds,
- The assumption that all combustion processes result in toxic emissions,
- The possibility of single combustion source resulting in emissions of up to 40 different toxic compounds,
- The number of individual entries on Form TAC at times reaching or exceeding 800.

Some of the simplified reporting options for linking the criteria and toxic emissions data offered by the software are illustrated in the following paragraphs.



As we mentioned above, combustion processes are assumed to emit toxics. Consequently, combustion sources are automatically marked as containing toxic emissions on Form ES automatically. TAC emissions for many of the combustion equipment are automatically calculated in the software using built-in default emission factors. For example, TAC emissions from a natural gas burning boiler are automatically calculated in the software once the user reports criteria emissions on Form B1/B1U. The calculations assume the most common boiler size, i.e. less than 10 MMBTU/HR. Users are urged to verify the size/type of the equipment and assigned default emission factors by the following message:

Default toxic emission factors for <10 MMBTUH equipment have been assigned on Form TAC. If your equipment reported on this row is >= to 10 MMBTUH, please update default toxic emission factors for each row associated with this emission source on Form TAC. For every associated TAC/CAS# that you have, an equipment specific emission factor, uncheck "Use Default Emission Factors" box on Form TAC and list your equipment specific emission factor.

Emission factors for one size/type of equipment can easily be updated on toxic form TAC, by simply double-clicking on any of the corresponding TAC entries and choosing different equipment size/type. Report submittal will not be accepted unless all the combustion sources also report toxic emissions. A built-in audit procedure informs the preparer about missing information via pop-up window alerts.

An emission source category refers to a single piece or a group of identical equipment or process (unique fuel, material, activity code and emission factor) as reported on each reference row of each detailed form. The reference form/row numbers are then used to report any TACs/ODCs associated with each emission source on the toxic forms. All detailed forms (excluding forms used for reporting combustion emissions which always contain TACs) include a column to help facilities identify whether or not each row of reported emissions contains any TAC or ODC. The built-in audit procedures will prevent submission of the report if Emission Source marked as containing TAC/ODC is reported without associated toxic emissions.

When viewing the Emissions Source reference pull-down menu on Form TAC, only 1) the combustion Emission Sources, 2) non-combustion Emission Sources marked as containing TAC/ODC, and 3) "Other" options are available. Each toxic and ozone-depleting compound from the list is identified with a TAC Code that represents the toxic family, and a CAS# that represents the individual compound. If "Other" reference is selected, only TAC Codes for compounds identified as only TAC/ODC are available, thus directing the facility to follow program instructions. If criteria form emission reference is selected, 23 TAC codes are available to facilities that did not mark AB2588 reporting, and 71 TAC Codes are available for selection to facilities that did mark AB2588 reporting. Once the TAC Code is selected, CAS# is automatically populated if there is only one compound in that toxic family; conversely, if the toxic family contains several compounds, only that family CAS# will be available for selection which narrows down the number of compounds and facilitates the selection process for the user. For most of the criteria form references, annual throughput and corresponding units is automatically transferred from criteria to toxic forms. If the user points the mouse on the specific reference number, associated emissions source description is displayed.

The AER software facilitates emission calculations for aboveground liquid organic storage tanks. The calculations are consistent with the U.S. EPA's TANKS Program. The software imports the results from the EPA's TANKS Program into the forms. If the preparer used speciation in EPA's TANKS program, in addition to importing VOC emissions, the software will upload associated toxic emissions as well.

All summary forms are automatically generated by the software based on completed detailed forms, including Form ES that lists all Emission Sources descriptions by Reference number (form-row) and identification as containing toxic or not.

## Software – AER Program and Point Source Inventory Benefits

Improvements to the AER program benefit both the reporting facilities and the SCAQMD. The AER software meets this ideal by providing numerous benefits. In many cases, a benefit to the reporting facilities is also a benefit to the SCAQMD. The Software improves the quality of AER submittals and therefore data accuracy of the Point Source inventory for numerous reasons:

- Data submittals are complete. Submitted data conforms to validation requirements that are programmed into the software.
- Submitted data conforms to calculation methodologies and report preparation procedures. This is in sharp contrast to the unlimited degrees of freedom available to facilities in completing paper forms.
- Data transfer mistakes are eliminated since data is automatically transferred between forms and summary forms.
- Software simplifies the report preparation and the submittal process. Emissions and fees are calculated for the facility after throughput and emission factors are entered. Uncertainty and guesswork are reduced since helpful pop-up hints and on-line help are provided.
- Software contributes to the consistency and the completeness of the reports from year to year. Software can be enhanced each year to refine features, add new features, and incorporate user feedback.
- Software reduces the time required to prepare an AER and therefore saves facilities money. This obviously benefits the facilities, but also benefits the SCAQMD. Reducing the time required to prepare the AER should also reduce the number of late filers. It is more efficient to perform batch processing according to a smooth flow process, rather than perform exception processing.
- The AER data file provides a valuable starting point for the next year AER submittal since this data can be imported and updated for the next year. This is a key benefit to facilities because after they invested the effort in the first year of their software submittal, future years are much simpler since data only needs to be updated. This can help contribute to consistency and completeness of reports from year to year.
- AER software facilitated the development of automated data processing and QA/QC screening. A data entry system was developed to collect submitted data, facilitate quality control review of submittals, and track the processing of submittals.
- AER software submittals also reduce the time and effort involved with data processing, data validation, and quality control review. A software submittal is simply uploaded from the data submittal disk. This is one of the most significant benefits of software submittals since the data entry process is eliminated. Uploading a software submittal can be done within a minute whereas the time required to process an individual paper submittal can range from less than an hour to several days or sometimes weeks.
- Simplifying the reporting process has improved the quality of the reported data thus reducing the level of effort required by SCAQMD to produce quality emissions inventories. Quality control review work is limited to evaluating certain review flags that are triggered based on SCAQMD criteria.
- The time saved as a result of improved data quality has allowed for expansion of QA/QC criteria and efforts. The QA/QC criteria have increased from 19 during the 1995-96 reporting period to 51 in the 2001-2002 reporting period.
- As a result of greater use of the reporting software, the number of problematic flags was drastically reduced.

**Table 3.** Selected flags reduction.

Flag #	Flag Description	Flags triggered in 1995-1996	Flags triggered in 2000-2001
81	Emission Factor >1 lb/lb	350	46
91	Fee Discrepancy	708	210
93	>2 Tons Discrepancy	259	50

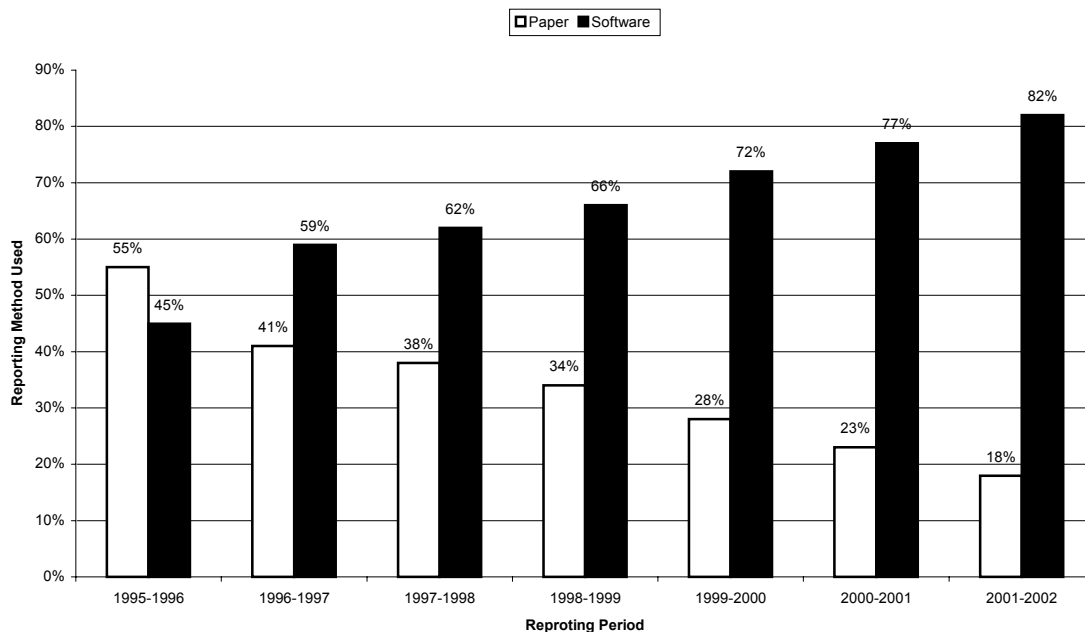
**Software – Performance and Industry Acceptance**

The software has helped the SCAQMD to improve data quality and program efficiency, and has made the reporting process significantly easier and more efficient for the facilities in the program. The acceptance by the industry is of vital importance for the software reporting performance, and thus the overall performance of the AER program since, as we mentioned earlier, greater software usage significantly contributes to improved emissions inventory data and allows more resources from Ecotek and SCAQMD to be directed toward QA/QC and auditing efforts.

In fact, the software has been greeted with enthusiasm by facilities subject to the Program, as evidenced by positive feedback received through the telephone hotline, e-mails, and other contacts. Numerous software features, on-going improvements based on facility inputs, and user-friendliness have resulted in more facilities switching from paper to software reporting. Despite added complexity due to the consolidation, the software usage did not decrease. The success of this user friendly AER reporting software can be measured by the large and constantly growing number of facilities choosing software as a reporting option. In this past year, 82% of the reporting facilities used the AER reporting software. Fig. 2 illustrates the steady increase in software use by facilities.

It is worth noting that software usage has been consistently higher among the facilities emitting 10 tons or more of criteria pollutants. For this group of facilities, the percent of software users has increased from 57% in 1995-1996 to 89% in the 2001-2002 reporting period.

**Figure 2.** Percentage of Overall Reporting Method Used



## CONCLUSION

Merging and Streamlining of both programs, historical AER and AB2588 through this consolidation effort has resulted in an improved, optimized and integrated emission inventory.

The overall efficiency of the consolidated Annual Emission Reporting Program was greatly improved through reporting software and automated data processing and auditing procedures. The new AER reporting software reduces errors, improves the data quality and accuracy, and assists the users with the transition to the new consolidated program. The new user-friendly AER reporting software was instrumental in providing a simplified reporting option for linking and integrating the criteria and toxic emissions data.

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## KEY WORDS

Point Source Emission Inventory, Criteria Emissions, Toxic Emissions, Consolidated Criteria and Toxic Reporting, Software Reporting, Data management

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