FY 2002-3 QUALITY ASSURANCE PROJECT PLAN (QAPP)

Missouri Department of Natural Resources
Air and Land Protection Division
Air Pollution Control Program

EMISSION INVENTORY: ANNUAL AND PERIODIC

Responsibility (Project Code): QAEIQ

Responsible Agency: MDNR / ALPD / APCP

Project Officer: T. Calvin Ku

Project Officer Signature:

APPROVAL:

4/3/02

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3/26/02

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A2. TABLE OF CONTENTS

A. PROJECT MANAGEMENT

A1. Title and Approval Sheet 1
A2. Table of Contents 2
A3. Distribution List 3
A4. Project/Task Organization
A4.1. Purpose/Background 4
A4.2. Key Program Personnel/Areas of Responsibility 5
A6. Project/Task Description
A6.1 Purpose/Background 8
A6.2 Description of Work to be Performed 10
A7. Quality Objectives and Criteria for Measurement Data 11
A8. Special Training Requirements/Certification 12
A9. Documentation and Records
A9.1. Purpose. 12
A9.2. Information Included in the Reporting Packages. 13
A9.3. References. 13

B. MEASURMENT/DATA ACQUISITION

B5. Quality Control Requirements 16
B9. Data Acquisition Requirements (Non-Direct Measures) 16

C. ASSESSMENT AND OVERSIGHT

C1. Assessment and Response Actions 18
C2. Reports to Management 19

D. DATA VALIDATION AND USABILITY 20

APPENDICES

A. Consolidated Emissions Reporting Rule (CERR) Summary (from Section A4.1) 22
B. Emission Inventory Data Flow Chart (from Section A4.2) 24
C. Organizational Charts (from Section A4.2) 26
D. Emission Inventory Questionnaire (from Section A6.1) ..... Attached
E. Structure of Missouri Emission Inventory System (MOEIS) (from Section A6.1) 29
F. CERR Data Elements and Corresponding NIF V. 3.0 Data Elements (from Section A6.1) 31
G. Area Source Categories Inventoried Statewide for the PEI (from Section A6.1) 38
H. Non-reactive Volatile Organic Compounds not to be included as VOC (from Section B5) 39

A3. DISTRIBUTION LIST

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Calvin Ku, Chief	*Technical Support Section (TSS), APCP, ALPD, MDNR*
Cheryl Hickman, Unit Chief	*Emission Inventory Unit (EIU), TSS, APCP, ALPD, MDNR*
Emission Inventory Unit Staff	
Alicia Weaver, MoEIS Project Manager	*Tier Technologies*

A4. PROJECT/TASK ORGANIZATION

A4.1 Purpose/Background

The Clean Air Act Amendments (CAAA) of 1990 specified the requirements for states to inventory emissions contributing to the National Ambient Air Quality Standards (NAAQS). The CAAA established nonattainment area classifications and inventory requirements according to the severity of the area's air pollution problem. A base year inventory was established in 1990, with the requirement that emissions be tracked to ensure control strategies are being implemented to reduce emissions and move areas toward attainment. Annual and periodic emission inventories are reportable to EPA as per 40 CFR 51.321.

Modifications set forth in the Consolidated Emissions Reporting Rule (CERR), summarized in Appendix A, are designed to improve reporting efficiency, provide flexibility, and better explain to program managers and the public the need for a consistent inventory program. Annual inventories on specific sources, and a comprehensive periodic inventory on a three-year cycle, will form a cohesive record of emissions and information to assess the effect of control strategies for emission reduction.

A major project was initiated in 1999 to design the new Missouri Emission Inventory System (MoEIS), consisting of a database structure and software, data entry, and information access and retrieval capabilities. A workgroup comprised of APCP staff representing the Technical Support, Permitting, Administration, and Enforcement Sections, provided the system's content and capability requirements. These were implemented by a team of computer system design specialists from Tier Technologies, assisted by staff from the Program Analysis and Technical Support Sections of Management Information Services (MIS) in the Division of Administrative Support (DAS). MoEIS is designed to be accessible on the web, and became available for industry to submit their Emission Inventory Questionnaires (EIQs) on line in January of 2003.

Data is provided to EPA's National Emission Trends database using the new National Emission Inventory (NEI) Input Format Version 2.0. Point and area source criteria pollutant data was provided in June, 2001 to the EPA via the Central Data Exchange per the Emission Factor and Inventory Group's instructions on the Air CHIEF website.

Applications for the use of emission inventories are extensive. Emission inventory data are a basic component of air pollution assessment, and the development of air quality improvement and maintenance strategies. Uses of emission inventories include:

- State oversight of point sources
- Public information web sites and requests
- The EPA National Emission Inventory (NEI) trends reports
- Emission trading
- Attainment demonstrations
- Emission fees assessments
- Used to develop new methodologies and techniques to estimate emissions (emission factors)
- Document regulatory impact assessments
- Permitting
- Air quality assessments
- Human exposure modeling

A4.2 Key Program Personnel / Areas of Responsibility

All Personnel are in the Emission Inventory Unit (EIU) unless indicated otherwise:

Emission Inventory Unit Chief:	Cheryl Hickman, EIU, TSS, APCP, ALPD, MDNR
MoEIS Leaders:	Randy Raymond, MoEIS Project Sponsor, Permitting Chief Alicia Weaver, MoEIS Project Manager, Tier Technologies Thomas Adams, Environmental Specialist III
Local Agency Data/ MoEIS Conversion:	Bridget Hillman, MIS, MDNR
EIQ Mailout:	Thomas Adams, Environmental Specialist III Terry Stock, Research Analyst II
EIQ Receipt and Distribution:	Carolyn Kliethermes, Admin, APCP, ALPD, MDNR Tim Largent, Admin, APCP, ALPD, MDNR Brenda Aronhalt, Admin, APCP, ALPD, MDNR Thomas Adams, Environmental Specialist III

Point Source Facility Consultation, Information Requests, EIQ Review, Data Validation & Entry Into MoEIS, Coordination with Local Agencies and Regional Offices:

Thomas Adams, Research Analyst III
Jeanne Brown, Office Support Assistant
Carlton Flowers, Environmental Engineer II
Nathan Holm, Research Analyst II
Jerry Howard, Research Analyst III
Zak Rabei, Environmental Specialist III
Terry Stock, Research Analyst II
Patricia Tighe, Research Analyst I
Jill Wade, Environmental Engineer II

Route Calls, Refund Letters, Data Entry:	Brenda Wansing, Clerical Supervisor Marsha Schenewerk, Clerical Support

Annual and Periodic Point Source Emission Inventory NET Format:

Nathan Holm, Research Analyst II

Periodic Emission Inventory Development:

Area Sources:	Mollie Freebairn, Chemist III
	Jill Wade, Environmental Engineer II
Onroad Mobile Sources:	Carlton Flowers, Environmental Engineer II
Nonroad Mobile Sources:	Carlton Flowers, Environmental Engineer II
Biogenic Sources:	Carlton Flowers, Environmental Engineer II
QAPP Preparation:	Mollie Freebairn, Chemist III
Overall QA:	John Madras, ALPD Administration, MDNR
Overall Project Coordination:	T. Calvin Ku, TSS, APCP, ALPD, MDNR

Data Flow Chart, Organizational Charts, and SIC Codes

See the Data Flow Chart in Appendix B.

Organizational Flow Charts are located in Appendix C for:

1) Emission Inventory Operations,
2) MoEIS Development Team – Division of Administrative Support (DAS) Staff, and
3) MoEIS Development Team – APCP Staff.

The areas of expertise of EIQ personnel with respect to Standard Industrial Classification (SIC) codes is shown on the next page.

Point Source Specialties According to Standard Industrial Classification (SIC) Code:

SIC Code	Major Group	Responsible Personnel
Agriculture, forestry, and fishing 0001, 0002, 0007	Agricultural Production	Terry Stock
Metal Mining 1011 - 1499	Coal Mining Mining & quarrying of nonmetallic minerals, except fuels	Patricia Tighe, Jill Wade, Jerry Howard, Nathan Holm, Thomas Adams, Terry Stock, Carlton Flowers, Zak Rabei
Manufacturing 2011 - 3999	Establishments engaged in mechanical or chemical transformation of materials or substances into new products.	Patricia Tighe, Jill Wade, Jerry Howard, Nathan Holm, Terry Stock, Thomas Adams, Carlton Flowers, Zak Rabei
Transportation, Communications, Electric, Gas, and Sanitary Services		
4612 - 4619	Pipelines, except natural gas	Nathan Holm, Zak Rabei, Thomas Adams
4911 & 4953	Electric & Landfills	Jill Wade, Carlton Flowers, Terry Stock, Thomas Adams, Jerry Howard, Nathan Holm
Wholesale Trade		
5012 - 5099	Wholesale Trade - Durable Goods	Nathan Holm, Jill Wade, Zak Rabei, Carlton Flowers, Thomas Adams
5153 - 5159	Farm-Products, Raw Materials	Terry Stock, Thomas Adams, Nathan Holm
5171 - 5172	Petroleum & Petroleum Products	Zak Rabei, Nathan Holm, Terry Stock, Thomas Adams
5191 – 5199	Miscellaneous Nondurable Goods	Thomas Adams, Terry Stock, Zak Rabei, Jerry Howard, Nathan Holm
Personal Services		
7219	Dry Cleaning	Terry Stock
7261	Funeral Service & Crematories	Jerry Howard, Nathan Holm, Thomas Adams, Zak Rabei
Health Services 8011 – 8099	Hospital Incinerators	Jerry Howard, Carlton Flowers, Thomas Adams, Zak Rabei, Nathan Holm
Educational Services 8211 - 8299	Incinerators	Jerry Howard, Thomas Adams, Nathan Holm, Jill Wade
Public Administration 9223 – 9229	Correctional Institution Incinerators	Terry Stock, Nathan Holm
9711	National Security	Jill Wade, Carlton Flowers

A6. PROJECT/TASK DESCRIPTION

A6.1 Purpose/Background

Air emission inventories have been developed and compiled in Missouri by the Department of Natural Resources since the passage of the Clean Air Act in 1970. The improvement of emission data collection techniques and data quality continues to be an evolving process. As required by the CAAA of 1990, the Air Pollution Control Program (APCP) / Technical Support Section (TSS) / Emission Inventory Unit (EIU) conducts an annual inventory to document air emissions, set permit requirements, and provide information to the public and the EPA. **Missouri 10 CSR 10-6.110 Submission of Emission Data, Emission Fees and Process Information** requires facilities emitting over a set amount of each air pollutant to submit an Emission Inventory Questionnaire (EIQ) reporting all of their annual emissions by April 1st of each year.

Annual and Periodic Emission Inventories are reportable to EPA as specified in the Consolidated Emissions Reporting Rule (CERR). A summary of CERR reporting requirements is shown in Appendix A. Annual reporting is limited to a subset of major point source emissions, while a more extensive Periodic Emission Inventory (PEI) encompassing the entire point source domain, as well as area, onroad, nonroad, and biogenic sources is prepared every three years (for 1990, 1993, 1996, 1999, 2002, etc.). The PEI is submitted to the EPA for incorporation into the National Emission Inventory (NEI). Criteria pollutants are inventoried for all source categories. Air toxics are currently inventoried for point sources only on a statewide basis. An air toxics inventory of point, area, and onroad mobile sources was conducted for the St. Louis Community Air Project (CAP) for 1996, 1999, and 2001.

A6.1-1 Point Source Annual and 3-Year Periodic Emission Inventory (PEI)

The EIU collects annual point source emission data via a process in which Emission Inventory Questionnaires (EIQs) are submitted by all major point sources. These point sources have operating permits classified as Basic, Intermediate, or Part 70. The list of sources to be inventoried is compiled from the database of EIQ reporting facilities, state permit holders, and additional and new facilities in Missouri supplied by the regional offices and local agencies. EIQ forms and instructions (attached as Appendix D) are available on the Internet at http://www.dnr.state.mo.us/alpd/apcp/EIQforms.htm. Standard operating procedures for compiling the point source inventories are given in the Emissions Inventory Questionnaire (EIQ) Procedures Manual, given in the References in Section A9.3.

As the EIQs are received, APCP Administration personnel set aside fees and forward the documentation to the EIU for review and analysis. The EIU initially reviews all incoming EIQs for completeness, and if complete they are routed to the specialist in charge of that type of facility. The specialist or engineer reviews the EIQ and enters the information in a three step process: 1) EIQ tracking to check and enter the general plant information and total plant emissions, 2) Data entry to review and enter the remaining detailed information, and 3) Verification, which is a complete analysis of the accuracy of the emission point layout and

calculations. This final step is performed for sources receiving refunds for overpayments, requests for additional fees, and others as considered necessary by the EIU staff. Facilities with EIQs not returned by April are contacted, and if they do not respond they are referred to the APCP Enforcement Section for action.

Once staff approves the accuracy of data reported in the EIQs, the data is entered into the Missouri Emissions Inventory System (MoEIS). A brief description of the MoEIS project, and an outline of the MoEIS data structure is provided in Appendix E. When all inventory information is complete, the NEI Format Computer Specialist extracts the data from the inventory database into the current NEI Version 3.0 format for the annual or 3-year periodic information to be submitted to the EPA. The structure of MoEIS data is designed to facilitate point source NEI submittals to the EPA.

A6.1-2 Area, On- and Nonroad Mobile, and Biogenic 3-Year Periodic Emission Inventories

Missouri's Periodic Emission Inventory (PEI) for point, area, nonroad, onroad, and biogenic sources is prepared every three years and submitted to the EPA for incorporation into the National Emission Inventory (NEI). After the PEI for a given source category is complete, data is compiled for EPA in NEI Input Format Version 3.0 by the EIU specialist conducting the inventory and/or the NET Format specialist. Tables of the data elements to be included in the NEI Submittal, showing the correspondence between the NIF 3.0 and the CERR data elements, are described in section A7 and given in Appendix F.

Area Sources: Required statewide for criteria pollutants for the PEI / NEI. The EIU specialist will develop a list of area sources based on the 1999 NEI. Area source categories will be ranked according to expected total emissions from largest category to smallest, identifying the highest-emitting area source categories. Missouri is collaborating with the Lake Michigan Air Directors Consortium / Midwest Regional Planning Organization (LADCO/Midwest RPO) on a review of EPA guidance, emission factors, and activity data, and developing a consensus on the best methodology for each source category. This will result in the most accurate and comparable emission estimates. The method of emissions calculation will be selected, using the same methodology as LADCO/Midwest RPO when appropriate. Ammonia methodology will use the CMU Ammonia Model. Area source activity data needed for each category will be collected using parameters specific to Missouri counties. Calculations will then be compiled and entered in the area source calculation spreadsheets. The resulting emissions data will be converted into NEI Version 3.0 format for EPA submittal, running available edit checks, and correcting any errors found. Area source categories to be evaluated are listed in Appendix G.

On-Road Mobile Sources: Required statewide for criteria pollutants for the PEI / NEI. On-road mobile emissions are prepared using EPA's MOBILE6 model to produce emission factors. The local travel-demand model prepared by East-West Gateway Coordinating Council (EWGCC) and the Federal Highway Administration's (FHWA) Highway Performance Monitoring System (FPMS) data may be used to estimate Vehicle Miles Traveled (VMT) throughout Missouri. The MOBILE6.2 model is used to estimate particulate and particle-bound HAP emissions.

Non-Road Mobile Sources: Required statewide for criteria pollutants for the PEI / NEI. Non-road emissions are prepared for various categories of small engines and aircraft, locomotives, and marine engines. Emissions are prepared using EPA's NONROAD model. Aircraft, locomotive, and marine emissions are prepared in accordance with methodology in EPA's Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources.

Biogenics: Required statewide for criteria pollutants for the PEI / NEI. Biogenic emissions are prepared using the EPA Biogenic Emission Inventory System (BEIS3).

Air Toxic Inventories: The first comprehensive air toxic emission inventory in Missouri was conducted for point, area, and onroad mobile sources for the St. Louis Community Air Project (CAP) for 1996 and 1999. The EIQ has included Form 2.T for facilities to report their toxics emissions for a number of years, but only uncontrolled emissions were called for, thus hampering an inventory of controlled, actual emissions. The 2002 EIQ Form 2.T has been revised to improve facilities' reporting of HAP emissions, and to include HAP control efficiencies and actual HAP emissions. Statewide HAP emissions for point sources for 2002 will therefore be submitted. If feasible, the development of HAP emission inventories for area, onroad, and nonroad mobile sources, based on the PEI criteria pollutant submittal, will also be carried out. This would take place following June 1, 2004, and would be submitted if and when a second phase of state submittals takes place.

A6.2 Description of the Work to be Performed

1) **Measurements Expected:** EIQs will provide annual actual point source emissions. Area, mobile, and biogenic emissions will be estimated using current methodologies and models.

2) **Applicable Technical Quality Standards or Criteria:** Guidance as provided by EPA. Section A9.3 provides a list of references.

3) **Special Personnel and Equipment Requirements:** Staff performing data review and analysis are professional engineers or have sufficient education/experience to perform emission calculations and work with models. The state has the computer equipment necessary to handle stationary point and area source data via MoEIS and various software and to run the CMU Ammonia, MOBILE, NONROAD, and BEIS models.

4) **Assessment Techniques:** The following activities will be utilized for review of data:
   - EIQ review
   - Guidance as provided by EPA
   - Detection and elimination of data entry errors
   - Verification of emission estimate calculations
   - Consultation within EIU and others
   - Comparison of like industries
   - Comparison of EIQ toToxic Release Inventory (TRI) emissions data
   - Comparison of permit allowables to EIQ reported emissions
   - On-sire audit of selected EIQs

5) Schedule of Work:

ANNUAL /PERIODIC POINT SOURCE EMISSION INVENTORY

INVENTORY WORK TO BE PERFORMED	DATE TO BE COMPLETED
Preparation of EIQs	August – November, 2002
EIQ Mailout	January 2, 2003
Receipt of EIQs	April 1, 2003
Initial Review, Tracking, & Data Entry into MoEIS	January – June, 2003
Verification of EIQs	March – December, 2003
Compilation of data in NEI Format	January – May, 2003
Electronic Submittal to EPA:	
2001 Inventory Report in NEI Version 3.0 format/	
Category A Sources	June 1, 2003;
Category B Sources	June 1, 2004

PERIODIC AREA, ON- & NONROAD MOBILE, & BIOGENIC INVENTORIES

INVENTORY WORK TO BE PERFORMED	DATE TO BE COMPLETED
Preparation of Area, On- & Nonroad Mobile, & Biogenic Source Inventory for 2002 PEI	February 2004
Complete draft 2002 inventory	March 1, 2004
Complete internal QA/QC	April 1, 2004
Format data into NIF 3.0	April 15, 2004
Run EPA QA/QC software on first draft	May 1, 2004
Correct all errors identified by QA/QC software	June 1, 2004
Submit data through CDX	June 1, 2004
Submit audit report to EPA Region 7 office	July 15, 2004

6) Project and Quality Records Required:

- Completed EIQs on file in APCP file room
- Documentation of other data bases used for information on file in APCP Emission InventoryUnit (EIU)
- Emission report to EPA Region 7 on file in APCP EIU
- Correspondence with sources and EPA on file in APCP file room and Technical Support Section (TSS)
- PEI Audit Report to EPA Region 7 to be kept on file in APCP EIU

A7. QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

One goal of the QAPP is to make certain the inventory submitted to the NEI contains all of the required data elements. However, the mandatory fields in the NEI Input Format Version 3.0 do not have a direct correspondence to the required CERR elements. Tables of the data elements in CERR showing the corresponding the NIF 3.0 data elements for point, area and nonroad, onroad mobile, and biogenics are given in Appendix F.

A8. SPECIAL TRAINING REQUIREMENTS/CERTIFICATION

Staff responsible for emission inventory analysis and review have the requisite degrees, work experience, personal attributes, and training requirements appropriate for their positions. Emission Inventory Unit staff position descriptions and records on personnel qualifications and training are maintained in the Human Resources Office and are accessible for review during audit activities.

The APCP includes in its staff budget an amount for individual staff training each year. Each staff member has a training plan in his/her performance appraisal planning document. Training is aimed at increasing the knowledge and proficiency of employees and the Emission Inventory Unit. Appropriate training is available to all employees commensurate with their duties. Training includes on-the-job training, classroom lectures, workshops, and teleconferences, provided by State, Local, and EPA Partnerships, such as the EPA Emission Inventory Improvement Program (EIIP), East-West Gateway Coordinating Council (EWGCC), and the Air & Waste Management Association (AWMA). Participation in the St. Louis Community Air Project (CAP), EIIP committees, Environmental Council of States (ECOS), Central States Air Resource Agencies (CenSARA), Central Regional Air Planning Association (CenRAP), and industry groups such as the AWMA, American Petroleum Institute (API), and other groups contributes to the quality and accuracy of emission inventories. The APCP provides training for the regional and local agency staff and makes presentations at Region 7 training activities when requested.

A9. DOCUMENTATION AND RECORDS

A9.1 Purpose

As the process of emission inventory reporting covers a wide span of time, there are segments of the fiscal year where multiple years of inventory are being dealt with. Record maintenance thus requires a file room with clearly distinguished files by inventory year. EIQs, correspondence, and other supporting information will remain on file indefinitely. PEIs to include annual information will also remain on file indefinitely. Records to be maintained are:

- EIQs
- Completed checklists as provided by EPA
- Documentation of emission estimates
- Documentation of model calculations
- Documentation of information from other data systems
- QA/QC reports
- Electronic files of inventory submission
- Emission reports to EPA Region 7
- Audit report to EPA Region 7

A9.2 Information Included in the Reporting Packages

Electronic Submission to EPA: Air emission inventory data files will be electronically transmitted through the EPA's Central Data Exchange facility to the Emission Factor and Inventory Group (EFIG) as instructed on the CDX Data Submittal Procedures web site at http://www.epa.gov/ttn/chief/nif/cdx.html.

Region VII Emission Report: Periodic Emission Inventory time frame, geographic area covered by the inventory, pollutants and source categories addressed in the inventory, summary of methods used in inventory preparation, summary of data used in emission calculations, explanations of assumptions used, outline of demographic data used, data references, sample survey, completed EPA checklist, any other graphs or information pertinent to the inventory.

Region VII Audit Report: The audit report will serve dual purposes. The first will be to document the results of the QA/QC procedures. Secondly, it is envisioned that this document should be used to document and justify the quantitative differences between the current inventory and the previous periodic inventory. By doing so, this will help users of the inventory distinguish between actual emissions reductions and those perceived reductions that are a result of new calculation methods or models.

A9.3 References

1. Emission Inventory Questionnaire (EIQ) forms and instructions: http://www.dnr.state.mo.us/alpd/apcp/EIQforms.htm (attached as Appendix D).

2. *Emissions Inventory Questionnaire (EIQ) Procedures Manual*, Missouri Department of Natural Resources, Air Pollution Control Program, prepared by Emission Inventory Unit staff in 1996, with more recent updates. Available in the Emission Inventory Unit (EIU) of the Technical Support Section (TSS), Air Pollution Control Program (APCP), Air & Land Protection Division (ALPD), Missouri Department of Natural Resources, PO Box 176, 205 Jefferson St., Jefferson City, MO 65102. (573) 751-4817.

3. *1996 Base Year Ozone Periodic Emissions Inventory for Ozone Precursors and Carbon Monoxide for St. Louis Nonattainment Areas*, Nguyen, K., Missouri Department of Natural Resources, Air Pollution Control Program, May 1999.

4. *Periodic Emissions Inventory for 1996 / St. Louis Metropolitan Area*, East-West Gateway Coordinating Council, January 12, 1999.

5. Draft *St. Louis Community Air Project (CAP) Toxics Emission Inventory,* Freebairn, M., Boussad, M., Flowers, C., Missouri Department of Natural Resources, Air Pollution Control Program, September, 2001.

6. EPA CHIEF Bulletin Board: http://www.epa.gov/ttn/chief

7. EPA NET Data Submission Information: http://www.epa.gov/ttn/chief/ei/eisubmit.html

8. EPA *Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter-National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations*, EPA-454/R99-0006, April 1999.

9. EPA *Handbook for Criteria Pollutant Inventory Development: A Beginner's Guide for Point and Area Sources*, EPA-454/R-99-037, September 1999.

10. Emission Inventory Improvement Program, Volume I, *Introduction and Use of EIIP Guidance for Emissions Inventory Developmen*t, EPA-454/R-09-004a, July 1997.

11. Emission Inventory Improvement Program, Volume II, *Point Sources Preferred and Alternative Methods*, EPA-454/R-97-004b, July 1997.

12. Emission Inventory Improvement Program, Volume III, Area Sources.

13. Emission Inventory Improvement Program, Volume IV, *Mobile Sources*, EPA-450/4-81-026d (Revised).

14. Emission Inventory Improvement Program, Volume V, *Biogenic Sources Preferred Method*, May 1996.

15. Emission Inventory Improvement Program, Volume VI, *Quality Assurance Procedures.*

16. Emission Inventory Improvement Program, Volume VII, *Data Management Procedures.*

17. Emission Inventory Improvement Program EIIP-Phase 2; *Future Directions for the Millennium.*

18. EPA January 1995 *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Fifth Edition and Supplements A-F, AP-42.

19. *Documentation for the 1996 Base Year National Toxics Inventory for Area Sources*, Eastern Research Group, June, 2000.

20. Documentation for the 1996 Base Year National Toxics Inventory for Nonroad Vehicle and Equipment Sources, Eastern Research Group, June, 2000.

21. Documentation for the 1996 Base Year National Toxics Inventory for Commercial Marine Vessel and Locomotive Mobile Sources, Eastern Research Group, June, 2000.

22. *Documentation for the 1996 Base Year National Toxics Inventory for Onroad Sources*, Eastern Research Group, June, 2000.

23. Vehicle & Engine Emission Modeling Software: http://www.epa.gov/otaq/models.htm

24. Data Attribute Rating System (DARS) Scores.

25. EPA Quality Review Guidelines for 1990 Base Year Emission Inventories; EPA-454/R-92-007; August 1992.

26. EPA Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors *of Ozone*, Volume 1, EPA-454/4-91-016; May 1991.

27. EPA August 1997 *Guidance for Quality Assurance Project Plans*, EPA QA/G-5 Final.

B. MEASUREMENT/DATA ACQUISITION

B.5 QUALITY CONTROL REQUIREMENTS

1. All emission calculations shall be traceable to continuous emission monitoring (CEM), stack tests, mass balance, AP-42, FIRE, or other source reporting or state estimation methods.
2. All addresses shall be physical addresses without PO boxes, source names shall include the corporate name and site.
3. Guidance provided by EPA shall be used whenever possible to document the steps taken to review and qualify the data provided by source, test, or emissions estimation method.
4. Verification of EIQ data is conducted on about 20% of all EIQs as described in Section A6.1-1 Point Source Annual and 3-Year Periodic Emission Inventory (PEI). Facilities that owe additional money or are due refunds must be verified. In addition, Part 70 and intermediate sources are verified preferentially. EIQs found to have errors upon data entry are flagged for verification. If errors are found following the NEI submittal, Region VII will be notified and the corrections will be forwarded for inclusion in the NEI.
5. EIQ Audits are conducted at the facility by EIU staff together with regional or local inspectors in a small number (>1%) of total EIQ submissions. These may be conducted when facility EIQ emission factors do not correspond to the actual processes at the plant. There are no emission factors in AP-42 or FIRE for many industrial processes, particularly for PM2.5, NH3, and HAPs. The best method for obtaining more accurate emission factors is determined by reviewing the EIQ with the facility, and touring the plant. A report is sent to the company detailing the improvements to be made for the next year's EIQ submittal.
6. All coordinates will be verified for accuracy through either GPS devices or through comparisons to other media reporting for consistency.
7. Rule Effectiveness and Rule Penetration are incorporated where applicable.
8. Base Year Inventory data will be compared. Changes in emissions exceeding normal growth factors will be isolated for review.

9. The non-reactive volatile organic compounds listed in Appendix H. will not be included as VOC (list found in 40 CFR 51.100).

B.9 DATA ACQUISITION REQUIREMENTS (NONDIRECT MEASUREMENTS)

Outside sources of information (other data bases, models, source lists) and the data used from each:

National Emission Inventory (NEI) database: Criteria and hazardous air pollutant (HAP) emissions.

MOBILE6 model: Onroad emissions.

NONROAD model: Offroad emissions.

Federal Highway Administration Highway Performance Monitoring System / Annual Report of Highway Statistics: Gasoline consumption, stage 2 breathing losses / vehicle miles traveled (VMT) data.

Missouri Department of Agriculture / Fuel Quality Program - Estimated annual gallons of gasoline used in Missouri counties (in lieu of nonexistent state gasoline sales tax records): Tank fill method, breathing losses; VOC and HAP emissions.

U.S. Census Bureau: Area source per capita activity data.

Dunn and Bradstreet Reports: Compilation of inventory sources, number of employees for factors, identification of area source categories.

Toxic Release Inventory data: Compilation of major HAP point source toxic emissions.

State and county highway departments: Traffic paint usage values, lane miles painted.

Aviation: Fuel usage reports/aircraft refueling, landings and takoffs (LTOs).

RCRA source lists: Identify all municipal waste landfills.

US Forest Service, Missouri Department of Conservation, and Missouri Department of Natural Resources / Division of State Parks: Wildfire statistics, prescribed burning.

US Bureau of Alcohol, Tobacco and Firearms: Production data for breweries, wineries, and distilleries.

Accidental Release Reports from other media at the Department.

Labor Department: Employment statistics for emission factors.

C. ASSESSMENT/OVERSIGHT

C1. ASSESSMENTS AND RESPONSE ACTIONS

- Assessments will be held for each major phase of the inventory process. An internal program tracking emissions inventory questionnaires (EIQs) and monies will be completed one month after all questionnaires are due to the State. All questionnaires will be reviewed for completeness and proper receipt. Checks may include: emission comparison of like sources, a review of source-supplied emission factors compared to those of AP-42, FIRE, stack tests, or engineering calculations when the reviewer finds the information of questionable value, and verification of data used in models. Of particular importance are the estimation of emissions and the documentation of calculations. Accuracy and consistency will be checked. Outcomes of the assessments will be forwarded to the Emission Inventory Unit Chief for approval of corrective actions.

- Reviews will be held on certain industrial codes for verification of complex emission estimation calculations. After designated staff complete the original review of source questionnaires, questionable portions of the questionnaire may be reviewed and discussed by other team members. Industrial sources targeted for reviews include electric generation, chemical manufacturers, lead industries, and major manufacturing VOC sources.

- As EIQ data is entered into the state data system, MoEIS recalculates the total plant emissions based upon the facility's detailed emission information. The principal method by which data entry errors are detected, is by comparing the total plant emissions reported by the facility to those calculated by MoEIS. For each facility there is a view in MoEIS, the "Site EIQ Tracking Summary", which displays "Actual Emissions Reported" side by side with a "Calculated Summary of Form 2.0". This feature serves as a check for any errors in data entry, as well as calculation errors on the part of the facility. Both types of errors are indicated by a discrepancy between the two emissions summaries, which can then be tracked down and corrected.

- The APCP will request that EPA Region VII review and recommend revisions to the Emission Inventory Quality Assurance Project Plan (EI QAPP) prior to final approval of the plan.

- Data is compiled into the format required by EPA data submittals. Formatted data is then checked for completeness and accuracy.

- GPS Coordinate Review: The APCP has conducted careful GPS measurements of every facility in the state. These GPS coordinates are in MoEIS, and are considered to be the most accurate to date, so if a facility submits conflicting coordinates they are not entered. Future corrections will take place as part of a MoEIS expansion into water and land releases.

- A comparison is made of allowable emissions stated in source permits to the actual emissions reported by the source. The state data system should have the ability to maintain both records in order to report discrepancies.

- Other audits and QA/QC activities as appropriate.

Air Toxic / HAP Emissions Reporting:

- Beginning with the 2002 EIQs, facilities are now asked to report both uncontrolled and controlled HAPs emissions on the revised Form 2.T in addition to reporting them as VOCs or PM10. Also reported are HAPs that are not VOCs or PM10, including hydrochloric acid (HCl), hydrofluoric acid (HF), semi-volatile organic compounds (SVOCs), 2,3,7,8-tetrachlorodibenzo-p-dioxin, mercury, and mercury compounds.

- In a detailed comparison of EIQ and Toxic Release Inventory (TRI) point source air toxic emissions that was conducted for the St. Louis Community Air Project (CAP), it was found that the list of toxic chemicals required to be reported, the handling and/or emission reporting thresholds, and other reporting requirements substantially differ. In order for EIQ emissions to agree with TRI emissions, differences between their reporting requirements need to be reconciled or otherwise taken into account.

C2. REPORTS TO MANAGEMENT

All audit reports as defined in Section D shall be forwarded to the Project Manager, and then to the Air Pollution Control Program Director for review and recommendations for corrective actions. If an audit report uncovers a significant quality assurance problem, the Emission Inventory Unit Chief is responsible for ensuring recommended solutions be completed via a corrective action plan.

D. DATA VALIDATION AND USABILITY

D1. QUALITY ASSURANCE AND QUALITY CONTROL

The following sections discuss the QA/QC measures taken during the data collection and analysis phases of the emissions inventory.

Internal Reviews

Internal reviews consist of in-house procedures performed by the Emission Inventory Unit (EIU).

Data Collection Procedures

The point source data collection is accomplished through the mailing of emission inventory questionnaires (EIQs) to individual facilities. A computerized log system was set up in MoEIS to track the return of all EIQ forms. Appendix D. contains copies of the EIQ forms.

The information reported in the EIQs is coded and entered into MoEIS. The research analyst, environmental specialist, or engineer responsible for entering data for a facility has their USERID also logged into the computerized system. They are responsible for the gathering of any missing information from the facilities via follow-up phone calls or letters. MoEIS performs emission calculations to double-check all necessary information for accuracy and reasonableness.

Data Integrity

All point source records for all facilities are stored in MoEIS. The system uses look-up tables, drop-down list boxes, and edit checks to insure data consistency and quality. MoEIS provides the department with the ability to reduce the reporting burden of our regulated community, reduce data entry, and improve data integrity.

Data Checks

Data is checked in the MoEIS system using FOCUS reports. FOCUS reports were developed as part of the MoEIS design, to be a versatile tool for retrieving any kind of needed information contained in MoEIS. In addition, FOCUS enables the user to display this information in any desired report format. For example, reports can be generated ranking the largest sources of a given pollutant in Missouri, or any selected counties, such as for plotting on a map. Reports can be based on SICs or SCCs, to obtain a list of medical waste incinerators, or coal-burning boilers. FOCUS reports can be made showing trends – e.g., the top 20 pollutants for last tens years. Name and address reports are generated of facilities for example according to permit type, type of source, top emitters, or those out of business. Missing data and duplicate records can be readily located. Using FOCUS a variety of data checks can be constructed to serve the purpose at hand.

External Review / EPA Comment

A review of the Missouri emissions data to be used in the National Emissions Inventory (NEI) is performed by EPA every three years, most recently in August 2001. Comments and corrections are forwarded to each state for their review and revisions.

D2. DATA VALIDATION REPORTS

Data quality objectives shall be reviewed and validated by Emission Inventory Unit staff as assigned using the following schedule:

Site Audits: Ongoing

Peer Reviews: Ongoing

Technical Assessment Audit (TAA): Date of request letter to EPA – March 31, 2002

EPA Audit: Every three years

Questionnaire to State Data System Check: Ongoing

TRI Audit: See Section C1. Air Toxic / HAP Emissions Reporting

MoEIS Data to NEI Check: Annual reporting requirements – June 1

VOC Pollutant Review: Ongoing

Base Inventory Comparison: Every five years

Permit Allowables to Actual Emissions Comparison: Ongoing

Other Audits and Activities (Site, EPA, etc.) as Deemed Appropriate: Ongoing

Appendix A.

Summary of Major Provisions for the
Consolidated Emissions Reporting Rule (CERR)
The final rule is given in the *Federal Register:*
June 10, 2002, Volume 67, Number 111, Pages 39602-39616.

This brief summary is provided as a quick introduction to the CERR and covers the major items in the rule. Interested parties are strongly encouraged to read the promulgated rule to understand all of its details. The final rule is available on the CHIEF website (http://www.epa.gov/ttn/chief/cerr/index.html)

The purpose of the CERR is to simplify reporting, offer options for data collection and exchange, and unify reporting dates for various categories of criteria pollutant emission inventories. The rule applies to State and local agencies. Previous reporting requirements have, at times, forced reporting agencies into inefficient collecting and reporting activities. This rule consolidates the emission inventory reporting requirements found in various parts of the Clean Air Act (CAA). Consolidation of reporting requirements will enable State and local agencies to better explain to program managers and the public the necessity for a consistent inventory program, increases the efficiency of the emission inventory program, and provide more consistent and uniform data.

The first emissions reportable under the CERR are annual point source emissions for the year 2001 and are due June 1, 2003. We have significantly reduced the number of point sources that are required to be reported annually, so this requirement should reduce the reporting agencies workload. States will be required to prepare a comprehensive Statewide inventory every three years. The first three year inventory will be for the year 2002 and will be due June 1, 2004.

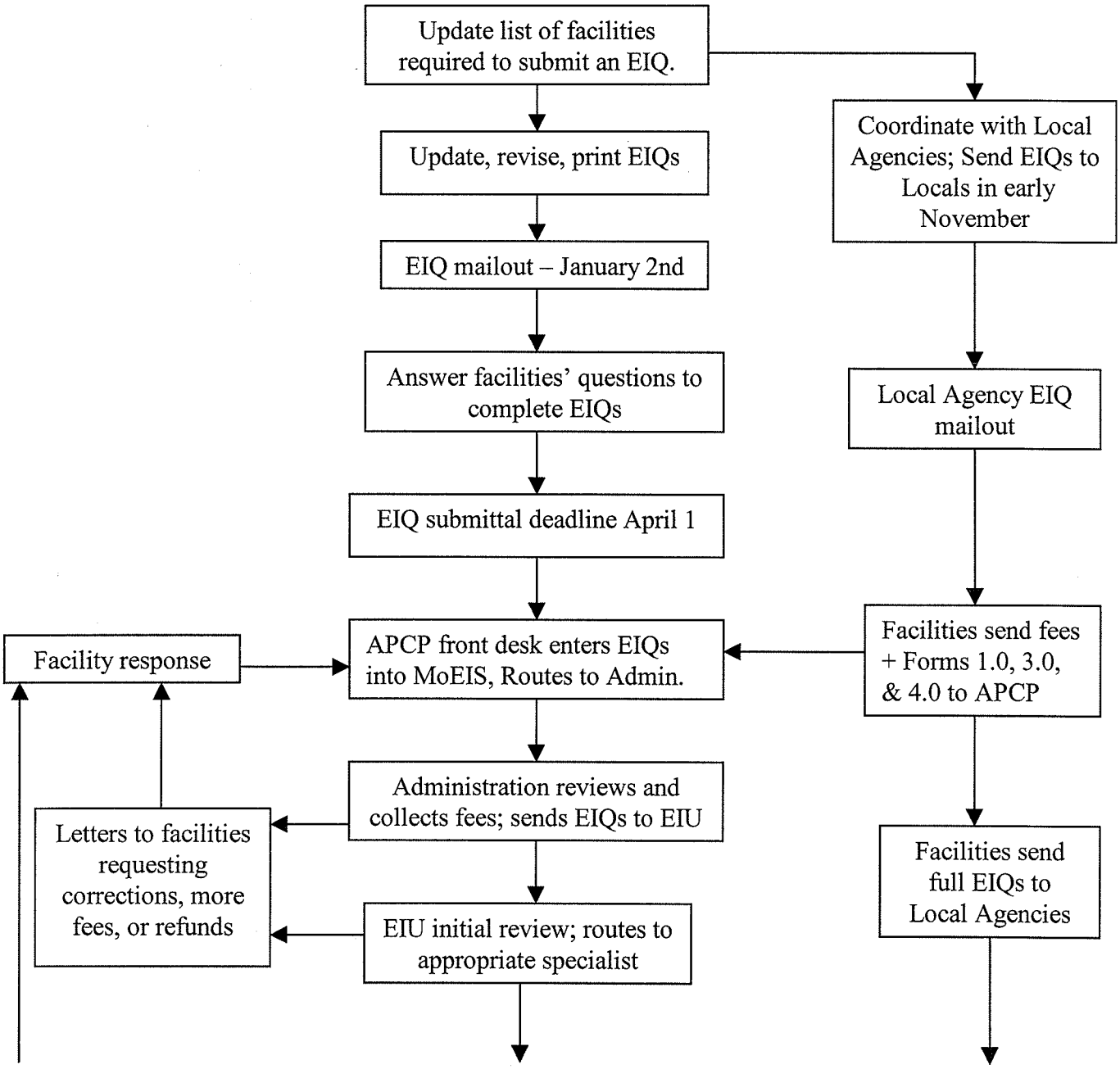
The following table presents a summary of the major provisions in the CERR and shows the differences before the CERR and after.

Consolidated Emissions Reporting Rule (CERR) Major Provisions

PROVISION	BEFORE CERR	CERR
Pollutants Reported	SO_x, VOC, NO_x, CO, Pb, PM_{10}	SO_x, VOC, NO_x, CO, Pb, PM_{10}, $PM_{2.5}$*, NH_3*
Sources/Geographic Area	Point Sources - National Area, Onroad Mobile, Nonroad Mobile Biogenic-Nonattainment Areas Only	Point, Area, Onroad Mobile, Nonroad Mobile, Biogenics – National
Point Source Threshold	One set of thresholds for national reporting, different thresholds for Nonattainment Areas	Two sets of thresholds for national reporting (large sources and smaller sources), different thresholds for Nonattainment Areas
Reporting Frequency		
Point Sources	Annual for All	Large Point Sources - Annual Small Point Sources – Triennial
Area, Onroad Mobile, Nonroad Mobile, Biogenics	If required, Triennial	Triennial

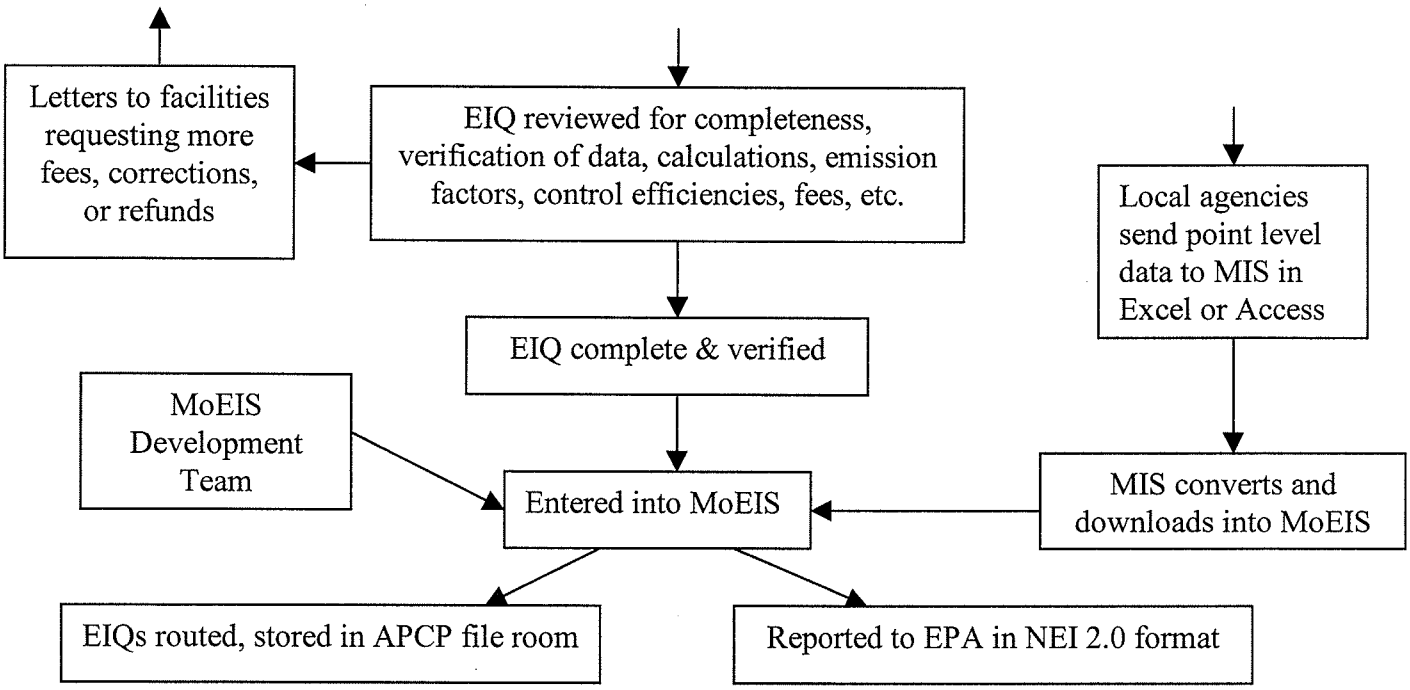
Appendix B.

EMISSION INVENTORY DATA FLOW CHART
(from Section A4.2)



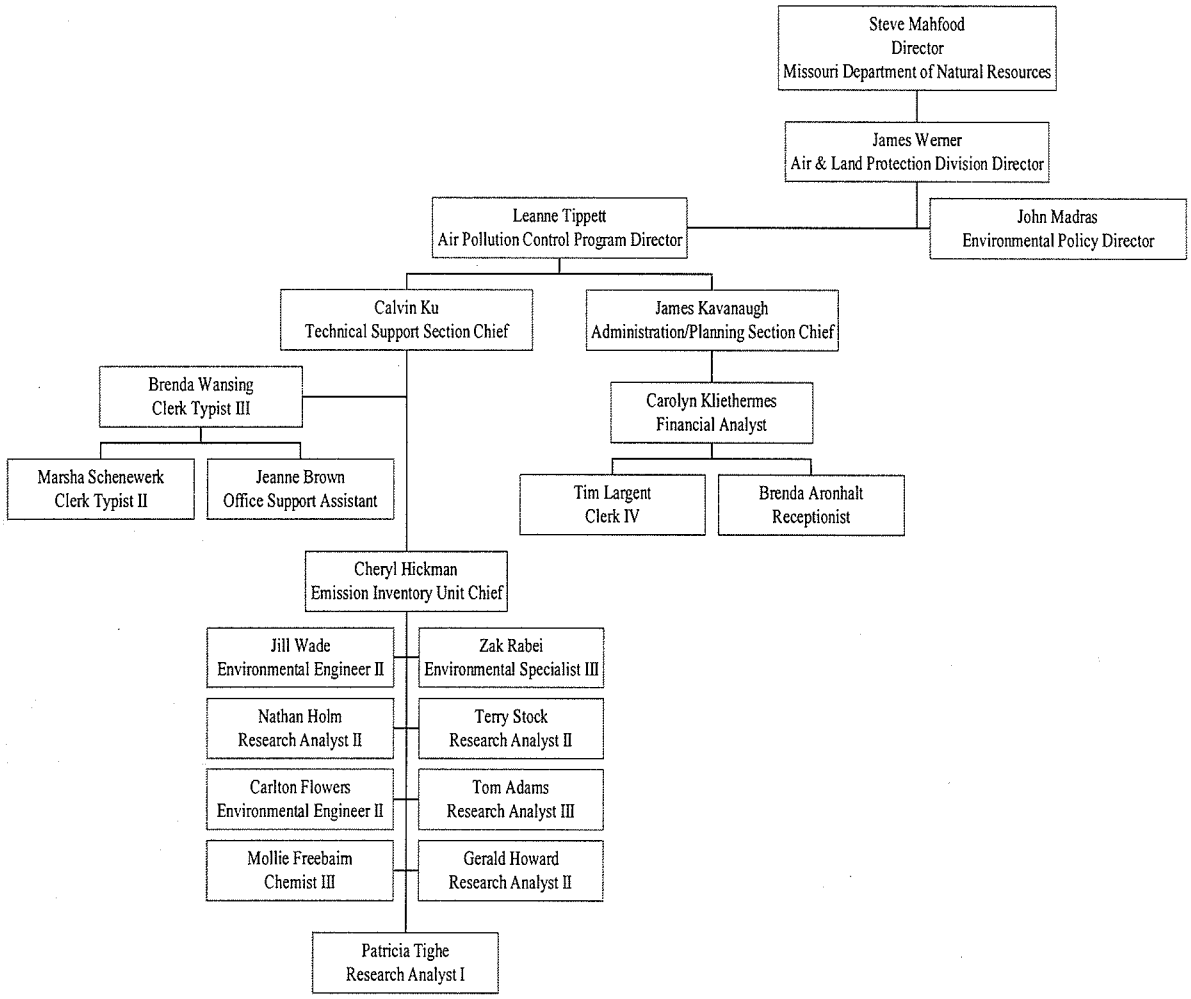
Appendix B.

EMISSION INVENTORY DATA FLOW CHART
(Continued)



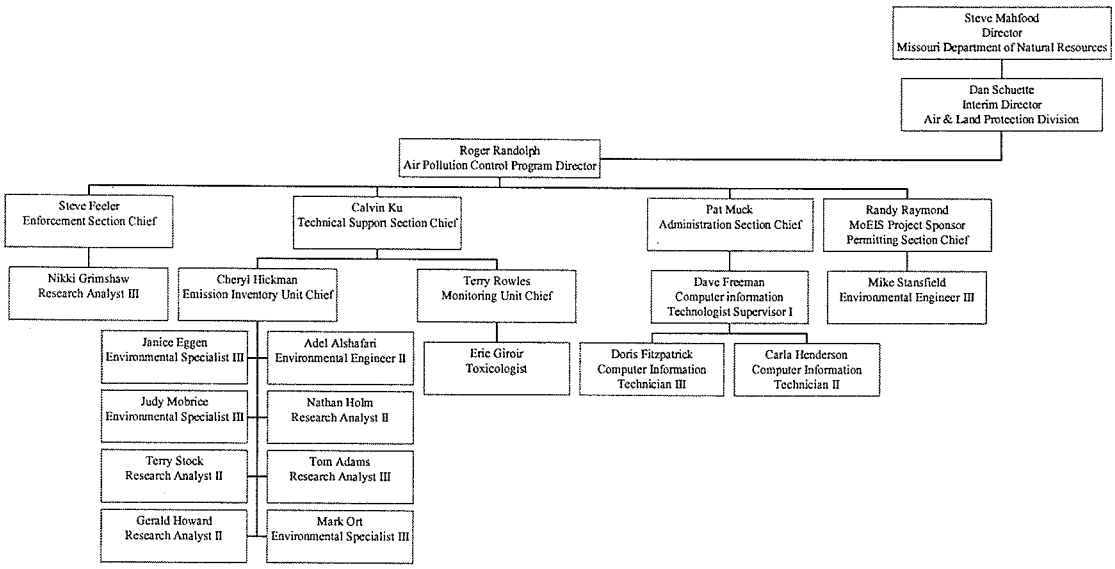
Appendix C.
EMISSION INVENTORY ORGANIZATIONAL CHART

EMISSION INVENTORY OPERATIONS

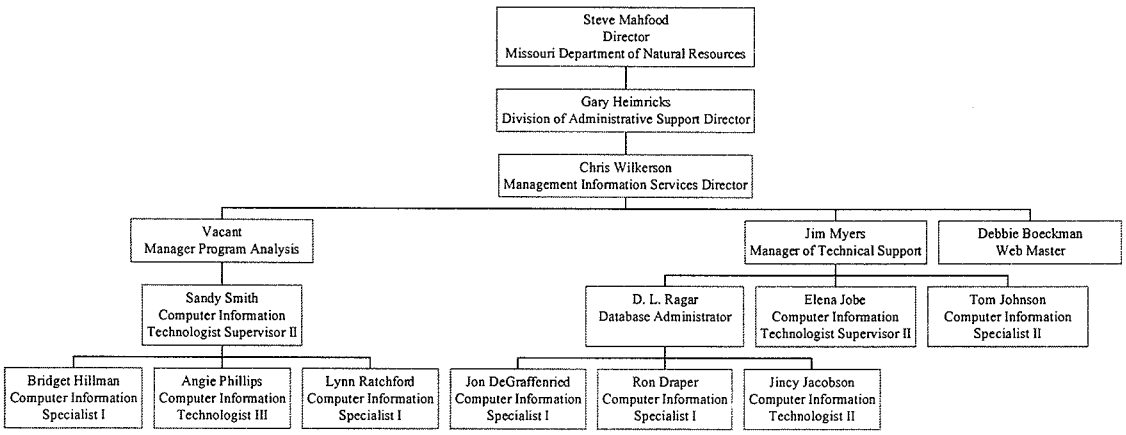


MoEIS DEVELOPMENT TEAM
circa 1999 - 2001

APCP Staff



Division of Administrative Support (DAS) Staff



Appendix D.

EMISSION INVENTORY QUESTIONNAIRE (from Section A6.1)

See attached yellow packet

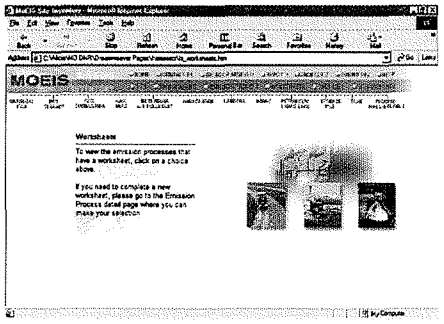
Appendix E.

STRUCTURE OF MISSOURI EMISSION INVENTORY SYSTEM (MOEIS) DATADASE (from Section A6.1)

See next page

Missouri Department of Natural Resources,
Air Pollution Control Program

Regulated Community Reports Air Pollution Emissions On-line



Project: Missouri's Emission Inventory System (MoEIS)

Project Objective: Develop a client/server application and develop a transaction based G2B portal.

Description: Tier Technologies and the Missouri Department of Natural Resources (DNR) are ensuring the State efficiently and accurately collects air pollution emissions inventory data and fees by phasing in a system that will eventually take full advantage of Internet technology.

During MoEIS Phase 1, Tier and the Missouri Department of Natural Resources worked closely with the DNR staff using a Rapid Application Prototyping approach to analyze, design, develop and implement MoEIS as an integrated emissions inventory program. MoEIS combines four legacy systems, which were disjointed, poorly documented, difficult to maintain, and not Y2K compliant into one client/server application. The MoEIS data structure combines the data from over 7,000 legacy Paradox tables and Access databases into one common database.

During MoEIS 2000, Tier and the Missouri Department of Natural Resources continued to expand on the client/server functionality established during Phase I. As part of the MoEIS 2000 project, the DNR and Tier Technologies conducted an extensive evaluation of three web development tools. The evaluation was conducted to select a web development tool capable of supporting the DNR's web application needs--both static and transactional. Tier provide technical expertise to lead the evaluation process and help the DNR adopt a strategic Web architecture.

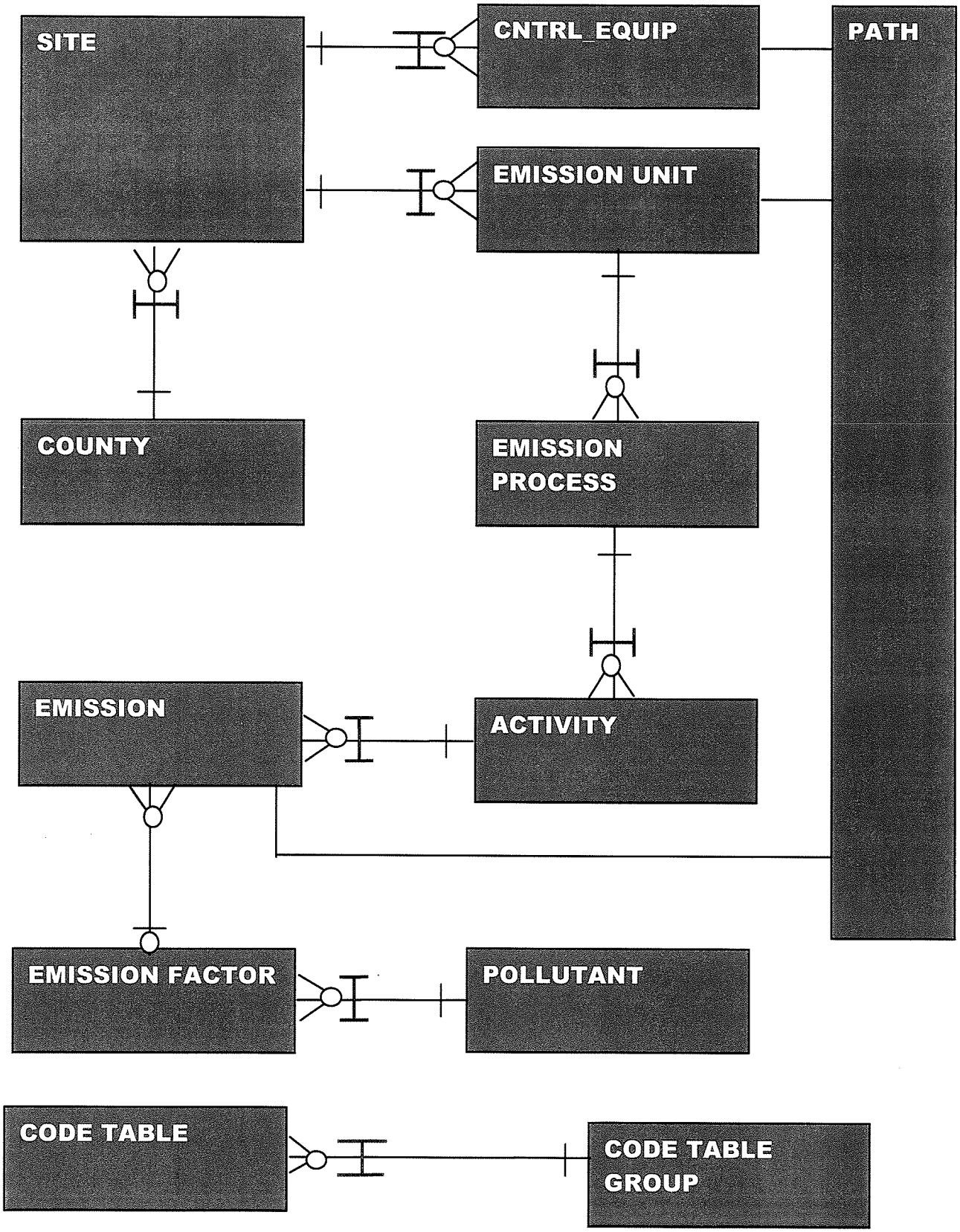
During MoEIS 2001, Tier and the Missouri Department of Natural Resources are working with the DNR staff to develop a web portal for the regulated community to electronically submit Emissions Inventory Questionnaires (EIQ). The system will be used by the regulated community and regulators to report and track air pollution emissions and fees. MoEIS was originally intended as the foundation for future application development in the Air Pollution Control Program (APCP). Due to the success of the project, MoEIS is quickly becoming the foundation for future application development for the DNR.

Benefits:

The e-government and G2B transactions will make the emissions inventory process more efficient and will reduce the reporting burden on the regulated community. This can mean significant timesavings for large companies. Electronic submittal also reduces entry errors and improves data integrity. The Air Pollution Control Program (APCP), local agencies, regional offices, and the regulated community will all benefit from the web portal, while the DNR benefits from its preparation for future e-government expansion.

Tier
Expect A Lot

MoEIS High Level Entity Relationship Diagram Snippet



Appendix F.

CERR Data Elements and Corresponding Data Elements in NIF Version 3.0

From: 40 CFR 51 Appendix A Table 2A

Point Sources:

CERR Data Element	NIFV3.0 Data Element(s)	NIF V3.0 Record(s)
1.Inventory year	Inventory Year	
2.Inventory start date 3.Inventory end date	Start Date, End Date	PE, EM
4.Inventory type	Inventory Type Code	TR
5.State FIPS code	State and County FIPS Code	All recs
6.County FIPS code	State and County FIPS Code	All recs
7.Facility ID Code	State Facility Identifier	SI, EU, EP, CE, ER, PE, EM
8.Point ID code	Emission Unit ID	EU, EP, CE, PE, EM
9.Process ID code	Process ID	EP, CE, PE, EM
10.Stack ID code	Emission Release Point ID	ER, EP, EM
11.Site name	Facility Name	SI
12.Physical address	Location Address, City, State, Zip Code	SI
13.SCC or PCC	SCC	EP
14.Heat content (fuel) (annual average)	Heat Content	EP
15.Ash content (fuel)(annual average)	Ash Content	EP
16.Sulfur content (fuel)(annual average)	Sulfur Content	EP
17.Pollutant code	Pollutant Code	CE, EM
18.Activity/throughput (annual)	Actual Throughput Throughput Unit Numerator Material, Material I/O Start Date, End Date	PE PE, EM

CERR Data Elements and Corresponding Data Elements in NIF Version 3.0
From: 40 CFR 51 Appendix A Table 2A

Point Sources:

CERR Data Element *	NIFV3.0 Data Element(s)	NIF V3.0 Record(s)
19.Activity/throughput (daily)	Actual Throughput Throughput Unit Numerator Material, Material I/O Start Date, End Date	PE PE, EM
20.Work weekday emissions	Emission Numeric Value Emission Unit Numerator Start Date, End Date Emission Type	EM PE, EM EM
21.Annual emissions	Emission Numeric Value Emission Unit Numerator Start Date, End Date Emission Type	EM PE, EM EM
22.Emission factor	Factor Numeric Value Factor Unit Numerator Factor Unit Denominator Material, Material I/O	EM
23.Winter throughput(%) 24.Spring throughput(%) 25.Summer throughput(%) 26.Fall throughput(%)	Winter Throughput PCT Spring Throughput PCT Summer Throughput PCT Fall Throughput PCT	EP
27.Hr/day in operation	Annual Avg Hours Per Day; or Period Hours Per Day	EP PE
28.Start time (hour)	Start Time	PE, EM
29.Day/wk in operation	Annual Avg Days Per Week; or Period Days Per Week	EP PE
30.Wk/yr in operation	Annual Avg Weeks Per Year; or Period Weeks Per Period	EP PE

CERR Data Elements and Corresponding Data Elements in NIF Version 3.0
From: 40 CFR 51 Appendix A Table 2A

Point Sources:

CERR Data Element *	NIFV3.0 Data Element(s)	NIF V3.0 Record(s)
31.X stack coordinate (latitude) 32.Y stack coordinate (longitude)	X Coordinate, Y Coordinate, UTM Zone, XY Coordinate Type Horizontal Collection Method Code, Horizontal Accuracy Measure, Horizontal Reference Datum Code, Reference Point Code, Source Map Scale Number	ER
33.Stack Height 34.Stack diameter 35.Exit gas temperature 36.Exit gas velocity 37.Exit gas flow rate	Stack Height Stack Diameter Exit Gas Temperature Exit Gas Velocity Exit Gas Flow Rate	ER
38.SIC/NAICS	SIC Primary, NAICS Primary SIC Unit Level, NAICS Unit Level	SI EU
39.Design capacity 40.Maximum nameplate capacity	Design Capacity Design Capacity Unit Numerator Design Capacity Unit Denominator Max Nameplate Capacity	EU
41.Primary control eff(%) 42.Secondary control eff (%) 43.Control device type	Primary PCT Control Efficiency PCT Capture Efficiency Total Capture Control Efficiency Primary Device Type Code Secondary Device Type Code	CE
44.Rule effectiveness (%)	Rule Effectiveness Rule Effectiveness Method	EM

CERR Data Elements and Corresponding Data Elements in NIF Version 3.0
From: 40 CFR 51 Appendix A Table 2A

Area and Nonroad Mobile Sources:

CERR Data Element *	NIFV3.0 Data Element(s)	NIF V3.0 Record(s)
1.Inventory year	Inventory Year	TR
2.Inventory start date 3.Inventory end date	Start Date, End Date	PE, EM
4.Inventory type	Inventory Type Code	TR
5.State FIPS code	State and County FIPS Code	All recs
6.County FIPS code	State and County FIPS Code	All recs
7.SCC or PCC	SCC	EP, PE, CE, EM
8.Emission factor	Factor Numeric Value Factor Unit Numerator Factor Unit Denominator Material, Material I/O	EM
9.Activity/throughput level (annual)	Actual Throughput Throughput Unit Numerator Material, Material I/O Start Date, End Date	PE
10.Total capture/control efficiency (%)	Primary Pct Control Efficiency Pct Capture Efficiency Total Capture Control Efficiency Primary Device Type Code	CE
11.Rule effectiveness (%)	Rule Effectiveness Rule Effectiveness Method	EM
12.Rule penetration (%)	Rule Penetration	EM
13.Pollutant code	Pollutant Code	CE, EM

CERR Data Elements and Corresponding Data Elements in NIF Version 3.0
From: 40 CFR 51 Appendix A Table 2A

Area and Nonroad Mobile Sources:

CERR Data Element *	**NIFV3.0 Data Element(s)**	**NIF V3.0 Record(s)**
14. Summer/winter work weekday emissions	Emission Numeric Value, Emission Unit Numerator Start Date, End Date Emission Type	EM PE, EM EM
15.Annual emissions	Emission Numeric Value, Emission Unit Numerator Start Date, End Date Emission Type	EM PE, EM EM
16.Winter throughput (%) 17.Spring throughput (%) 18.Summer throughput (%) 19.Fall throughput (%)	Winter Throughput PCT Spring Throughput PCT Summer Throughput PCT Fall Throughput PCT	EP
20.Hrs/day in operation	Annual Avg Hours Per Day; or Period Hours Per Day	EP PE
21.Days/wk in operation	Annual Avg Days Per Week; or Period Days Per Week	EP PE
22.Wks/yr in operation	Annual Avg Weeks Per Year; or Period Weeks Per Period	EP PE

CERR Data Elements and Corresponding Data Elements in NIF Version 3.0
From: 40 CFR 51 Appendix A Table 2A

Onroad Mobile Sources:

CERR Data Element *	**NIFV3.0 Data Element(s)**	**NIF V3.0 Record(s)**
1.Inventory year	Inventory Year	TR
2.Inventory start date 3.Inventory end date	Start Date, End Date	PE, EM
4.Inventory type	Inventory Type Code	TR
5.State FIPS code	State and County FIPS Code	All recs
6.County FIPS code 7.SCC or PCC	State and County FIPS Code SCC	All recs PE, EM
8.Emission factor	**	**
9.Activity (VMT by Roadway Class)	Actual Throughput Throughput Unit Numerator Start Date, End Date	PE
10.Pollutant code	Pollutant Code	EM
11.Summer/winter work weekday emissions	Emission Numeric Value, Emission Unit Numerator Start Date, End Date	EM PE, EM
	Emission Type	EM
12.Annual emissions	Emission Numeric Value, ** Emission Unit Numerator Start Date, End Date	EM PE, EM
	Emission Type	EM

** Transmit emission factor information via MOBILE model input files.

CERR Data Elements and Corresponding Data Elements in NIF Version 3.0
From: 40 CFR 51 Appendix A Table 2A

Biogenic Sources:

CERR Data Element *	**NIFV3.0 Data Element(s)**	**NIF V3.0 Record(s)**
1.Inventory year	Inventory Year	TR
2.Inventory start date 3.Inventory end date	Start Date, End Date	EM
4.Inventory type	Inventory Type Code	TR
5.State FIPS code	State and County FIPS Code	All recs
6.County FIPS code	State and County FIPS Code	All recs
7.SCC or PCC	SCC	EM
8. Pollutant code	Pollutant Code	EM
9.Summer/winter work weekday emissions	Emission Numeric Value, Emission Unit Numerator Start Date, End Date Emission Type	EM
10.Annual emissions	Emission Numeric Value, Emission Unit Numerator Start Date, End Date Emission Type	EM

All code tables and descriptions can be found on the Emission Inventory web site, address http://www.epa.gov/ttn/chief/nif/index.html.

Appendix G.

Area Source Categories Inventoried Statewide for the Periodic Emission Inventory (PEI)

Tank Truck Unloading	Small Industrial Fuel Combustion
Vehicle Refueling	Structure Fires
Tank Trucks in Transit	Slash/Prescribed Burning
Underground Storage Tank Breathing	Forest Fires
Aircraft Refueling	Bakeries
Petroleum Vessel Loading/Unloading	Breweries
Architectural Coatings	Wineries
Industrial Surface Coatings	Distilleries
Auto Refinishing	Catastrophic/Accidental Releases
Traffic Markings	Open Burning
Solvent Cleaning Operations	Land Clearing Waste Burning
Dry Cleaning Coin Operated	Yard Waste Burning
Dry Cleaning Commercial/Industrial	Residential Wood Combustion
Graphic Arts	Agricultural Burning
Cutback & Emulsified Asphalt	Orchard Heaters
Consumer-Commercial Solvent Use	SOCMI Tanks
Municipal Waste Landfills	Barge, Tank , Tank Truck,
Wastewater Treatment at POTWs	Rail Car, and Drum Cleaning
and Package Plants	On-site Incineration
Industrial Wastewater Treatment	Charcoal Grilling
and TSDFs	Firefighter Training
Pesticide Application	Vehicle Fires
Residential and Commercial/	
Institutional Fuel Combustion	

Appendix H.

NON-REACTIVE VOLATILE ORGANIC COMPOUNDS NOT TO BE INCLUDED AS VOC (from Section B5)

The following non-reactive volatile organic compounds will not be included as VOC (list found in 40 CFR 51.100):

Methane; Ethane; Methylene chloride; Methyl chloroform; CFC-113; CFC-11; CFC-12; HCFC-22; HFC-23; CFC-114; CFC-115; HCFC-123; HFC-134a; HCFC-141b; HCFC-142b; HCFC-124; HFC-125; HFC-134; HFC-143a; HFC-152a; PCBTF; Cyclic, Branched, or Linear Completely Methylated Siloxanes; Acetone; Tetrachloroethylene;	HCFC-225ca; HCFC-225cb; HFC 43-10mee; HFC-32; HFC-161; HFC-236fa; HFC-245ca; HFC-245ea; HFC-245eb; HFC-245fa; HFC-236ea; HFC-365mfc; HCFC-31; HCFC-151a; HCFC-123a; PFC: Cyclic, branched or linear, completely fluorinated alkanes; PFC: Cyclic, branched or linear, completely fluorinated ethers with no unsaturations; PFC: Cyclic, branched or linear, completely fluorinated tertiary amines with no unsaturations; PFC: Sulfur-containing perflorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine