

**REQUEST FOR PROPOSAL**

**WESTERN GOVERNORS' ASSOCIATION  
WESTERN REGIONAL AIR PARTNERSHIP (WRAP)**

**Design and Implementation of an  
Emissions Data Management System**

September 30, 2003

**INVITATION TO BID**

DATE: September 30, 2003  
BID NO: 03WGA127WRAP  
DIRECT INQUIRIES TO: Richard Halvey  
PHONE NO: (303) 623-9378

RETURN BID TO: Western Governor's Association  
1515 Cleveland Place, Suite 200  
Denver, Colorado 80202  
Attn: Richard Halvey

DATE BID DUE: **October 28, 2003, 2:00 PM Mountain Daylight Time**

Bids properly marked as to BID NO., DATE, and HOUR of opening, subject to the conditions herein stipulated and in accordance with the specifications set forth and/or attached hereto, will be accepted at the address listed above, prior to the date and time listed for the bid opening. All bids shall be quoted F.O.B. destination, unless otherwise specified, to the delivery location or jobsite listed herein.

SEALED COMPETITIVE PROPOSAL FOR:  
**Design and Implementation of an  
Emissions Data Management System**

Prices shall be quoted F.O.B. destination and include delivery to the Western Governors' Association. See attached pages for terms and conditions and proposal requirements.

**IMPORTANT:** Bidders should read the entire document before submitting bid.  
**BIDS MUST BE SIGNED IN INK.**

TERMS: Terms of less than 30 calendar days will not be considered.

\_\_\_\_\_  
TYPED OR PRINTED SIGNATURE

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Handwritten signature by Authorized  
Officer or Agent of Vendor (in ink)

\_\_\_\_\_  
VENDOR NAME AND ADDRESS

TITLE \_\_\_\_\_  
DATE \_\_\_\_\_  
PHONE # \_\_\_\_\_

The above bid is subject to Terms and Conditions on attached sheets.

**RETURN THIS COPY**

**PROPOSER COST SUBMITTAL**

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PROPOSER'S NAME

---

PROPOSER'S ADDRESS STREET AND NUMBER

---

CITY

STATE

ZIP CODE

---

NAME OF AUTHORIZED OFFICIAL (PRINT OR TYPE)

---

OFFICIAL TITLE

---

SIGNATURE OF AUTHORIZED OFFICIAL

---

TELEPHONE NUMBER

---

E-MAIL ADDRESS

TOTAL COST

\_\_\_\_\_

## **RFP TERMS AND CONDITIONS**

1. **LATE BIDS/PROPOSALS WILL NOT BE ACCEPTED OR CONSIDERED.** It is the responsibility of the bidder/proposer (hereinafter “bidder” or “proposer”) to ensure that the bid/proposal (hereinafter “bid” or “proposal”) arrives prior to the time and at the place indicated in the bid. Telephone or facsimile responses will not be accepted.
2. Specifications are provided to identify product/service required and to establish an acceptable quality level. Bids on products of equal quality and usability will normally be considered unless otherwise stated. The Western Governors’ Association (WGA) will be the sole judge in determining “equals” in regard to quality, price and performance. Samples of product(s), when required, must be furnished free of expense to the WGA, and, if not destroyed by tests, may upon request at the time the sample is furnished, be returned at bidder’s expense. Failure to furnish brochures, specifications, and/or samples as requested may be sufficient cause for rejection of bids.
3. Bidders shall furnish all the information required and are expected to examine the drawings, specifications, schedule of delivery and all instructions. Should the bidder find any part of the listed specifications, terms and conditions to be discrepant, incomplete or otherwise questionable in any respect, it shall be the responsibility of the bidder to call such matters to the attention of the WGA immediately. Failure to do so will be at the bidder’s risk. All official changes to this bid will be furnished, in writing by the WGA.
4. The bidder shall furnish the products and/or services in strict accordance with the specifications, and at the price set forth for each item. In case of error in extension, the unit price will prevail. All products quoted shall be newly manufactured and of the manufacturer’s current model, unless otherwise specified.
5. Bidders must furnish all Material Safety Data Sheets (MSDS) for any chemicals or hazardous materials. Awards may not be made if MSDS are not received by the WGA.
6. The bid should be returned in an envelope sealed and properly marked as to bid number and opening time and date.
7. No bid shall be withdrawn for a period of less than sixty (60) calendar days subsequent to the opening of the bids, unless otherwise stipulated by the WGA.
8. **Americans with Disabilities Act (ADA) Requirements.** The vendor assures that, at all times during the performance of this contract, no qualified individual with a disability shall, by reason of that disability, be excluded from participation in, or be denied benefits of services, programs, or activities performed by the vendor or be subject to any discrimination by the vendor.
9. **Independent Contractor.** The contractor shall perform its duties herein as an independent contractor and not as an employee. Neither the contractor nor any agent or employee of

the contractor shall be, or shall be deemed to be, an employee or agent of the WGA. Contractor shall pay when due all required employment taxes and income tax withholding, shall provide and keep in force workers compensation (and show proof of such insurance) and employment compensation insurance in the amounts required by law, and shall be solely responsible for the acts of the contractor, its employees, and its agents.

10. Bidder agrees to comply with all applicable federal and state laws, regulations and policies, as amended, including those regarding discrimination and unfair labor practices.

## ADMINISTRATIVE INFORMATION

- A. ISSUING OFFICE: This Request For Proposal (RFP) is issued by the Western Governors' Association (WGA). The WGA is the sole point of contact on this RFP.
- B. INVITATION TO SUBMIT PROPOSALS: The WGA is hereby contacting prospective offerors who have an interest or are known to do business relevant to this RFP. All interested offerors who were not contacted are invited to submit a proposal in accordance with the rules, procedures and dates set forth herein. In the event of "No Bid", please sign the Invitation for Bid form, indicating "No Bid," and return it to the WGA.
- C. PURPOSE: This RFP provides prospective offerors with sufficient information to enable them to prepare and submit proposals for consideration by the WGA to satisfy the need for expert assistance in the completion of the goals of this RFP.
- D. SCOPE: This RFP contains the instructions governing the proposal to be submitted and the material to be included therein, including mandatory requirements which must be met to be eligible for consideration.

E. SCHEDULE OF ACTIVITIES:

|    |                                                        |            |
|----|--------------------------------------------------------|------------|
| 1. | RFP Published                                          | 10/02/03   |
| 2. | Pre-Proposal Conference                                | 10/14/03   |
| 3. | Prospective Offerors' Written Inquiry                  | 10/16/03   |
| 4. | Proposal Submission                                    |            |
|    | 5 hard copies including original and 1 electronic copy | 10/28/03   |
| 5. | Bidder Interviews (option of the WGA)                  | 10/30/03   |
| 6. | Proposal Selection (estimated)                         | 11/03/03   |
| 7. | Contract Finalized (estimated / week of)               | 11/10/03   |
| 8. | Contract Period                                        | 11/03-3/05 |

- F. INQUIRIES: Unless otherwise noted, prospective offerors may make written inquiries concerning this RFP to obtain clarification of the requirements. No inquiries will be accepted after the date/time indicated in the Schedule of Activities. Send all inquiries to:

Western Governors' Association  
1515 Cleveland Place, Suite 200  
Denver, Colorado 80202  
Attn: Richard Halvey (rhalvey@westgov.org)

Response to offerors inquiries will be made in writing in a timely manner to all prospective offerors. Any oral interpretations of clarifications to this RFP shall not be relied upon. All changes to this RFP must be in writing to be valid.

- G. MODIFICATION OR WITHDRAWAL OF PROPOSALS: Proposals may be modified or withdrawn by the offeror prior to the established due date and time.
- H. PROPOSAL SUBMISSION: Proposals must be received on or before the date and time indicated in the Schedule of Activities. Late proposals will not be accepted. It is the responsibility of the offeror to ensure that the proposal is received by the WGA on or before the proposal opening date and time. Offerors mailing their proposals shall allow sufficient mail delivery time to ensure receipt of their proposals by the time specified. The proposal package shall be delivered or sent by mail to:

Western Governor's Association  
1515 Cleveland Place, Suite 200  
Denver, Colorado 80202  
Attn: Richard Halvey

The WGA Invitation for Bid form must be signed in ink by the offeror or an officer of the offeror legally authorized to bind the offeror to the proposal. Proposals that are determined to be at variance with RFP requirements may not be accepted. Proposals must be submitted and sealed in a package showing the following information on the outside of the envelope:

OFFEROR'S NAME  
RFP-NO.  
PROPOSAL DUE DATE AND TIME

- I. ADDENDUM OR SUPPLEMENT TO REQUEST FOR PROPOSAL: In the event that it becomes necessary to revise any part of this RFP, an addendum will be provided to each offeror who received the original RFP. It is the responsibility of offerors, prior to the bid date, to enquire as to addenda issued and ensure their bid reflects any and all changes. The WGA will maintain a register of holders of this RFP. Any party receiving this RFP other than from the WGA should inform the WGA of its interest in order to ensure receipt of any addenda.
- J. BIDDER INTERVIEWS: Offerors who are deemed most qualified after initial evaluation may be asked to interview with the selection committee.
- K. ACCEPTANCE OF RFP TERMS: A proposal submitted in response to this RFP shall constitute a binding offer. Acknowledgment of this condition shall be indicated by the signature of the offeror or an officer of the offeror legally authorized to execute contractual obligations. A submission in response to this RFP acknowledges acceptance by the offeror of all terms and conditions, including compensation, as set forth herein. Any offeror shall identify clearly and thoroughly any variations between its proposal and this RFP. Failure to do so shall be deemed a waiver of any rights to subsequently modify the terms of performance.

- L. PROTESTED SOLICITATIONS AND AWARDS: Any actual or prospective offeror or contractor who is aggrieved in connection with the solicitation or award of a contract may protest to the Executive Director of the WGA. The protest shall be submitted in writing within seven working days after such aggrieved person knows or should have known.
- M. COST DATA/BUDGET: Proposals for \$10,000 or more must include Cost/Data/Budget providing factual information concerning the cost of labor, material, travel, overhead and other cost elements expected to be incurred.
- N. CONFIDENTIAL/PROPRIETARY INFORMATION: Any restrictions on the use or inspection of material contained within the proposal shall be clearly stated in the proposal itself. Written requests for confidentiality shall be submitted by the offeror with the proposal. The offeror must state specifically what elements of the proposal are to be considered confidential or proprietary. Confidential and proprietary information must be readily identified, marked and separated/packaged from the rest of the proposal. Co-mingling of confidential or proprietary information and other information is not acceptable. The WGA will make a written determination as to the apparent validity of any request for confidentiality and send it to the offeror. Neither a proposal in its entirety nor proposal price information will be considered confidential or proprietary. Any information that will be included in any resulting contract cannot be considered proprietary.
- O. RFP RESPONSE MATERIAL OWNERSHIP: All material submitted regarding this RFP becomes the property of the WGA. Proposals may be reviewed by any person after the Notice of Intent to Award letter has been issued. The WGA reserves the right to use any and all information and material presented in reply to the RFP, subject to the limitations outlined in (N), Confidential/Proprietary Information. Disqualification of an offeror does not eliminate this right.
- P. PROPOSAL PRICES: Estimated proposal prices are not acceptable. Best and final offers cannot be considered in determining the apparent successful offeror. All work toward a deliverable task will be billed on a time and materials basis subject to a not to be exceeded budget for each deliverable task or contract. All work will be performed consistent with the schedule specified in the contract.
- Q. SELECTION OF PROPOSAL: All offerors will be notified in writing regarding the results of the RFP evaluation. Upon review and approval of the evaluation committee's recommendation for award, the WGA will issue a Notice of Intent to Make Award letter to the apparent, successful offeror. A contract must be completed and signed by all parties concerned on or before the date indicated in the Schedule of Activities. If this date is not met through no fault of the WGA, the WGA may elect to cancel the Notice of Intent to Make Award letter and make the award to the next most responsive offeror.
- R. AWARD OF CONTRACT: The award will be made to that offeror whose proposal, conforming to the RFP, will be the most advantageous to the WGA, price and other factors considered.

- S. ACCEPTANCE OF PROPOSAL CONTENT: The contents of the proposal of the successful offeror, including persons specified to implement the project, will become contractual obligations if acquisition action ensues. Failure of the successful offeror to accept these obligations in a contract may result in cancellation of the award, and such offeror may be removed from future solicitations.
- T. STANDARD CONTRACT: The WGA reserves the right to incorporate standard WGA contract provisions into any contract resulting from this RFP.
- U. RFP CANCELLATION: The WGA reserves the right to cancel this Request for Proposal at any time without penalty.
- V. WGA OWNERSHIP OF CONTRACT PRODUCTS/SERVICES: Proposals, upon established opening time, become the property of the WGA. All products/services produced in response to the contract resulting from this RFP will become the sole property of the WGA. The contents of the successful offeror's proposal will become contractual obligations.
- W. INCURRING COSTS: The WGA is not responsible for any cost incurred by offerors prior to the issuance of a legally executed contract or procurement document. No proprietary interest of any nature shall occur until a contract is awarded and signed by all concerned parties.
- X. MINORITY PARTICIPATION: It is the WGA's goal to achieve maximum participation of minorities in the procurement process. Accordingly, minority enterprises are to be utilized whenever possible. By the submission of a proposal, the offeror shall agree to utilize the maximum amount of minority business firms that the offeror finds to be consistent with the efficient performance of any resulting contract.
- Y. NON-DISCRIMINATION: The offeror shall comply with all applicable state and federal laws, rules, and regulations involving non-discrimination on the basis of race, color, religion, national origin, age, or sex.
- Z. REJECTION OF PROPOSALS: The WGA reserves the right to reject any and all proposals and to waive informalities and minor irregularities in proposals received and to accept any portion of a proposal or all items proposed if deemed in the best interest of the WGA.
- AA. PARENT COMPANY: If an offeror is owned or controlled by a parent company, the name, main office address, and parent company's tax identification number shall be provided in the proposal.
- BB. NEWS RELEASES: News releases pertaining to this RFP shall not be made prior to execution of the contract without prior written approval of the WGA.

CC: CONTRACT CANCELLATION: The WGA reserves the right to cancel, for cause, any contract resulting from this RFP by timely written notice to the contractor.

DD. CERTIFICATION OF INDEPENDENT PRICE DETERMINATION:

1. By submission of this proposal, each offeror certifies, and in the case of a joint proposal each party thereto certifies, as to its own organization, that in conjunction with this procurement:
  - (a) The prices in this proposal have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other offeror or with any competitor;
  - (b) Unless otherwise required by law, the prices which have been quoted in this proposal have not been knowingly disclosed by the offeror prior to opening, directly or indirectly to any other offeror or to any competitor; and
  - (c) No attempt has been made or will be made by the offeror to induce any other person or firm to submit or not submit a proposal for the purpose of restricting competition.
  
2. Each person signing the Invitation for Bid form of this proposal certifies that:
  - (a) He is the person in the offeror's organization responsible within that organization for the decision as to prices being offered herein and that he has not participated, and will not participate in any action contrary to (1)(a) through (1)(c) above; or
  - (b) He is not the person in the offeror's organization responsible within that organization for the decision as to the prices being offered herein but that he has been authorized in writing to act as agent for the persons responsible for such decision in certifying that such persons have not participated, and will not participate in any action contrary to (1)(a) through (1)(c) above; and as their agent does hereby so certify; and he has not participated, and will not participate, in any action contrary to (1)(a) through (1)(c) above.
  
3. A proposal will not be considered for award where (1)(a), (1)(c), or (2) above has been deleted or modified. Where (1)(b) above has been deleted or modified, the proposal will not be considered for award unless the offeror furnishes with the proposal a signed statement which sets forth in detail the circumstances of the disclosure and the head of the agency, or his designees, determines that such disclosure was not made for the purpose of restricting competition.

EE. TAXES: The WGA, as a purchaser designated as a 501(c)(3) organization, is exempt from all federal taxes and from all state and local government use taxes. Seller is hereby notified that when materials are purchased in certain political subdivisions, the seller may be required to pay sales tax even though the ultimate product or service is provided to the WGA. This sales tax will not be reimbursed by the WGA.

- FF. ASSIGNMENT: Except for assignment of antitrust claims, neither party to any resulting contract may assign any portion of the agreement without the prior written consent of the other party.
- GG. AVAILABILITY OF FUNDS: Financial obligations of the WGA payable after the current fiscal year are contingent upon funds for that purpose being appropriated, budgeted, and otherwise made available. In the event funds are not appropriated, any resulting contract will become null and void, without penalty to the WGA.
- HH. INSURANCE: If the proposal so states, the contractor shall procure at its own expense, and maintain for the duration of the work, the following insurance coverages and provide the WGA with certificates as an additional insured.
1. Standard Worker's Compensation and Employers' Liability, as required by State statute, including occupational disease, and covering all employees at a work site.
  2. General Liability (PL & PD) (Minimum)
    - (a) Combined single limit - \$600,000 written on an occurrence basis.
    - (b) Any aggregate limit will not be less than \$1 million.
    - (c) Contractor must purchase additional insurance if claims reduce the annual aggregate below \$600,000.
    - (d) WGA to be named as additional insured on each comprehensive general liability policy.
    - (e) Certificate of Insurance to be provided to the WGA within 10 working days of the receipt of the award.
    - (f) Insurance shall include provisions preventing cancellation without 60 days prior notice by certified mail to the WGA.
  3. Automobile Liability (minimum). The Contractor shall carry a minimum of \$600,000 combined single limit auto insurance.
  4. Additional coverages may be required in specific solicitations.

For any insurances required by this RFP, a completed Standard Certificate of Insurance form shall be provided to the WGA by the contractor prior to the date of any contract.

- II. INDEMNIFICATION: To the extent authorized by law, the contractor shall indemnify, save and hold harmless the WGA, its employees, and agents, against any and all claims, damages, liability, and court awards including costs, expenses, and attorney fees incurred as a result of any act or omission by the contractor or its employees, agents, subcontractors, or assignees pursuant to the terms of the contract resulting from this RFP.
- JJ. VENUE: The laws of the State of Colorado, U.S.A. shall govern in connection with the formation, performance and the legal enforcement of any resulting contract.

## **Administrative**

1. All products/services produced in response to the contract resulting from this RFP will become the sole property of the WGA.
2. Computer code products produced for this project may remain confidential, but WGA will be able to manipulate as needed for this project.
3. The products/services resulting from this contract will not be subject to separate renewal or upgrade fees during the life of the contract.
4. Licenses for proprietary software and other products included as part of the package of products/services resulting from this contract will not be subject to separate renewal or upgrade fees.
5. The successful offeror will provide a warranty provision for the products/services resulting from this contract, for the life of the contract, starting from the date that the project deliverables are fully operational.
6. The capabilities of the project deliverables will be maintained from the date that the project deliverables are fully operational, such that staff turnover is less than 20% per year of the portion of the company or institution routinely operating the project deliverables.
7. The successful offeror may be an individual company, entity, or institution, or may be composed of a team of companies, entities, and/or institutions to handle the development and routine operations portions of this project.
8. No changes to the staffing of the prime and any subcontractors can be made without prior written approval by WGA.

## **1.0 Scope of Work**

### **1.1 Background**

The Western Regional Air Partnership (WRAP) is a collaborative effort of tribal governments, state governments, and various federal agencies to implement the recommendations of the Grand Canyon Visibility Transport Commission (GCVTC), and to develop the technical and policy tools needed by western states and tribes to comply with the U.S. Environmental Protection Agency's (EPA) regional haze rule (RHR). Other common western regional air quality issues raised by the WRAP membership may also be addressed. WRAP activities are conducted by a network of committees and forums composed of WRAP members and stakeholders who represent a wide range of viewpoints.

The WRAP Emissions Forum is interested in preparing a design, and implementing the operation of a comprehensive, web-based air pollution Emissions Data Management System (EDMS) to support state and tribal regional haze implementation plan development. This system is to be used for technical and policy evaluations by WRAP members, stakeholders, and other interested parties in the region. This Internet web page-based system is to be capable of:

- Receiving and storing emissions data in EPA-compliant emissions reporting formats commonly used by various agencies and sources with little or no additional effort;
- Producing user-specified reports (including model-ready input);
- Performing user-selected quality control and assurance tests;
- Allowing data queries and graphic display; and
- Presenting this information as geographic information system (GIS) displays, flat files, air quality model-ready input files, and in other formats.

The purpose of the EDMS is to be the home of regulatory emissions inventories, which are the basis for emissions control and management programs to be adopted by states and tribes through their regional haze implementation plans. The EDMS will be able to provide output files for emissions analyses and air quality modeling applications; the EDMS will not function as an emissions processing system such as the Sparse Matrix Operating Kernel Environment (SMOKE) system, or other emissions processing systems used in the air quality modeling system(s) at the WRAP Regional Modeling Center. The EDMS will be able to project emissions for future control scenarios for emissions analyses and air quality modeling applications. WRAP-designated economic and other data types and the associated models will be accessed by the EDMS operators for the purpose of projecting changes in emissions in future years.

The EDMS will receive, store, process, display and output emissions data. The EDMS is also to receive, store, process, and display combinations of the activity data and emissions calculation methods used to estimate emissions inventories. At a minimum, the display capabilities will include GIS functionality, tabular and flat file data formats, graphs and charts, and the ability to capture these displays in user-defined report formats. Following is a table of emissions source categories and the storage and use(s) of associated data in the EDMS:

## Emissions Source Categories and Associated Data in the WRAP EDMS

| Source Category | Reference Information<br>(emissions factors, geo-<br>location, metadata, et cetera) | Activity          | Emissions           |
|-----------------|-------------------------------------------------------------------------------------|-------------------|---------------------|
| Point           | X                                                                                   | X, CEM accessible | X                   |
| Area            | X                                                                                   | X                 | X                   |
| On-Road Mobile  | X, emissions model                                                                  | X                 | X                   |
| Non-Road Mobile | X, emissions model                                                                  | X                 | X                   |
| Road Dust       | X                                                                                   | X                 | X                   |
| Fire            | X                                                                                   | X                 | X, to be calculated |
| Biogenics       |                                                                                     |                   | X, from RMC*        |
| Windblown Dust  |                                                                                     |                   | X, from RMC*        |
| Canada          | X                                                                                   | X                 | X                   |
| Mexico          | X                                                                                   | X                 | X                   |

\* - Output files from WRAP Regional Modeling Center.

Appendix A: **Needs Assessment for Evaluation and Design of an Emissions Data Reporting, Management, and Tracking System Final Report**, identifies the specific findings, especially as they related to tracking requirements listed in §309 of the federal RHR (64 Federal Register 35714 – July 1, 1999), of the needs assessment analysis conducted to support the design and implementation of the EDMS. This report identifies the initial (Phase I) and longer-term (Phase II) needs of the EDMS. *This report contains an error, in terms of how fire emissions are represented for emissions analysis and air quality modeling purposes. The report states that fire emissions are treated as an area source, when in fact WRAP has chosen to characterize fire emissions as point sources in technical analyses completed to date.*

Appendix B: **Calculating and Tracking Fire Emissions Inventories**, defines fire emissions to be managed in the EDMS, identifies the sources of fire emissions activity data, and presents issues associated with calculation of fire emissions inventories.

The EDMS is envisioned to be a refinement and interpretation of the information in Appendices A and B, such that the final operational product is more than a simple reproduction of the tracking requirements listed in Appendix A, and anticipates a flexible design able to address the issues raised in Appendix B, as well as the capability to deal with the general accuracy, precision, completeness, and representativeness issues associated with emissions estimates, well-known among air quality professionals. The EDMS should be developed from a regulatory emission inventory point of view, by individuals knowledgeable in the origin and use of emissions data.

This scope of work is intended to acquire contract support to:

- Design, develop, write the computer code, and provide support software as needed for the EDMS;
- Test and refine the EDMS and its functions before routine operation begins;
- Provide hardware necessary to run the EDMS on a host computer network;

- Develop and implement quality assurance/control procedures and protocols for the routine users and operators of the EDMS;
- Provide for a phased implementation, maintenance, upgrade, and startup of routine operations for the EDMS, on the host computer network system, and then transition to ongoing operation;
- Draft, accept review and comment, and provide a final Users Manual for the EDMS;
- Provide training and continuing support for EDMS users;
- Provide a home location for the host computer network system, including staff; and
- Provide emissions data analysis and processing reports as requested.

## 1.2 Design Goals

*Back-end* - The following design goals are necessary considerations for the EDMS:

- Robust - The EDMS can be easily extended to new applications and adapted to different and more complex applications by extension of the EDMS rather than modification to the existing structure;
- Flexible - The EDMS can handle a variety of different applications in a consistent manner;
- Consistent - The components that make up the EDMS are designed around explicit conventions for style, structure, and format;
- Ease of Use - Users of the EDMS are not required to memorize complex structures or coding systems;
- Universal Acceptance - All users understand and accept the EDMS, including the regulated community, federal land managers, and regulatory agencies across all programmatic areas;
- Complete & Explicit - There is nothing implied about any of the information transmitted between parties;
- Compatibility - The conversion/integration of data from existing system is not unnecessarily complex;
- Rigorous - Definitions and principles upon which the EDMS is designed must be adhered to and well defined.

*Front-end Application* - The following design goals are necessary considerations for the EDMS:

- Robust - The EDMS can be easily extended to new modules and/or classes within the existing application, to include new applications;
- Flexible - The EDMS can handle a variety of different applications in a consistent manner;
- Ease of Use - Users of the EDMS are not required to memorize complex operations or coding systems associated with data input, editing, output, querying, reporting, archiving, unarchiving, et cetera;
- Consistent - Components that make up the EDMS are designed around explicit conventions for style, structure, and format;

- Universal Acceptance - All users understand and accept the EDMS, including the regulated community, federal land managers, and regulatory agencies across all programmatic areas;
- Complete & Explicit - There is nothing implied about any of the information and data contained in the application screen/windows, imports, exports, and reports;
- Compatibility - Interfaces with external applications/systems with the existing data management system is not unnecessarily complex;
- Rigorous - Definitions and principles upon which the EDMS is designed must be adhered to and well defined.

*Indexing* – The system must have the capability of indexing information, including, but not limited to the following:

- Point Sources
- Area Sources
- On-Road Mobile Sources
- Non-Road Mobile Sources
- Road Dust Emissions
- Fire Emissions Sources (wildland and agricultural burning activities)
- Biogenic Sources
- Windblown Dust Emissions Sources
- Canada Emissions
- Mexico Emissions
- Source Categories
- Pollutants
- Defined Areas
- States
- Tribal Reservations
- Tribal Reservations which are designated Class I areas
- Counties or Boroughs
- mandatory Federal Class I areas
- Nonattainment Areas
- Public Lands (by land manager)
- Private Lands
- Geographic locations
- Geographic Coordinates (township and range, UTM, latitude/longitude)
- Date/Time Intervals
- Physical Units
- Emission Units
- Emission Processes

The Emissions Forum wishes to have an EDMS designed, tested, procedures written, functioning, and on-line in a step-wise fashion by late 2004. Three major milestones are anticipated during the EDMS startup period, as described in #5 of the Tasks section, following, and also in #5 of the Deliverables section. Supporting tasks and deliverables are also described.

The EDMS Steering Committee will manage this project, under the direction of the WRAP Emissions Forum.

## **2.0 Tasks**

### **2.1 Design, develop, write the computer code, and provide support software as needed for the EDMS.**

Based on the **Key System Elements** subsections of the **Comparative Analysis (Section 3)**, and the **Recommendations (Section 4)** of the **Needs Assessment for Evaluation and Design of an Emissions Data Reporting, Management, and Tracking System Final Report**, the WRAP EDMS will be designed and developed, computer code written, and necessary support software identified through a process defined in an EDMS hardware and software development plan (Development Plan), addressing Tasks 1 through 9, below. This plan will be prepared in draft form by December 15, 2003, and after review by the WRAP EDMS Steering Committee and WGA, finalized in March 2004.

#### **EDMS - Detailed Design Specifications**

The successful offeror shall prepare the Development Plan for the EDMS, satisfying the requirements described in this RFP. The Development Plan shall include detailed specifications for the EDMS; a listing of all items to be delivered to WGA; a delivery schedule containing a delivery date for each deliverable; and a payment schedule setting forth the amount and time of compensation. The schedule proposed in the Development Plan shall comply with the milestone dates listed in Tasks 1 and 5 of this RFP, and provide refinements to the estimated deliverable dates identified for Tasks 2, 3, 4, 6, 7, 8, and 9. The Development Plan shall include a prototype of the EDMS including a complete set of proposed hardware, screen displays, menus, and standard report formats, so that WGA and the EDMS Steering Committee can review the EDMS user interface. WGA and the members of the Steering Committee shall have 60 days to review the Development Plan and prototype. Upon approval of the Development Plan and prototype, the offeror shall commence development of the software that will substantially conform to the requirements set forth in the Development Plan.

If the Development Plan is in WGA and the Steering Committee's reasonable judgment unsatisfactory in any material respect, WGA will prepare a detailed written description of the objections. WGA will deliver such objections to the offeror within 30 days of receipt of the Development Plan. The offeror will then have up to 30 days to modify the Development Plan to respond to the objections. WGA and the Steering Committee will have 30 days to review the modified Development Plan. If WGA and the Steering Committee deem the modified Development Plan to be unacceptable, WGA reserves the right to have the option of terminating the agreement, upon written notice, with the offeror or permitting the offeror to modify the Development Plan again under the procedure outlined in this paragraph.

#### **Procedure for Changes**

If at any time following acceptance of the Development Plan by WGA and the Steering Committee, WGA should desire a change in the offeror performance that will alter or amend the specifications or other elements of the Development Plan, WGA will submit to the offeror a written proposal specifying the desired changes. If offeror wishes to alter the Development Plan and specifications, the offeror will submit to WGA a written proposal specifying the desired changes. The offeror shall evaluate each such proposal at its standard rates and charges and develop a written response or proposal. The offeror's written response shall include a statement of the availability of the offeror's personnel and resources, as well as any impact the proposed changes shall have on the contract price, delivery dates, or warranty provisions of the agreement.

Changes to the Development Plan shall be accomplished through a Development Plan Modification Agreement. The Development Plan Modification Agreement shall be signed by authorized representatives of WGA and the offeror, whereupon offeror shall commence performance in accordance therewith.

## **2.2 Test and refine the EDMS and its functions before routine operation begins.**

The EDMS, as defined by its various functional sections, will be tested and refined as needed before routine operation begins. Following the EDMS Development Plan, each functional section and associated query capabilities will be subjected to alpha and beta testing, and approval by the Steering Committee, before moving to the next version of each functional section. The routine operation version of each functional section will be announced, and become operational, with the associated deliverables from Tasks 3, 4, 6, 7, and 8, following.

## **2.3 Provide hardware necessary to run the EDMS on a host computer network.**

As this is the startup for the EDMS, firm costs for initial hardware expenses will be provided for the development and test portions of the Development Plan schedule, accompanied by a projected annual allowance for technology replacement, for the routine operations of the EDMS. The WGA will own the EDMS hardware. The EDMS hardware will be solely dedicated to EDMS operations. If interested, the offeror can provide an option for leasing, rather than owning the hardware, at a flat rate per year. This option must include a comparison of lease versus purchased hardware costs, and describe why the lease option is advantageous to WGA.

## **2.4 Develop and implement quality assurance/control procedures and protocols for the routine users and operators of the EDMS.**

Data quality control and assurance are among the highest priorities for the WRAP EDMS, in terms of understanding the emissions-related data submitted, procedures and protocols to be applied to emissions-related data within the EDMS, and to output emissions data files to be provided by the EDMS. Conceptually, EDMS quality control (QC) is defined as relating to consistent maintenance of data integrity from emissions-related data sources to the EDMS, i.e., metadata, agencies' and other institutions' data methods and sources, data intake procedures, et cetera. EDMS quality assurance (QA) processes are related to verification, gap-filling, data

substitution, error correction, and processing needed to create output and display files and reports. QA/QC procedures and protocols will need to be able to be applied to emissions, activity, emissions factor, and other reference data inside the WRAP EDMS. The EDMS will have a Quality Assurance Project Plan (QAPP) developed and implemented. A complete draft QAPP for Steering Committee and EPA review will be prepared, and a final EPA-approved EDMS QAPP will be complete prior to the start of routine EDMS operations. Staff from the Quality Assurance office at EPA Region IX will act as the EPA reviewers for the EDMS QAPP.

**2.5 a. Construct the EDMS to allow intake and initial processing of state, tribal, and local air agencies' CERR 2002 NEI data submittals before July 1, 2004.**

States, tribes, and local air pollution control agencies will be submitting calendar year 2002 emissions data to the National Emissions Inventory (NEI), to comply with the EPA Consolidated Emissions Reporting Rule (CERR, 67 FR 39602-39616), by June 30, 2004. The CERR requirements are discussed in for the **Needs Assessment for Evaluation and Design of an Emissions Data Reporting, Management, and Tracking System Final Report**. This CERR data reporting effort will be the first time that many local, state, and tribal air agencies will report emissions data for rural and/or attainment areas in their respective jurisdictions. These data are the basis of the emissions inventories for WRAP regional haze planning. The EDMS will be ready to receive and apply QC to the data submitted by local air agencies, states, and tribes, in either batch files, or single record files, as county-level or, where appropriate, tribal reservation-level summaries. The EDMS will need to accommodate emissions data for the pollutants listed in the Needs Assessment Report, as well as activity data and emissions factors. The EDMS will need to provide completeness checks for local, state, and tribal emissions data when the EDMS receives their emissions data, including Continuous Emissions Monitor data if included. The EDMS will need to capture specifications for linked files/libraries, such as SCC profiles and hourly emissions profiles, from agencies submitting their CERR data.

**b. Implement and begin routine operation of the EDMS on the host computer network system on or before October 1, 2004.**

The EDMS will begin producing 2002 base year emissions inventories for point, area, mobile, fire, and road dust, based on available CERR emissions data submitted, and/or activity data and emissions factors selected by the offeror (the EDMS operator), and approved by the Steering Committee. All of the functional sections of the EDMS will be operational at this time. The EDMS will demonstrate compatibility with inputs submitted by tribes using the *Tribal Emissions Inventory Software Solution*. The EDMS will be capable of producing county-level, and where appropriate, tribal reservation-level emissions inventories for point, area, mobile, fire, and road dust at this time.

**c. Maintain, upgrade, and routinely operate the EDMS on the host computer network system, on an ongoing basis.**

The routine operation of the EDMS would be underway for the life of the contract. Tasks 6, 7, and 8 would be completed. A specific schedule for Task 9 would be provided by the Steering Committee, to cover reports needed during the life of the contract.

## **2.6 Provide an on-line Users Manual for the EDMS.**

Provide a draft on-line Users Manual, solicit and accept review, address comments, and publish a final version for ongoing use. A complete draft Users Manual for Steering Committee review will be prepared, and a final WRAP Emissions Forum-approved Users Manual will be complete prior to the start of routine EDMS operations. Update the Users Manual regularly during the life of the contract.

## **2.7 Provide training for EDMS users, and ongoing support.**

Training on the EDMS for local, state, and tribal air agencies' staff, as well as other WRAP users is critical to the system's success. The offeror will provide at least 2 options to accomplish the needed training, a high and low level of effort, including budgets and syllabi for the training sessions, as well as the same high and low effort options, for the budget and staff needed for telephone and on-line support of the EDMS. The offeror will provide a CERR Data Submission workshop with WRAP region states, tribes, and local air pollution control agencies by June 1, 2004. The purpose of this workshop is to exchange information about the planned intake capabilities and demonstrate data processing functions of the EDMS, and determine which states, tribes, and local agencies will be submitting data, and for which source categories these agencies will be submitting their emissions data. This workshop will be coordinated with WRAP staff and the EDMS Steering Committee.

## **2.8 Provide a home location for the host computer network system, including staff.**

As this is the startup for the EDMS, a firm budget for hosting of initial development work will be provided, accompanied by a projected annual allowance for routine operations work and a technology replacement program, which would become effective at the time routine EDMS operations begin. The offeror will provide cost data for both the direct and indirect charges associated with operating the EDMS on a host computer system. If the offeror wishes to provide multiple options for the host computer network, a comparative analysis must be provided with the cost options, describing the pros and cons of the various options. As the EDMS is also a long-term project, WGA is seeking discounted or waived overhead charges, as the EDMS will employ staff to operate it. No specific level or composition of staffing is presumed. At a minimum, the routine operation of the EDMS would be expected to need separate staff functions described as a Data Base Administrator (DBA), and a Data Analyst (DA). The DBA should be a computer systems expert, whose functions would include development, maintenance, operation, and updates of the EDMS functional sections, acting as the principle contact and project manager for the life of the contract. The DA should have significant expertise in air pollution emissions work, as well as having significant experience in operation of computer systems.

## **2.9 Provide emissions data analysis and processing reports as requested.**

Emissions analyses will be performed regularly using the report formats developed by the offeror, to support the development of regulatory emissions control or management programs, including spatial and temporal analyses of emissions data. The **Needs Assessment for Evaluation and Design of an Emissions Data Reporting, Management, and Tracking System Final Report** identifies more than 20 specified reports. These analyses could use routine report formats developed by the offeror, and/or special-purpose formats to be developed. These will include specialized or customized maps, tables, charts, et cetera, for the WRAP Forums and Committees, as well as for state, tribal, local air agencies, and federal land managers, as needed. Air quality model-ready files will be provided on a regular basis as well, including operation of EPA-approved, and other, models to estimate emissions as needed. The EDMS will also provide emissions data outputs from the system to EPA as part of regional technical support documents prepared for state and tribal use in creating regional haze implementation plans and periodic updates, as needed. The EDMS will act as the repository for the regulatory emissions inventories described in state and tribal implementation plans, so the EDMS will also need to provide version control for the emissions data stored within the EDMS.

## **3.0 Schedule/Deliverables**

- Task 2.1.** Draft EDMS Software Development Plan - December 1, 2003. Final EDMS Software Development Plan – March 2004.
- Task 2.2.** Alpha, beta, and routine operation versions for each functional section of the EDMS, base on the functional sections defined in the EDMS Software Development Plan. All Alpha versions – on or before April 15, 2004. All Beta versions – on or before June 15, 2004. Routine operation versions – appropriate sequence and timing with Tasks 5a, 5b, and 5c, below.
- Task 2.3.** Description and purchase prices of needed hardware for startup – RFP due date. Invoices showing startup hardware purchase prices for reimbursement by WGA – monthly during startup. Description and projected purchase prices for hardware update allowance – RFP due date. Invoices showing actual hardware update purchase prices for reimbursement by WGA – monthly during routine operations.
- Task 2.4.** Preparation plan for EDMS QAPP – December 1, 2003. Draft QAPP for Steering Committee and EPA review – May 1, 2004. Steering Committee- & EPA-approved QAPP – no later than October 1, 2004.
- Task 2.5a.** Provide a functional intake and processing EDMS module for the CERR 2002 NEI data submittals, including the elements listed for the Task 5a.
- Task 2.5b.** Provide a complete EDMS, with all functional sections operational. Testing of software, hardware installation, and QC/QA procedures and protocols described

in Tasks 1 through 5a would also be complete. This milestone denotes the start of routine EDMS operations.

- Task 2.5c.** Provide for the routine operation of the EDMS, including monthly progress reports. Complete reports for Tasks 6, 7, and 8. Provide a schedule for Task 9 reports.
- Task 2.6.** Draft of Users Manual by June 1, 2004. Solicit comments and responses, and summarize responses to comments by August 15, 2004. Publish Final Users Manual by October 1, 2004.
- Task 2.7.** A proposal with at least 2 options (high and low level of effort), including the budget and syllabi for training sessions, and budget and staff for telephone/on-line support, all by March 15, 2004. Complete CERR Data Submission workshop with WRAP region states, tribes, and local air pollution control agencies by June 1, 2004. Complete selected training sessions needed for users by the milestone dates identified in Task 5a and 5b. Develop a schedule, budget, and syllabi for ongoing (Task 5c – Routine Operations) EDMS training and support.
- Task 2.8.** Cost proposal for computer hosting for EDMS development – RFP due date. Cost proposal for computer hosting for routine EDMS operations for the life of the contract – RFP due date. Position descriptions, duties in the development and routine operations portions of the contract period, and costs for DBA and DSA – RFP due date.
- Task 2.9.** Cost proposal for routine and special emissions reports and/or analyses – RFP due date.

#### **4.0 THE PROPOSAL**

Any response to the RFP must be submitted in two parts:

A. Task completion requirements. Proposals should indicate the level of effort required, the approach to be taken (including examples of the potential formats for the final products), and include an estimate of hours and cost by task in tabular format.

B. Related experience. Successful bidders will have demonstrated expertise with the development of other data management systems, especially related to air quality data.

Proposal responses are limited to 25 pages, exclusive of key staff resumes and budgets. Five (5) copies of each proposal and one (1) electronic copy must be supplied. The electronic copy may be submitted either with the proposal response or by e-mail in Adobe Acrobat PDF format and should be exactly as the hard copy.

#### **4.1 Anticipated Cost**

The WGA is specifying an available upper limit of \$600,000 through December 31, 2004. We are not specifying an available upper limit for the period beyond that date at this time. However, bidders are encouraged to be cognizant that the WRAP prefers bidders with efficient budgets.

#### **4.2 Amendments to the RFP**

The WGA reserves the right to issue amendments in the form of addenda to this RFP prior to the date for proposal submissions. All persons known by the WGA to have received the RFP will be sent any and all amendments. Failure to acknowledge receipt of the amendments in accordance with the instructions contained in the addenda may result in proposals being rejected. The WGA will allow a reasonable time for the acknowledgment of receipt following issuance of the amendments.

The WGA reserves the right to issue amendments after the date of proposal openings. All persons submitting proposals will be sent any such amendments. The failure to acknowledge receipt of amendments provisions stated in the previous paragraph will apply to post-opening amendments as well.

#### **4.3 Submission of proposal**

All proposals must be received by the WGA, 1515 Cleveland Place, Suite 200, Denver, CO 80202 on or before 2:00 PM MDT on October 28, 2003. The proposals will be publicly acknowledged at that time. Acknowledgment of the proposers' submission will occur on October 29, 2003 or as soon as possible thereafter.

Telephone, telegraph, e-mail, or fax proposals will not be accepted in lieu of the hard copy submission. A late proposal will not be eligible for consideration and will be returned unopened, with notification of the reason for its refusal. Proposers must submit their cost proposal, rounded to the nearest dollar, on the proposal form that accompanies this RFP and sealed in an envelope.

#### **4.4 Modification of Proposal**

Proposal modification by amendment will be accepted on conditions that:

- 1) The amendment arrives before the deadline for proposal submittal;
- 2) The amendment is in writing and signed by the proposer; and
- 3) The proposal, as amended, conforms in all aspects to the requirements in this RFP.

#### **4.5 Withdrawal of Proposal/Mistakes in Bid**

A proposal may be withdrawn at any time prior to the proposal opening.

#### **4.6 Disqualification of Proposers**

The WGA reserves the right to reject any and all proposals in writing, before or after the opening, for evidence of conditions including but not limited to collusion with intent to defraud or other illegal practices on the part of the proposer.

#### **4.7 Non-Conformance**

Any proposal that does not conform to all of the requirements of the RFP may be rejected. The WGA will so notify the affected proposer in writing of the rejection and the reason for the rejection.

#### **4.8 Statement of Financial Condition**

A firm shall provide a statement regarding its financial viability. All proof is subject to review by the WGA and acceptance or rejection is at the discretion of the WGA.

The WGA reserves the right to ask for additional information concerning financial responsibility. If a proposer unreasonably fails to provide such information, the WGA may find the proposer to be non-responsive.

#### **4.9 Related Experience Statement**

The proposal must contain a proposer's experience statement as described below:

- 1) The proposer must provide a list of previous and current contracts of a similar nature, if any, which were awarded to the proposer by a governmental agency and/or the private sector. The statement should provide details on its management ability as well as its technical expertise and a listing of its projects and accomplishments.
- 2) The proposer must include the following in each list described above:
  - a. Contract duration, including dates;
  - b. Geographic area served; and
  - c. Name, address, and telephone number of the contracting agency which may be contacted for verification of all data submitted.

#### **4.10 Proposers Conference/Questions and Answers**

A proposers telephone conference will be held at 11:30 a.m. Mountain Standard Time on October 14, 2003. The call in number is 312-461-9324, access code 561007.

The WGA will accept written questions through the close of business October 16, 2003. The WGA will provide written answers to all written questions as expeditiously as possible to all persons and entities known to have received this RFP. The responses to questions will become a part of the RFP.

Any corrections or necessary revisions that are identified will result in a formal amendment to this RFP, which will be provided to all persons and entities known to have received this RFP.

#### **4.11 Evaluation of Proposals**

An evaluation committee will be established to evaluate all proposals in accordance with the evaluation factors stated in this RFP. After the initial review of the proposals by the evaluation committee, the proposers may be asked to make an oral presentation in support of their proposals. It is likely that the oral presentation will be done by telephone conference. Upon final consideration, the Emissions Reduction Task Team will make a recommendation to the Executive Director of the WGA. The Executive Director will make the final decision.

The evaluation committee is responsible for developing a final ranking of each proposal and recommending that the proposer with the best score be awarded the contract. In this capacity, the committee will:

- 1) Rate each proposal on the criteria; and
- 2) Develop a final ranking of each proposal with a narrative that addresses pertinent points and issues.

Proposals will be evaluated based on the following criteria:

- 1) The ability to provide sound technical support;
- 2) Experience with similar projects;
- 3) Personnel qualifications;
- 4) Availability and support of management;
- 5) Completeness and clarity of the proposal;
- 6) Cost;
- 7) Schedule; and
- 8) Offers of in-kind (no cost to the WGA) services from the bidder's organization, which will be reviewed under established WGA procedures

#### **4.12 Award of Contract**

The contract shall be awarded to the responsible proposer determined to be the most advantageous to the WGA based on the evaluation factors set forth in Section 4.11 of this RFP. After proposals are opened, meetings may be held with the proposers determined to be the most responsive. Discussion may be held to clarify requirements and to make minor adjustments in services to be performed and in related costs. Any change to the proposal shall be submitted/confirmed in writing by the contractor.

Before an award can be made to a proposer, the WGA reserves the right to reject any and all proposals or waive any minor nonsubstantive irregularity in proposals received. Upon selection of a proposal, the WGA will issue a Letter of Intent specifying a date by which a contract must be executed.

In the event the proposer the evaluation committee has determined to be the most advantageous withdraws their proposal, the award shall be given to the next declared most advantageous proposer as determined by the evaluation committee.

#### **4.13 Contract Duration and Renewal**

The WGA intends to sign the contract within 30 days or as soon as possible after notification to the successful proposer. The provisions of the contract will remain in force for a period not to exceed six months following the execution of the contract.

#### **4.14 WGA Preference**

Any or all proposals may be rejected in whole or in part if the executive director determines in writing that such action is in the WGA's best interest.

#### **4.15 Confidentiality**

The contents of all proposals, correspondence, working papers, and any other medium that discloses any confidential aspect of the proposal shall be held in the strictest confidence until notice of intent to award.

All proposals will be publicly opened. A register of proposals will be developed by the evaluation committee, providing a proposer name and description of that proposal. This register of proposals will be made public only after the contract is awarded. Confidential information submitted with proposals shall be readily separable and accompanied by a written request of confidentiality.

### **5.0 PRIME CONTRACTOR RESPONSIBILITIES**

If the proposal includes services supplied by other contractors, it will be mandatory for the successful proposer to identify them and to assume responsibility for their performance.

## **5.1 Subcontracting**

The Contractor's use of subcontractors shall not diminish the Contractor's obligations to complete the work in accordance with the contract. Each contractor shall control, coordinate, and be responsible for the work of subcontractors. The contractor shall be responsible for informing all subcontractors of all terms, conditions, and requirements of the contract. The WGA reserves the right to approve all subcontractors prior to their assumption of duties on behalf of the contractor. The contractor shall forward to the WGA a listing of each designated subcontractor that indicates their purpose or area of participation.

## **5.2 Patent and Copyright Infringement**

The contractor shall defend, protect, and save harmless the WGA, its officers, agents, and employees against all suits at law or in equity and from all damages, claims, or demands for actual or alleged infringement of any patent or copyright by reason of the contractor's use of any equipment or supplies in connection with the contract.

## **5.3 Conflict of Interest**

The contractor and/or subcontractors must affirm in writing that he/she currently has no interest and shall not acquire any interest, direct or indirect, which would pose a conflict of interest in any manner or degree with the performance of services required by this RFP for the life of the contract.

## **6.0 CONTRACT GENERAL TERMS**

A proposer's response to this RFP shall be considered as the proposer's formal offer. The WGA reserves the right to negotiate additional contract terms within the scope of the RFP. The signing of the contract by the WGA shall constitute the WGA's written acceptance of the successful proposal.

# **Appendix A**

**FINAL**

## **NEEDS ASSESSMENT FOR EVALUATION AND DESIGN OF AN EMISSIONS DATA REPORTING, MANAGEMENT, AND TRACKING SYSTEM**

Prepared for

Western Governor's Association  
Western Regional Air Partnership  
1515 Cleveland Place  
Suite 200  
Denver, Colorado 80202



Prepared by

EA Engineering, Science, and Technology  
15 Loveton Circle  
Sparks, MD 21152

July 25, 2003

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EA Project No: 1406601

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## **1.0 INTRODUCTION**

### **1.1 Regional Haze**

Regional haze is defined as air pollution that is transported long distances and reduces visibility in national parks and wilderness areas. The pollutants that create this haze are sulfates, nitrates, organic carbon, elemental carbon, and soil dust. Human-caused haze sources include industry, motor vehicles, agricultural and forestry burning, and windblown dust from roads and farming practices.

In 1999, the US Environmental Protection Agency (EPA) issued regulations that address regional haze in one hundred fifty six (156) national parks and wilderness areas across the country. The goal of the Regional Haze Rule (RHR) is to eliminate human-caused visibility impairment in national parks and wilderness areas across the country. It contains strategies to improve visibility over the next sixty (60) years, and requires states to adopt implementation plans.

The RHR provides two paths to address regional haze. One is 40 CFR 51.308 (Section 308), and requires most states to develop long-term strategies out to the year 2064. These strategies must be shown to make “reasonable progress” in improving visibility in Class I areas inside the state and in neighboring jurisdictions. The other is 40 CFR 51.309 (Section 309), and is an option for nine states - Arizona, California, Colorado, Idaho, Nevada, New Mexico, Oregon, Utah, and Wyoming - and the two hundred eleven (211) Tribes located within those States to adopt regional haze strategies for the period from 2003 to 2018. These strategies are based on recommendations from the Grand Canyon Visibility Transport Commission (GCVTC), for protecting the sixteen (16) Class I areas in the Colorado Plateau area (GCTVC, 1996). Adopting these strategies constitutes reasonable progress until 2018. These same strategies can also be used by the nine western states and tribes to protect the other Class I areas within their own jurisdiction.

The RHR specifically requires comprehensive emissions tracking and reporting for clean air corridors (CAC), sulfur dioxide (SO<sub>2</sub>) stationary sources, fire sources, mobile sources, and windblown dust sources among other requirements.

### **1.2 Consolidated Emission Reporting Rule**

One of the recent EPA’s rules that will affect the data submission requirements of the RHR is the Consolidated Emission Reporting Rule (CERR) (67 FR 39602-39616) issued in 2002. The CERR will simplify and consolidate emissions inventory reporting requirements to a single location within the CFR and establish new reporting requirements related to particulate matter with aerodynamic size less than 2.5 μm (PM<sub>2.5</sub>), regional haze, and statewide reporting of area and mobile source emissions. In fact, new inventories will add PM<sub>2.5</sub> and ammonia (NH<sub>3</sub>). Currently area and mobile sources are reported by nonattainment area, and under the CERR, inventories will include all sources statewide by county. Moreover, there will be an option to report smaller point sources once every three years or one-third of the sources every year.

### **1.3 RPO Data Exchange Protocol**

The RPO data exchange protocol will also affect the data submission and reporting requirements. The goal of the RPO data exchange protocol is to facilitate the sharing of databases for emissions modeling in a regionally consistent and model-independent nature. Therefore, it seeks to develop data exchange formats and naming conventions so that emissions modelers from the five RPOs and states and tribes have common datasets from which to pursue regulatory modeling of ozone (O<sub>3</sub>), regional haze, and PM. It includes nine different protocols:

- Industrial point source protocol
- Area source protocol
- Temporal allocation and profile assignment protocol
- On-road mobile sources protocol
- Off-road mobile sources protocol
- Continuous emissions monitoring and day-specific protocol
- Spatial surrogate protocol
- Speciation profile protocol
- Growth and control factors protocol

The data sources, data formats, and issues associated with each of these protocols are further detailed in the Midwest RPO's *Draft RPO Data Exchange Protocol* (Pechan, 2003).

### **1.4 Western Regional Air Partnership**

The Western Regional Air Partnership (WRAP) is a regional planning organization (RPO) that was established in 1997 as the successor organization of the GCVTC. The WRAP is a collaborative effort of tribal governments, state governments, and various federal agencies to implement the recommendations of the GCVTC and to develop the technical and policy tools needed by western states and tribes to comply with the RHR. The WRAP Emissions Forum (EF) oversees the development of a comprehensive emissions tracking and forecasting system which can be utilized by the WRAP or its member entities to monitor the trends in actual emissions, and forecast the anticipated emissions which will result from current regulatory requirements and alternative control strategies. In addition, this forum is responsible for the oversight of the assembly and quality assurance of the emissions inventories and forecasts to be utilized by the WRAP forums.

### **1.5. Regulatory Framework for Tribal Visibility Implementation Plans**

The RHR explicitly recognizes the authority of tribes to implement the provisions of the rule, in accordance with principles of federal Indian law, and as provided by the Clean Air Act (CAA) Section 301(d) and the tribal authority rule (TAR) (40 CFR 49.1–11). Those provisions create the following framework:

- Absent special circumstances, reservation lands are not subject to state jurisdiction.
- Federally recognized tribes may apply for and receive delegation of federal authority to implement CAA programs, including visibility regulation, or "reasonably severable"

elements of such programs (40 CFR 49.3, 49.7). The mechanism for this delegation is a tribal implementation plan (TIP). A reasonably severable element is one that is not integrally related to program elements that are not included in the plan submittal, and is consistent with applicable statutory and regulatory requirements.

- The RHR expressly provides that tribal visibility programs are “not dependent on the strategies selected by the state or states in which the tribe is located” (64 FR 35756), and that the authority to implement Section 309 TIPs extends to all tribes within the GCVTC region (40 CFR 51.309(d)(12)).
- The EPA has indicated that under the TAR, tribes are not required to submit Section 309 TIPs by the end of 2003. Rather, they may choose to opt-in to Section 309 programs at a later date (67 FR 30439).
- Where a tribe does not seek delegation through a TIP, EPA, as necessary and appropriate, will promulgate a federal implementation plan (FIP) within reasonable timeframes to protect air quality in Indian country (40 CFR 49.11). EPA is committed to consulting with tribes on a government-to-government basis in developing tribe-specific or generally applicable TIPs where necessary (63 FR 7263-64).

The amount of modification, if any, needed for this report to fulfill tribal needs may vary considerably from tribe to tribe. The authors have striven to ensure that all references to tribes in the document are consistent with principles of tribal sovereignty and autonomy as reflected in the above framework. Any inconsistency with this framework is strictly inadvertent and not an attempt to impose requirements on tribes, which are not present under existing law.

Tribes, along with states and federal agencies, are full partners in the WRAP, having equal representation on the WRAP Board as states. Whether Board members or not, it must be remembered that all tribes are governments, as distinguished from the “stakeholders” (private interest) which participate on Forums and Committees but are not eligible for the Board. Despite this equality of representation on the Board, tribes are very differently situated than states. There are over four hundred (400) federally recognized tribes in the WRAP region, including Alaska. The sheer number of tribes makes full participation impossible. Moreover, many tribes are faced with pressing environmental, economic, and social issues, and do not have the resources to participate in an effort such as the WRAP, however important its goals may be. These factors necessarily limit the level of tribal input into and endorsement of WRAP products.

The tribal participants in the WRAP, including Board members, Forum and Committee members, and co-chairs, make their best effort to ensure that WRAP products are in the best interest of the tribes, the environment, and the public. One interest is to ensure that WRAP policies, as implemented by states and tribes, will not constrain the future options of tribes who are not involved in the WRAP. With these considerations and limitations in mind, it is anticipated that the tribal participants will join the state, federal, and private stakeholder interests in approving this report as a consensus document.

## **1.6 Objectives**

The EF is currently seeking to implement a comprehensive internet web-based air pollution emissions data reporting, management, and tracking system to support state and tribal regional haze implementation plan (SIP/TIP) development. The system is to be capable of receiving and storing emissions data in EPA-compliant emissions reporting formats commonly used by various agencies and sources with little or no additional effort, producing user-specified reports, performing user-selected quality control and assurance tests, allowing data queries and graphic display, and presenting this information in geographic information system (GIS) format.

The EF contracted with EA Engineering, Science, and Technology, Inc (EA) to assess the needs of the WRAP emissions database management system (WRAP EDMS). The overall approach of this needs assessment consists of the following tasks.

- Task 1: Determine the emissions data to be reported, managed and tracked.
- Task 2: Conduct a comparative analysis of existing emissions data management systems approved and in use by EPA and state air quality agencies.
- Task 3: Prepare a report addressing issues associated with developing a new system, long-term system maintenance and operation of the recommended data management system, by integrating information gathered in Tasks 1 and 2.

This report presents the results of Task 3 and represents the final technical report of the project. It provides the documentation from the two workshops and questionnaires; the findings based on the input received from the two workshops and questionnaires, an evaluation of existing EDMS, and the system recommendations.

## **2.0 WORKSHOP AND QUESTIONNAIRE FINDINGS**

### **2.1 Description of the Workshops**

The WRAP EDMS needs assessment survey consisted of two interview workshops. The first workshop took place in Santa Fe, New Mexico, on March 20<sup>th</sup>, 2003. It was intended for members of the WRAP Forums. Thirty-five (35) people attended the meeting. The workshop lasted approximately three hours, and included a presentation by the EA team covering the project overview and timeline, the goals and roles of the WRAP EDMS, a comparative summary of existing systems, a straw man presentation of the conceptual WRAP EDMS, and the conceptual timeline of the development and population of the WRAP EDMS. The presentation was followed by specific discussions on the WRAP EDMS needs. Appendices A1, A2, and A3 present the EA presentation, a summary of the discussion points, and the list of the workshop participants respectively.

The second workshop took place in Denver, Colorado, on May 7<sup>th</sup>, 2003 and was planned in order to provide an opportunity for state, tribe, and local (STL) air pollution control agencies staff and other stakeholders to participate in the project. Prospective attendees were notified by email several weeks prior to the meeting, and via an online questionnaire. Thirteen (13) people attended this day long workshop. The session included a presentation by the EA team that covered the project overview and timeline, the goals and roles of the WRAP EDMS, a summary of the RHR and CERR, a comparative summary of existing systems, a straw man presentation of the conceptual WRAP EDMS, the conceptual timeline of the development and population of the WRAP EDMS, and the summary of the Santa Fe workshop. This was followed by an oral presentation of the special needs of the Fire Emission Joint Forum (FEJF) and specific discussions on the WRAP EDMS needs were brought up during and after the presentations. Appendices B1, B2, and B3 present the EA presentation, a summary of the discussion points, and the list of the workshop participants respectively.

### **2.2 Description of Questionnaire**

As mentioned above, in addition to the interview workshop, a web-based questionnaire was posted on <http://wrap.eaest.com> for a period of three months. All potential users of the WRAP EDMS, stakeholders, and interested parties were invited to fill it out. The questionnaire comprised thirty-four (34) questions designed to collect ideas on all the possible needs of the WRAP EDMS. Overall, twenty (20) peoples responded to the web-based questionnaire. Appendix C shows the results of this questionnaire. Furthermore, one person responded to this questionnaire via email before it was posted on the internet. Appendix C also shows these responses.

### **2.3 Findings**

The workshop interviews and questionnaire results underscored the emerging project consensus that the WRAP EDMS needs to be different from any of the other existing systems (including the national emissions inventory (NEI)) because of its architecture, technical capabilities, and contents. The system needs to be developed with all possible users in mind, and with the intent

to accommodate several distinct user groups. The WRAP EDMS will not only be a repository of the WRAP regional emissions inventories but will also be able to be used to implement the emissions tracking and reporting requirements of the RHR. The WRAP EDMS would be located either at the WRAP regional modeling center (RMC) or at a university center as is the monitoring database. Moreover, it will be made publicly accessible through the internet and will contain online training manuals.

The WRAP EDMS will track all the visibility-impairing pollutants: volatile organic compounds (VOC), nitrogen oxides (NO<sub>x</sub>), SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, elemental carbon (EC), organic carbon (OC), carbon monoxide (CO), and NH<sub>3</sub> and all the necessary activity data for all the sources and emission factors needed to calculate their emissions.

A metadata describing and characterizing all of the emissions data will be developed. Furthermore, The WRAP EDMS will be linked to other related external databases. These databases will contain related surrogate and activity data used to estimate some of the emissions such as mobile, biogenic, and windblown dust sources emissions as well as speciation profiles for VOC and PM data. The WRAP EDMS will also adopt the RPO data exchange protocol in order to capture all the necessary external data.

The emissions data will primarily be submitted by STL agencies. Emissions from mobile, biogenic, and windblown dust sources may be estimated through modeling using activity data submitted by STL agencies and other surrogate data. The estimated emissions will be sent to STL agencies for review and approval before inclusion in the final database. Fire source emissions data that are not generated by STL agencies will be estimated by the WRAP EDMS based on fire activity data submitted by STL agencies, federal agencies, private entities, or generated by WRAP. Some STL agencies may estimate fire emissions themselves. These emissions would be submitted by the STL agencies along with all the activity and surrogate data used for the estimation. WRAP will obtain and process the international (Canada and Mexico) data.

The large majority of participants in both workshops felt that the WRAP EDMS should be developed and populated in two phases. In Phase I, the system will include the core database architecture, including all of the functioning modules and all of the reporting and queries capabilities (see Section 4). It will be used primarily to store emissions data that will be used to implement the tracking and reporting requirements of both Sections 308 and 309. The focus will be on the implementation of the emissions tracking and reporting requirements of the CAC, fire sources, stationary SO<sub>2</sub> sources, and mobile sources. The minimum spatial resolutions of the emissions data will be the county and reservation levels. The submittal temporal resolution of the activity data would be variable (i.e. hourly, daily, seasonal, and annual) depending on the source category. However, the emissions will be reported and tracked on an annual resolution basis.

In Phase II, the system could be expanded to incorporate new and updated technical functionality that would allow for storage, tracking, and reporting of hourly, daily, seasonal, and annual emissions data as necessary. The system would include others pollutants (e.g. methane (CH<sub>4</sub>), mercury (Hg), etc) and their emissions data. It may be used to track other RHR requirements

(e.g. annual emission goals) and other regulations (e.g. Clear Skies, Greenhouse Gas, etc) requirements.

There was general agreement that the WRAP EDMS will be built and tested by the end of 2003 and will be live on the web in early 2004. This first version of the WRAP EDMS will be populated with the 2002 comprehensive emissions data. The collection, processing, and quality assurance/quality control (QA/QC) of these data from the STL agencies will start in early 2004 and will continue throughout 2004. At the same time, the 2002 base and 2018 projection years' emissions files that will be used by RMC will be produced. The system will also produce the emission reports as needed for both Sections 308 and 309. From 2005 to 2007, annual emissions will be generated from the 2002 comprehensive emissions data in order to satisfy the tracking and reporting requirements of the RHR. At the same time, refined emissions inventories representing the effect of control strategies in 2018 will be developed, and the 2005 comprehensive emissions data will be collected from STL agencies, processed, and QA/QC'd. It should be noted that the emissions data submitted by tribal agencies may be from any given inventory year. Moreover, wherever tribal emissions data are available, the state should adjust its inventory taking into account these tribal data. The conceptual development timeline of the WRAP EDMS is as follow.

- Mid 2003: finish needs assessment project
- Late 2003:
  1. WRAP contractor builds and alpha tests Phase I of WRAP EDMS
  2. Beta test of the WRAP EDMS
- Early 2004:
  1. Initiate live Phase I of the WRAP EDMS on the web
  2. Provide training and user support
- Throughout 2004: begin collection, processing, and QA/QC of 2002 emissions from STL agencies
- Late 2004:
  - Implement Phase II of the WRAP EDMS
  - Provide training and user support
  - Produce emissions reports as needed for Section 308 and 309 requirements
  - Prepare 2002 base and 2018 projection years' emissions files for use by RMC
- 2005-2007: ongoing operation of the WRAP EDMS
  - Track emissions as needed for Section 308 and 309
  - Develop refined emissions inventories representing the effect of control strategies in 2018
  - Provide training and user support
  - Populate the WRAP EDMS with annual emissions data to meet Section 308 and 309 regulatory requirements
  - Collection, processing, and QA/QC of 2005 emissions from STL agencies

There was also consensus that the WRAP EDMS should be built in a modular fashion, to allow for easy expansion and improvement. It will include six major modules representing the sources (point, area, fire, mobile, windblown dust, and biogenic) in addition to the GIS, QA/QC, and database administrator (DBA) modules. The submission formats will be similar to that of the

NEI format (NIF) and the minimum submission cycle would coincide with the submission cycle of the NEI (annual and triennial cycles). However, the WRAP EDMS will have an open submittal process, where STL agencies' emissions data will be submitted at different times. Currently, state submit the NIF in several file formats including ASCII Text (Text), Microsoft Access database (MS Access), and eXtended Markup Language (XML). The results of the questionnaire indicated that, across the WRAP region, states are using Text, MS Access, in-house developed systems, and other systems (i.e. AMS Tempo) that need to be converted to the NIF. Therefore, the WRAP EDMS will accept all the file formats already accepted by NEI.

The WRAP EDMS will be managed by a DBA whose functions could include QA/QC, some emission calculations, data gap filling, data archiving, and data version management among others.

## **3.0 COMPARATIVE ANALYSIS**

### **3.1 Conceptual WRAP EDMS**

The conceptual WRAP EDMS was developed based on the findings of the interview workshops and the web-based questionnaire.

#### **3.1.1 Data Tracking**

The WRAP EDMS should contain all visibility-impairing pollutants: VOC, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, EC, OC, CO, and NH<sub>3</sub>. The WRAP EDMS should also track all necessary activity data for all the sources and emission factors needed to calculate emissions. These pollutants and related activity data should be tracked for the following sources: point, area, mobile, biogenic, windblown dust, and fire sources. The data will be tracked at the county and reservation level for all sources and also individually for point and fire sources. The emissions data will be submitted to the WRAP EDMS by STL agencies, except for biogenic, mobile, windblown dust, and certain fire sources emissions data that will be calculated by WRAP using emissions estimation models. The submissions will be in a standard format similar to the NIF and done at the NEI minimum cycle but STL agencies may submit emissions data frequently.

#### **3.1.2 Data QA/QC**

The WRAP EDMS should include a QA/QC module to perform two levels of QA/QC. The first level of QA/QC should include a validation of the format of the submitted data files. This will ensure that the submitting entity supply all data to WRAP in the expected format and also identify any errors. The submittal check will be at the point of entry to the WRAP EDMS in order to minimize the DBA work and encourage STL agencies to submit clean data. The second level of QA/QC should consist of checks of the data that is submitted to WRAP, and include checking reference values and acceptable data ranges for specific data points. The data should also be checked for completeness, ensuring that all data exists for all sources and geographic areas.

#### **3.1.3 Data Reporting**

The WRAP EDMS should include a series of standard summary reports broken down by source type, geographic location, and pollutant. It should also include a series of reports designed specifically to meet the RHR emissions tracking and reporting requirements. The RHR reports will include special reports for CAC, pre-trigger SO<sub>2</sub> stationary sources, mobile sources, fire sources, and windblown dust sources. The WRAP EDMS should also include a series of data export formats for inclusion in external systems including emissions modeling programs such as SMOKE (MCNC, 1999).

#### **3.1.4 GIS Components**

The WRAP EDMS should include a fully functioning GIS module that provides multiple tools to display data over the internet. The inclusion of a GIS module will provide a means for users to

select data that is of importance to them and display the data in a fashion that is easily understood. The WRAP EDMS should include the following GIS functionality: pan, zoom, query layer information, ability to add/remove multiple layers of data, point and click, measure distances, buffer, print multiple sizes of maps, and select map features by line, rectangle, or polygon.

The WRAP EDMS GIS module should include the following layers of data: county, state and country polygons, tribal reservation polygons, roadways and railroad line features, CAC polygons, international polygons, metropolitan statistical areas polygons, nonattainment area polygons, class I areas polygons, bodies of water polygons, census data polygons, other federal land polygons (i.e. national parks, monuments, forest, and refuges), and WRAP modeling domain grid system. It should have the ability to select and display emissions sources and associated emissions data by geographical area.

### **3.1.5 User Access and Preferences**

All reporting features of the WRAP EDMS should be available to the public via the internet. STL agencies will have a separate, non-public interface for submitting their data to a central submission area. The user interface for the WRAP EDMS should be easy and intuitive to use while providing all necessary functionality.

## **3.2 Comparison**

Five existing EDMS were evaluated and compared each to the conceptual WRAP EDMS. Each system was evaluated in terms of meeting the design and functionality requirements of the conceptual WRAP EDMS. As expected, none of the individual systems included all of the required elements for the conceptual WRAP EDMS. This was due in part to the fact that none of the systems tracked all of the required pollutants or included emissions data from all of the required, individual sources. In some instances, individual systems included most or all of the required functionality, such as a GIS module or the ability to export data, but did not track emissions data for all of the required pollutants or sources. Without all of the required data available, the output of these systems will be incomplete. Appendix D illustrates the overall comparison between the conceptual WRAP EDMS and the selected existing systems and Section 3.3 below describes these systems further.

## **3.3 Existing EDMS**

This section lists each of the selected five existing database management systems, provides a brief description and background information for each, and highlights any elements from each system that could be utilized by the WRAP EDMS.

### **3.3.1 National Emissions Inventory – NEI**

The EPA's Emission Factor and Inventory Group (EFIG) maintains a national emissions inventory containing information on air emissions and their sources for each state in the U.S., the U.S. Virgin Islands, Puerto Rico and the District of Columbia. The NEI has a public website

(<http://www.epa.gov/air/data/index.html>) where users can query the emissions database and produce reports based on their specific needs.

### ***3.3.1.1 System Details***

The NEI tracks seven pollutants: VOC, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, CO, and NH<sub>3</sub>. The pollutants are tracked for four source types: point, area, mobile, and biogenic sources. All data is tracked at the county level for all sources, and also individually for point sources. The data is submitted on an annual and triennial basis to EPA by state and tribal agencies. The data is submitted in the EPA's standard submission format, the NIF.

The NEI includes a QA/QC process that performs multiple levels of QA/QC checks. The first level consists of a validation of the format of the submitted data files, which ensures that the submitting entity supplied all data to NEI, in the expected format, and also identifies any errors with the submitted format. The second level of QA/QC checks includes checks of the data that is submitted to NEI. Reference values are checked against standard lists and data points are checked against acceptable data ranges. The data is also checked for completeness, ensuring that all data exists for all sources and geographic areas. If data points are missing, the NEI will replace the missing values with national averages or previous year data for the particular data point.

The NEI includes a series of standard summary reports broken down by source category, geographic location, and pollutant. The NEI also includes a data export feature to allow data to be extracted from the NEI database for inclusion in external systems.

The NEI includes a basic mapping capability to display emissions data over the internet. The NEI mapping functionality includes the ability to pan, zoom, and displays county, state and country boundaries.

All reporting features of the NEI are available to the public via the internet. The NEI user interface is easy to use and navigate to reach the desired data.

### ***3.3.1.2 Key System Elements***

The NEI has three key elements that should be utilized in the WRAP EDMS. First, the NEI requires a standard submission format (NIF) for all data submitted to the system. The WRAP EDMS could utilize this same submission format for all data sources, except for fire sources. The submission format captures the required emissions and activity data for all pollutants except OC and EC, which can be calculated by the WRAP system, based on the PM<sub>2.5</sub> data. Also, since STL agencies are already required to submit their data in the NIF format, no additional work will be necessary on their part to create submissions for the WRAP EDMS. See Appendix E for the recent version of the NIF submission formats.

Second, the NEI has a well-established and defined QA/QC process for all submitted emissions data. This process does a thorough analysis of the submission format and data content to identify

all possible issues before the data is included in the system. The WRAP EDMS could adopt a modified version of this QA/QC Process to ensure that all data submitted to the WRAP EDMS is accurate. However, instead of automatically replacing missing or erroneous data with a default set of data, WRAP could make recommendations for replacing missing data or supplementing existing data to STL agencies while leaving the final approval for all data included in the WRAP EDMS with them. See Appendix F for a detailed explanation of the NEI QA/QC process.

Finally, the NEI includes an adequate set of standard reports for users to utilize when accessing the NEI database. The set of reports is not exhaustive, but does provide an excellent basis for data reporting and gathering to serve the public's data needs. The NEI report interface is also very easy to use and intuitive, making the data gathering process easy for the user. The WRAP EDMS could adopt this report functionality and design for the general data gathering and reporting capabilities of its system.

### **3.3.2 Tribal Emissions Inventory Software Solution – TEISS**

Northern Arizona University is currently developing an air emissions inventory for all western region tribes. The Tribal Emissions Inventory Software Solution (TEISS) will be a desktop application where users can query the emissions database and produce reports based on their specific needs.

#### ***3.3.2.1 System Details***

The TEISS tracks seven pollutants: VOC, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, CO, and NH<sub>3</sub>. The pollutants are tracked for three source types: point, area, and mobile sources. All data is tracked at the reservation level for all sources, and also individually for point sources. The data is collected from the tribes on a continuing basis. The data is submitted in multiple formats and can also be hand-entered through data entry screens.

The TEISS includes a series of standard reports broken down by source category, geographic location, and pollutant. The TEISS also includes a data export feature to allow data to be extracted from the TEISS database for inclusion in external systems, including the NEI and modeling programs such as SMOKE.

The TEISS includes a fully functioning GIS module that provides multiple tools to display data geographically. The TEISS includes several advanced GIS features including: pan, zoom, query layer information, ability to add/remove multiple layers of data, measure distances, buffer, print multiple sizes of maps, and select map features by line, rectangle, or polygon. The TEISS GIS module includes several static layers of data, such as county, state and country, and tribal reservation boundaries, and the ability to select and display emissions sources and associated emissions levels by geographical area.

The TEISS utilizes an advanced user interface, since it is a desktop application and not accessible via the internet.

### **3.3.2.2 Key System Elements**

The TEISS has two key elements that should be utilized in the WRAP EDMS. First, the TEISS has a fully functioning GIS module embedded in the system. This allows TEISS users to display map features in conjunction with relevant emissions and activity data on a real-time basis. The TEISS GIS module includes a full set of tools for manipulation of any map created in the system. The WRAP EDMS could include a majority of this functionality in its GIS module to provide its users a complete internet GIS capability. However, since current web GIS capabilities are limited compared to desktop capabilities, the WRAP EDMS will not be able to implement all of the features of the TEISS GIS module.

Second, the TEISS has a flexible set of exporting functions to allow for multiple data export formats. The WRAP EDMS could include a comparable set of exporting features to accommodate the need of multiple formats for the system's users.

### **3.3.3 California Air Resources Board Emissions Inventory – CARBEI**

The California Air Resources Board maintains an emissions inventory (CARBEI) containing information on air emissions and their sources for the state of California. The CARBEI has a public website (<http://www.arb.ca.gov/emisinv/eib.htm>) where users can query the emissions database and produce reports based on their specific needs.

#### **3.3.3.1 System Details**

The CARBEI tracks five pollutants: NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, and CO. The pollutants are tracked for three sources types: point, area, and mobile sources. All data is tracked at the county level for all sources, and also individually for point sources. The data is submitted by local agencies in the California Air Resources Board's standard submission format, the California Emission Inventory Development and Reporting System (CEIDARS).

The CARBEI includes a QA/QC process that performs multiple levels of QA/QC checks. The first level consists of a validation of the format of the submitted data files, which ensures that the submitting entity supplied all data to CARBEI, in the expected format, and also identifies any errors with the submitted format. The second level of QA/QC checks includes checks of the data that is submitted to CARBEI. Data points are checked against acceptable data ranges to ensure the submitted data are accurate and reasonable.

The CARBEI includes standard summary reports broken down by source category, geographic location, and pollutant. The CARBEI also includes a data export feature to allow data to be extracted from the CARBEI database for inclusion in external systems.

All reporting features of the CARBEI are available to the public via the internet. The CARBEI user interface is easy to use and navigate for the user to reach the desired data.

### **3.3.3.2 Key System Elements**

The CARBEI has one key element that should be utilized in the WRAP EDMS. The CARBEI report interface is very easy to use and intuitive, making the data gathering process easy for the user. The WRAP EDMS could adopt this report functionality and design for the general data gathering capabilities of its system.

### **3.3.4 Colorado Department of Health Air Pollution Inventory – CAPI**

The Colorado Department of Health maintains an Air Pollution Inventory (CAPI) containing information on air emissions and their sources for the state of Colorado. The CAPI has a public website (<http://emaps.dphe.state.co.us/APInv/viewer.htm>) where users can query the emissions database and produce reports based on their specific needs. It should be noted that CAPI is not the Colorado primary emissions inventory system. It is included in this analysis because of its internet capabilities.

#### **3.3.4.1 System Details**

The CAPI tracks five pollutants: VOC, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, and CO. The pollutants are tracked for three source types: point, area, and mobile sources. All data is tracked at the county level for all sources, and also individually for point sources. The data is submitted by local agencies on a continuing basis.

The CAPI includes standard summary reports broken down by source category, geographic location, and pollutant.

The CAPI includes a fully functioning GIS module that provides multiple tools to visually display data. The CAPI includes several advanced GIS features including: pan, zoom, query layer information, ability to add/remove multiple layers of data, measure distances, buffer, print, and select map features by line, rectangle, or polygon. The CAPI GIS module includes several static layers of data, such as county and state boundaries, and various attainment area boundaries.

All reporting features of the CAPI are available to the public via the internet. The CAPI user interface is easy to use and navigate for the user to reach the desired data.

#### **3.3.4.2 Key System Elements**

The CAPI includes a functioning, internet-based GIS module. The CAPI GIS module includes a full set of tools for manipulation of any map created in the system. Although the CAPI does not have the capability of mapping data from the emissions database, it does represent a good example of internet-based GIS functionality. The WRAP EDMS could include this functionality in its GIS module to provide its users internet-based GIS capability.

### **3.3.5 Delaware Environmental Navigator – DEN**

The Delaware Department of Natural Resources and Environmental Control maintains a database of information for all aspects of environmental monitoring and control. The Delaware Environmental Navigator (DEN) has a public website (<http://www.dnrec.state.de.us/dnreceis/>) where users can query the database and produce reports based on their specific needs.

#### ***3.3.5.1 System Details***

At the air emissions level, the DEN tracks five pollutants: VOC, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, and CO. The pollutants are tracked for three source types: point, area, and mobile sources. All data is tracked at the county level for all sources, and also individually for point sources. The data is submitted by local agencies on a continuing basis.

The DEN includes a limited QA/QC process that performs quality checks of all submitted data.

The DEN includes standard summary reports broken down by source category, geographic location, and pollutant.

The DEN includes a fully functioning GIS module that provides multiple tools to display data geographically. The DEN includes several advanced GIS features including: pan, zoom, query layer information, ability to add/remove multiple layers of data, measure distances, print, and select map features by line, rectangle or polygon. The DEN GIS module includes several static layers of data, such as county, state and country boundaries, interstate and highway line features, and the ability to select and display data by geographical area.

All reporting features of the DEN are available to the public via the internet. The DEN user interface is easy to use and navigate to reach the desired data.

#### ***3.3.5.2 Key System Elements***

The DEN has a fully functioning, internet-based GIS module included in the system. This allows DEN users to display map features in conjunction with relevant emissions and activity data on a real-time basis. The DEN GIS module includes a full set of tools for manipulation of any map created in the system. The DEN was included in this comparison due to its advanced internet-based GIS functionality and its ability to map user defined data queried from the DEN database on a real time basis. The WRAP EDMS could include this functionality in its GIS module to provide its users internet-based GIS capability.

## **4.0 RECOMMENDATIONS**

### **4.1 Flow Chart of the WRAP EDMS**

Appendix G presents the flow chart of the WRAP EDMS that shows the information needs, from the emissions data submission to the report generations, data queries, graphic display, and GIS presentation. The sections below explain the different parts of this flow chart.

### **4.2 Point Source Module**

For point sources, at a minimum, the emissions data listed below should be submitted, stored, and tracked for each inventory. The data file should be organized into records for the submitting format. In the NIF Version 3, the point source file contains eight records with specific key fields represented by these emissions data (see Appendix E).

- 1) Inventory year
- 2) Inventory start date
- 3) Inventory end date
- 4) Inventory type
- 5) Country code
- 6) State and county FIPS code
- 7) Tribal code
- 8) Facility ID code
- 9) Point ID code
- 10) Process ID code
- 11) Stack ID code
- 12) Site name
- 13) Physical address
- 14) SCC code
- 15) Heat content (fuel) (annual average)
- 16) Ash content (fuel) (annual average)
- 17) Sulfur content (fuel) (annual average)
- 18) Pollutant code
- 19) Activity/throughput (annual)
- 20) Activity/throughput (daily)
- 21) Work weekday emissions
- 22) Annual emissions
- 23) Emission factor
- 24) Winter throughput (%)
- 25) Spring throughput (%)
- 26) Summer throughput (%)
- 27) Fall throughput (%)
- 28) Hours/day in operation
- 29) Start time (hour)
- 30) Day/week in operation
- 31) Weeks/year in operation

- 32) X stack coordinate (latitude)
- 33) Y stack coordinate (longitude)
- 34) Stack height
- 35) Stack diameter
- 36) Exit gas temperature
- 37) Exit gas velocity
- 38) Exit gas flow rate
- 39) SIC code
- 40) Design capacity
- 41) Maximum nameplate capacity
- 42) Primary control efficiency (%)
- 43) Secondary control efficiency (%)
- 44) Control device type
- 45) Rule effectiveness (%)

Emissions from point sources will be estimated by STL agencies using emission factors published in AP-42 (EPA, 1998) or from stack test data and submitted at the individual source level on an annual temporal resolution basis. According to the CERR, the minimum point source reporting thresholds are 100 tons per year (tpy) for VOC, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, and NH<sub>3</sub> and 1000 tpy for CO. Many states have different reporting thresholds tied to other state environmental regulations and would like to be able to retrieve data from the EDMS as they are submitted. Therefore, the WRAP EDMS will allow different point source cutoff level submissions and will check for these discrepancies in order to avoid double counting emissions.

### **4.3 Area Source Module**

Based on input and discussion, it appears that area sources represent all other stationary sources not included in the point source category, excluding fire and windblown dust sources. These sources also include open burning activities on residential, commercial, and industrial properties.

For area sources, at a minimum, the emissions data listed below should be submitted, stored, and tracked for each inventory. Similar to the point sources, the data file should be organized into records. The area source file contains five records in the NIF version 3 (see Appendix E).

- 1) Inventory year
- 2) Inventory start date
- 3) Inventory end date,
- 4) Inventory type
- 5) Country code
- 6) State and county FIPS code
- 7) Tribal code
- 8) SCC code
- 9) Emission factor
- 10) Activity/throughput level (annual)
- 11) Total capture/control efficiency (%)
- 12) Rule effectiveness (%)

- 13) Rule penetration (%)
- 14) Pollutant code
- 15) Summer/winter work weekday emissions
- 16) Annual emissions
- 17) Winter throughput (%)
- 18) Spring throughput (%)
- 19) Summer throughput (%)
- 20) Fall throughput (%)
- 21) Hours/day in operation
- 22) Days/week in operation
- 23) Weeks/year in operation

Emissions from area sources will be estimated by STL agencies using mostly emission factors published in AP-42 (EPA, 1998) and submitted at the county level on an annual temporal resolution basis. The area source definitions are different from STL to STL. For example, some STL define gas stations or dry cleaners as point sources while others do as area sources. Therefore, the WRAP EDMS will allow different source category submissions and will check for these discrepancies in order to avoid double counting emissions.

#### **4.4 Mobile Source Module**

Mobile sources are divided into two main categories: onroad and nonroad mobile sources. Onroad mobile sources are motor vehicles licensed for use on highways or roadways (i.e. automobiles, trucks, etc). Onroad mobile source emissions are the product of emission factors obtained through the execution of the latest EPA's MOBILE model (EPA, 2002) or the California EMFAC model (CARB, 2002) and activity levels represented by the vehicle mile traveled (VMT). Dust from paved and unpaved roads may be estimated by using either the method in AP-42, Section 11 (EPA, 1998) or the EPA's PART5 model (EPA, 1995).

Nonroad mobile sources are the other mobile sources represented for instance by construction equipment, lawn and garden equipment, snowmobiles, boats, trains, and airplanes. Their emissions can be estimated using the EPA's NONROAD model (EPA, 2000) and/or published emission factors, especially for boats and trains. Emissions of airplanes and associated ground support equipment and auxiliary power units are estimated using the Federal Aviation Administration (FAA) Emission and dispersion Modeling System model (FAA, 2002). It is not anticipated that the WRAP EDMS will contain these models.

Most mobile emissions will be submitted at the county level on an annual temporal resolution basis. However, many mobile source emissions data are seasonal in nature. Therefore, the WRAP EDMS may store applicable seasonal mobile emissions data as well. For unsubmitted and/or missing mobile source emissions data for a given area, the WRAP EDMS DBA will estimate the inventories using available mobile emissions models and area-specific data or national average data. These inventories will be submitted to STL agencies for review and approval before inclusion in the final database.

For mobile sources, the emissions data listed below should be submitted, stored, and tracked for each inventory. Similar to the point sources, the data file should be organized into records. The onroad and nonroad mobile source files contain three and five records respectively in the NIF version 3 (see Appendix E).

For on-road mobile sources,

- 1) Inventory year
- 2) Inventory start date
- 3) Inventory end date
- 4) Inventory type
- 5) Country code
- 6) State and county FIPS code
- 7) Tribal code
- 8) SCC code
- 9) Emission factor
- 10) Activity (VMT by roadway class)
- 11) Pollutant code
- 12) Summer/winter work weekday emissions
- 13) Annual emission
- 14) Refueling emissions classification

For non-road mobile sources,

- 1) Inventory year
- 2) Inventory start date
- 3) Inventory end date
- 4) Inventory type
- 5) Country code
- 6) State and county FIPS code
- 7) Tribal code
- 8) SCC code
- 9) Emission factor
- 10) Activity/throughput level (annual)
- 11) Total capture/control efficiency (%)
- 12) Rule effectiveness (%)
- 13) Rule penetration (%)
- 14) Pollutant code
- 15) Summer/winter work weekday emissions
- 16) Annual emissions
- 17) Winter throughput (%)
- 18) Spring throughput (%)
- 19) Summer throughput (%)
- 20) Fall throughput (%)
- 21) Hours/day in operation
- 22) Days/week in operation

23) Weeks/year in operation

#### **4.5 Biogenic Source Module**

The latest EPA's Biogenic Emissions Inventory System (BEIS) model (EPA, 1998) will be used to generate the region-wide biogenic emissions using activity data submitted by STL agencies and other surrogate land use and meteorological data. The emission inventories will then be submitted to STL agencies for review and approval before inclusion in the final database. The reporting spatial resolution will be the county level and the temporal resolution will be annual for the biogenic emissions data in Phase I. In phase II, hourly, daily, or seasonal temporal resolutions may be tracked. The biogenic emissions are currently being generated at RMC on a 36-km grid system for each hour. Therefore, they will need to be converted to a county level and aggregate on an annual temporal resolution basis before being sent to STL agencies for review and subsequent inclusion in the WRAP EDMS.

For biogenic sources, at a minimum, the emissions data listed below should be submitted, stored, and tracked for each inventory. Similar to the point sources, the data file should be organized into records. The biogenic source file contains two records in the NIF version 3 (see Appendix E).

- 1) Inventory year
- 2) Inventory start date
- 3) Inventory end date
- 4) Inventory type
- 5) Country code
- 6) State and county FIPS code
- 7) Tribal code
- 8) SCC code
- 9) Pollutant code
- 10) Summer/winter work weekday emissions
- 11) Annual emissions

#### **4.6 Windblown Dust Source Module**

Windblown dust emissions will be generated region-wide through modeling. The emission inventories will then be submitted to STL agencies for review and approval before inclusion in the final database. The spatial resolution will be the county level and the temporal resolution will be annual for the windblown dust source data in Phase I. In phase II, hourly, daily, or seasonal temporal resolutions may be tracked. The dust emissions ( $PM_{10}$  and  $PM_{2.5}$ ) are currently being estimated using wind data as emissions per grid square. Therefore they will need to be converted to a county level before being sent to STL agencies for review and subsequent inclusion in the WRAP EDMS.

For windblown dust sources, at a minimum, the emissions data listed below should be submitted, stored, and tracked for each inventory. Windblown dust source is not included in the NEI as a

separate source category. Therefore, the data file needs to be created and the records defined. A definition based on the NIF biogenic source file should suffice.

- 1) Inventory year
- 2) Inventory start date
- 3) Inventory end date
- 4) Inventory type
- 5) Country code
- 6) State and county FIPS code
- 7) Tribal code
- 8) SCC code
- 9) Pollutant code
- 10) Summer/winter work weekday emissions
- 11) Annual emissions
- 12) Natural or anthropogenic classification

#### **4.7 Fire Source Module**

There are four types of fire emissions sources - wildfire, prescribed fire, wildland fire use, and agricultural burning - that will be included in the fire source module of the WRAP EDMS. It should be noted that wildfire, prescribed fire, wildland fire use include rangeland. Fire sources such as open burning activities on residential, commercial, and industrial properties will be included in the area source module. The WRAP Fire Tracking System (FTS) (WRAP, 2001) identified seven essential data (9 – 17) that will provide the basis for calculating the emissions for fire through the use of an emissions calculation mechanism, such as the WRAP emissions inventory system, to integrate the appropriate emissions factors and emission calculation techniques. The FTS also identified optional data (18 – 21) that are equally important in calculating fire emissions. Note that for fire sources, the WRAP EDMS will calculate the emissions. However, some STL agencies may estimate fire emissions themselves. These emissions will be submitted by the STL agencies with all the activity and surrogate data used for the estimation.

For fire sources, at a minimum, the emissions data listed below should be submitted, stored, tracked, and also used to calculate fire emissions when necessary. In the NEI, fire sources are contained in the area source category. Therefore, a data file which records are similar to the NIF area source file may define the fire source file.

- 1) Inventory year
- 2) Inventory start date
- 3) Inventory end date
- 4) Inventory type
- 5) County code
- 6) State and county FIPS code
- 7) Tribal code
- 8) SCC code
- 9) Date of burn

- 10) Duration of burn
- 11) Burn location latitude
- 12) Burn location longitude
- 13) Area of burn
- 14) Fuel type
- 15) Pre-burn fuel loading
- 16) Type of burn
- 17) Anthropogenic or natural classification
- 18) Daily tracking components
- 19) Fuel consumption
- 20) Non-burning techniques
- 21) Additional fire tracking information
- 22) Pollutant code
- 23) Emission factor
- 24) Daily emissions
- 25) Annual emissions

#### **4.8. Standard Reports and Queries**

The EDMS should have the capability to produce the following standard reports in tabular and simple plots (i.e. bar graph and pie chart) formats and allow queries of the same information including presentation in GIS format.

- A summary report of the annual WRAP emission inventory, compiled at the county and reservation levels and totaled for each state, tribe, and the WRAP region, for all pollutants, broken down by point, area, mobile, fire, biogenic, and windblown dust source categories, and by summed total emissions for all six source categories.
- A summary report of the annual WRAP emissions from the stationary point sources in each county and reservation and the stationary point sources for each state, tribe and the entire region (broken down by plant name), for each pollutant.
- A summary report of the annual WRAP emissions from the stationary point sources in each county and reservation and the stationary point sources for each state, tribe and the entire region (broken down by SCC code), for each pollutant.
- A summary report of the annual WRAP emissions from the area sources in each county and reservation and the area sources for each state, tribe and the entire region (broken down by SCC code), for each pollutant.
- A summary report of the annual WRAP emissions from the “Top 10” stationary point sources in each county and reservation and the “Top 10” stationary point sources for each state, tribe and the entire region (broken down by plant name), for each pollutant.
- A summary report of the annual WRAP emissions from the “Top 10” stationary point sources in each county and reservation and the “Top 10” stationary point sources for each state, tribe and the entire region (broken down by SCC code), for each pollutant.
- A summary report of the annual WRAP emissions from the “Top 10” area sources in each county and reservation and the “Top 10” area sources for each state, tribe and the entire region (broken down by SCC code), for each pollutant.

- A summary report of the annual WRAP emissions from on-road mobile sources in each county and reservation and on-road mobile sources for each state, tribe and the entire region (broken down by the sixteen (16) mobile source categories), for each pollutant and dust from paved and unpaved road.
- A summary report of the annual WRAP emissions from non-road mobile sources in each county and reservation and non-road mobile sources for each state, tribe, and the entire region (broken down by SCC code), for each pollutant.
- A summary report of the annual WRAP emissions from fire sources in each county and reservation and fire sources for each state, tribe, and the entire region (broken down by the 3 fire categories (wildfire, prescribed wild land burning, and agricultural burning activities), for each pollutant.
- A summary report of the annual WRAP emissions from biogenic sources in each county and reservation and biogenic sources for each state, tribe, and the entire region (broken down by emission source name).
- Data reports in the NEI Input Format Version 3.0 (NIF V3.0) for submittal to the EPA under the CERR.
- For stationary point sources, data reports for all emission points on site by text description name and by Stack ID, for NEI file format stack parameters (STKHGT, STKDIAM, STKTEMP, STKFLOW, STKVEL), production rates (BOILCAP, CAP\_UNITS, THRUPUT, MAXRATE, NETDC), fuel parameters (HEATCON, SULFCON, ASHCON), standard industrial classification code (SIC), location (LATC, LONG), and emission controls ("pollutant"\_CE, "pollutant"\_CPRI, "pollutant"\_CSEC).
- For stationary point sources, data reports for all emission points on site by text description name and by Stack ID, for actual emission rates of each pollutant, on an annual (tpy) and on a short term (pounds per hour) basis. This emission data will be summed for a cumulative total of emissions from each stationary point source.
- In addition to these standard reports, the EDMS will produce regional emission model (SMOKE)-ready emissions input files for the regional visibility modeling efforts.

#### **4.9. Special Section 309 Tracking**

Section 309 of the RHR requires that the first SIP be submitted by December 31, 2003 and that SIPs must be effective until December 2018. Section 309 also specifically requires comprehensive emissions tracking and reporting for the clean air corridors (CAC), stationary SO<sub>2</sub> sources, mobile sources, fire sources, and road dust based on annual emissions.

##### **4.9.1 Clean Air Corridors (CAC)**

The preamble of the RHR defines a CAC as “a region that generally brings clean air to a receptor region”. The preamble also says, “the requirement to track emissions will enable states to quickly determine if changes in patterns of emissions will reduce the number of clean air days (defined as the average of the 20% clearest days) in any of the 16 Class I areas.” The actual requirements state that the Section 309 SIP/TIP must describe and provide for implementation of comprehensive emission tracking strategies for CAC to ensure that the visibility does not degrade on the least-impaired days at any of the 16 Class I areas. The strategy must include:

- An identification of CAC.
- Within areas that are CAC, an identification of patterns of growth or specific sites of growth that could cause, or are causing, significant emissions increases that could have, or are having, visibility impairment at one or more of the 16 Class I areas.
- In areas outside of CAC, an identification of significant emissions growth that could begin, or is beginning, to impair the quality of air in the corridor and thereby lead to visibility degradation for the least-impaired days in one or more of the 16 Class I areas.
- If impairment of air quality in CAC is identified, an analysis of the effects of increased emissions, including provisions for the identification of the need for additional emission reduction measures, and implementation of the additional measures where necessary.
- A determination of whether other clean air corridors exist for any of the 16 Class I areas. For any such CAC, an identification of the necessary measures to protect against future degradation of air quality in any of the 16 Class I areas.

WRAP identified one CAC as shown in Appendix H. Using the most recent state emission inventories available through the WRAP EDMS, WRAP will produce a report for each five-year implementation plan revision (2008, 2013, and 2018) on the current and projected emissions in the CAC and in areas outside the corridor and compare these emissions to a 1996 baseline emissions.

WRAP has examined patterns of growth in the CAC and found that they are not causing significant emission increases that could have or are having visibility impacts at one or more of the 16 Class I areas. Nor, at this time, are such emission increases expected during the first planning period (2003-2018). WRAP also has examined emissions growth in areas outside the corridor and found that significant emissions growth is not occurring that could begin or is beginning to impair the quality of the air in the corridor and thereby lead to visibility degradation for the least impaired days in one or more of the 16 Class I areas.

Since impairment of air quality in clean air corridors has not been identified, WRAP finds no requirement under for further visibility impact analysis or additional emission reduction measures until at least the next SIP revision (2008). WRAP finds no other clean air corridors beyond the corridor identified in Appendix H.

Consequently, the EDMS should have the capability to produce the following special reports in tabular and simple plots (i.e. bar graph and pie chart) formats and allow queries of the same information including presentation in GIS format, in addition to the standard reports.

- A summary report of the annual summed total emissions for all six source categories and all of the pollutants by county/state and tribal lands, as well as for the entire CAC.
- A summary report of the annual summed total emissions for all six source categories and all of the pollutants for the same types of political boundaries surrounding the CAC.
- A summary report of the comparison of the annual summed total emissions for all six source categories and all of the pollutants for the same types of political boundaries, as well as the entire CAC and the corresponding base year total emissions.

#### 4.9.2 Pre-Trigger SO<sub>2</sub> Annex

The SO<sub>2</sub> Annex program, as proposed by WRAP and adopted by EPA, requires the tracking of SO<sub>2</sub> emissions from eligible stationary sources within states or tribal reservations participating in Section 309, to determine if the regional SO<sub>2</sub> emissions cap has been exceeded. This is known as “pre-trigger” tracking. Beginning with the 2003 calendar year and continuing through 2018, each state and tribe participating in the program will submit an annual SO<sub>2</sub> emissions report to the WRAP EDMS for the sources covered by the program. These annual reports will contain the following information:

- Identification and explanation for new/additional SO<sub>2</sub> sources which emissions are greater than 100 tpy that were not contained in the previous year’s emissions report.
- Explanation for sources shut down or removed from the previous year’s emissions report.
- Explanation for emissions variations at any covered source that exceeds +/- 20% from the previous year.
- Identification and explanation of new emissions reporting methods at any source.

WRAP will compile the annual emissions reports submitted by the states and tribes participating in the program into a regional emission report for SO<sub>2</sub> using the WRAP EDMS. By December 31 of the year following the applicable compliance year, WRAP will prepare a regional emission report that will include the following information:

- Summary of regional SO<sub>2</sub> emissions (tpy).
- Identification of any paper emission increases and decreases that have occurred due to changes in emission inventory techniques since the last SIP revision for the regional haze SIP. The report will contain a running regional total, as well as supporting documentation identifying the specific changes that have occurred at individual sources.
- Average emissions for the last three years (if applicable) for comparison to the regional milestone.
- Regional milestone for the compliance period.
- Draft determination that the milestone has either been met, or has been exceeded thereby triggering the backstop trading program.

Consequently, The EDMS should have the capability to produce the following special reports in tabular and simple plots (i.e. bar graph and pie chart) formats and allow queries of the same information including presentation in GIS format, in addition to the standard reports.

- A summary report of the annual WRAP emissions from the stationary sources emitting more than 100 tpy of SO<sub>2</sub> in the base year for each state, tribe and the entire region.
- A summary report of the new stationary sources emitting more than 100 tpy of SO<sub>2</sub> that were not contained in the previous year’s inventory for each state, tribe and the entire region.
- A summary report of the stationary sources emitting more than 100 tpy of SO<sub>2</sub> that are retired compared to the previous year’s inventory for each state, tribe and the entire region.

- A summary report of the regional average SO<sub>2</sub> emissions from stationary sources emitting more than 100 tpy of SO<sub>2</sub> for the last three years and comparison to the regional milestone for the compliance period.
- A summary report of the stationary sources emitting more than 100 tpy of SO<sub>2</sub> which emissions exceed +/- 20% compared to the previous year's inventory for each state, tribe and the entire region.
- A summary report identifying all the stationary sources emitting more than 100 tpy of SO<sub>2</sub> that choose to opt in the program for each state, tribe and the entire region.
- A summary report identifying all the stationary sources emitting more than 100 tpy of SO<sub>2</sub> that were not included in the base year for each state, tribe and the entire region.

### 4.9.3 Mobile Emissions

For mobile sources, the SIP/TIP submissions must provide for statewide inventories of on-road and non-road mobile source emissions of VOC, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>2.5</sub>, EC, OC, and paved and unpaved road dust for the years 2003, 2008, 2013, and 2018. The inventories must demonstrate a continuous decline in total mobile source emissions for the aforementioned pollutants, evaluated separately. This means that the statewide mobile source emissions of each pollutant in 2008, 2013, and 2018 must be less than the estimated emissions of that pollutant for the previous period.

Consequently, the EDMS should have the capability to produce the following special report in tabular and simple plots (i.e. bar graph and pie chart) formats and allow queries of the same information including presentation in GIS format, in addition to the standard reports.

- A summary report of the comparison of annual WRAP total (on-road plus nonroad) emissions from the mobile sources (VOC, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>2.5</sub>, EC, OC, and paved and unpaved road dust) for each state, tribe and the entire region and the corresponding previous period total emissions, for each pollutant.

### 4.9.3 Fire Emissions

For fire emissions, Section 309 of the RHR specifically calls for a statewide inventory and emissions tracking system (spatial and temporal) of VOC, NO<sub>x</sub>, EC, OC, and PM<sub>2.5</sub> emissions from fire. The WRAP inventory will add SO<sub>2</sub>, PM<sub>10</sub>, CO, and NH<sub>3</sub> emissions.

Under Section 309, states and tribes must identify a method or a timeline to develop a method to track fire activity data and calculate the resulting required emissions inventory in their SIP/TIP. Tracking of fire activity data and calculation of the resulting emissions through the WRAP EDMS will provide information critical to the successful implementation of other requirements under Section, including the development, adoption, and implementation of enhanced smoke management programs, the establishment of annual emission goals, and future projections of fire emissions.

The WRAP EDMS will track activity data as reported by states and tribes participating in Section 309, as well as the same type of data provided by other WRAP region state, tribal, and

local air agencies, and federal/state/private sources using prescribed and/or agricultural burning techniques. The WRAP EDMS will calculate the resulting emissions for fire source types including prescribed fire, wildfire, wildland fire use, and agricultural burning.

The EDMS should have the capability to produce a special report in tabular and simple plots (i.e. bar graph and pie chart) formats and allow queries of the same information including presentation in GIS format in the standard report style presented in Section 3.8 of this report.

#### **4.10 GIS Module**

GIS provides users with the ability to display and analyze data that is related to a geographic location. GIS provides a means for an organization to display data that is easily read and understood. The WRAP EDMS should include a fully functioning GIS module that provides multiple tools to display data over the internet. The inclusion of a GIS module will provide a means for users to select data that is of importance to them and display the data in a fashion that is easily understood.

During Phase I of development, the WRAP EDMS should include the following GIS Functionality.

- Pan and zoom
- Query layer information
- Ability to add/remove multiple layers of data
- Point and click
- Measure distances
- Buffer
- Print – multiple sizes of maps
- Select map features by line, rectangle or polygon

Phase II development of the WRAP EDMS could include some of the following additional functionality.

- Export selected maps shape files
- Generate polygons/layers from coordinates stored in the WRAP EDMS (e.g. create polygons for fire burn areas)

The WRAP EDMS GIS module should include the following layers of data for Phase I development.

Static layers

- County, state and country polygons
- Tribal reservation polygons
- Metropolitan statistical areas polygons
- Nonattainment area polygons
- Class I areas polygons

- Interstate and highway line features
- Other roadways and railroad line features
- Bodies of water polygons
- Census data polygons
- Other federal land polygons (i.e. national parks, monuments, forest, and refuges)
- CAC polygons
- International area polygons
- WRAP modeling domain grid system

#### Dynamic/Data driven layers

- Select and display emissions sources and associated emissions levels by geographical area.

### 4.11 DBA Module

All major applications and systems include an administrative section or module that allows the application administrator(s) to perform general system maintenance as well as application specific system maintenance. These maintenance routines consist of tasks that are routinely performed by the application or system administrator(s) and can easily be automated through a graphical user interface. Often times there are tasks that administrators need to perform that cannot easily be automated, due to the complexity or changing nature of the task, and would not be included in the administrative module of the application.

The WRAP EDMS will require a DBA Module, which will provide the necessary functionality required to perform several administrative tasks. During Phase I of development, the WRAP EDMS should include the following DBA Functionality.

- User account maintenance – maintain the list and permissions for users of the WRAP EDMS.
- Lookup table maintenance (unit conversions, threshold values, etc.) – maintain the multiple lookup tables and associated data that will be included in the WRAP EDMS.
- Versioning/maintenance of submitted data – ability to version submitted data and determine current version of all data.
- Data gap filling triggered from a QA/QC check, following specific methods that will be developed by WRAP.
- International data maintenance – maintain the tables and data for all international data necessary for the WRAP EDMS.
- Opt-in options for individual states, tribes, and sources – maintain list of states and tribes with associated emissions sources that decide to opt-in for Sections 308 and 309 tracking, after 2003.
- Others – other DBA module functionality requirements as determined necessary.

During Phase II development, the WRAP EDMS should include the following DBA Functionality.

- Data warehousing/archiving – ability to move historical data out of the production database and into a WRAP data warehouse.
- Historical data retrieval – ability to generate reports and data sets from the WRAP data warehouse.

#### 4.12 QA/QC Module

The WRAP EDMS will include a QA/QC module to perform two levels of QA/QC. The QA/QC protocol will be similar to that of NEI with some modifications (see Appendix F for the NEI QA/QC process). The first level of QA/QC should include a validation of the format of the submitted data files at the submission point of entry. This would ensure that the submitting entity supplied all data to the WRAP EDMS in the expected format and also identify any errors. The second level of QA/QC should consist of checks of the data that was submitted to WRAP. This should include checking reference values and acceptable data ranges for specific data points.

The WRAP EDMS QA/QC module should perform the following types of format checks.

- Does the file conform to the format specification? - The initial checks performed on each submitted data set will verify that the file format is correct, and therefore readable for further processing (e.g., field widths, begin/end position, data types).
- Are mandatory data elements reported? - The presence or absence of mandatory data elements will be confirmed. Some of the mandatory data fields are the primary keys (i.e. FIPS codes and SCC Codes) in each record that help relate and maintain the individual records together in a file for subsequent processing.
- Does the data set contain what the STL agency said they are submitting? - The data in the file will be compared to the Inventory Submittal Form (ISF) that was provided with the file to verify the noted and intended coverage for geographic area, pollutants, source categories, and temporal information.

WRAP will keep a log of errors and problems encountered with each of the data submissions, and will provide those to the STL agency when communicating with the agency.

The WRAP EDMS QA/QC for data content will consist of two areas of QA/QC. First, the data will be checked for completeness, ensuring that all data exists for all sources and geographic areas. Second, the data integrity will be checked, ensuring that supplied values are within acceptable ranges and all codes are valid. The QA/QC module should perform the following types of data content checks for completeness.

- Add records to fill in missing facilities or source categories, or to fill in for missing geographic areas (e.g., where data were not reported for entire counties).
- Add, or solve for, data elements missing in existing records.

Additionally, the QA/QC module will perform the following data augmentation processes:

- Calculate EC and OC emissions.

- Aggregate dust and biogenic source data from the supplied grid and hourly levels to county/reservation and annual levels.
- Modify county data to exclude sources and emissions from tribal reservations that are within the county's boundaries.

The QA/QC module should perform the following types of data integrity checks.

- Conditional fields - fields required by other fields in the same table. For example, if there is a PCT Capture Efficiency in the Control Equipment (CE) table, then there should also be a Primary Device Type in the CE Table.
- Acceptable codes - the Pollutant Code (and all acceptable codes) should be consistent.
- Numeric values in acceptable range - For example, the annual average days per week in the Emission Point (EP) table should be less than seven.
- Inter-File Format - fields required by other fields in different tables. If there is an Emission Record in the Emission (EM) table, then there should be an associated activity record in the Activity Code (AC) table.
- Inter-source relationships
- Inter-pollutant relationships
- Advance point source diagnostic – check of largest sources, out of range stacks, stack location.

## 5.0 CONCLUSIONS

Under contract with the WRAP EF, EA performed an EDMS needs assessment that included two interview workshops, a web-based questionnaire, and an evaluation of selected existing systems. Five existing database management systems were evaluated and compared to the conceptual WRAP EDMS developed from the findings of the workshops and web-based questionnaire.

The workshops and questionnaire results indicated that the WRAP EDMS should be used as the repository of WRAP regional emissions data, and as a tool that can help in the implementation of the emissions tracking and reporting requirements of the RHR. The WRAP EDMS will be able to track all the visibility-impairing pollutants. The emissions data will primarily be submitted by STL agencies in an EPA-compliant format according to an open submittal process. Furthermore, the WRAP EDMS will contain six major sources representing the emissions sources: point, area, mobile, fire, biogenic, and windblown dust sources in addition to a QA/QC module, a GIS module, and a DBA module. Finally, the WRAP EDMS will produce user-specified standard and RHR-special reports and will allow data queries and graphical display, and presentation of this information in GIS format.

The results of the comparative analysis showed that the conceptual WRAP EDMS has a unique set of requirements that are not fully implemented in any existing EDMS. Therefore, a new individual EDMS needs to be developed to meet the requirements for the conceptual WRAP EDMS. Also, this new system could utilize some of the features incorporated in several of the existing systems to accomplish some of the WRAP EDMS requirements.

## 6.0 REFERENCES

- California Air Resources Board (CARB), EMFAC 2002 Vehicle Emission Model, 2002.
- Code of Federal Regulation (CFR), Chapter 40, Part 51.
- Code of Federal Regulation (CFR), Chapter 40, Part 49.
- Federal Aviation Administration (FAA), Emission and Dispersion Modeling System (EDMS) Version 4.1, 2002.
- Federal Register (FR), Volume 64, PP 35756.
- Federal Register (FR), Volume 67, PP 30439.
- Federal Register (FR), Volume 67, PP 7263-64.
- Federal Register (FR), Volume 67, PP 39602-16.
- Grand Canyon Visibility Transport Commission (GCVTC), Recommendations for Improving Western Vistas, Report to the EPA, June 10, 1996.
- MCNC, Sparse Matrix Operator Kernel Emissions (SMOKE) Modeling System, 1999
- Pechan, Draft RPO Data Exchange Protocol, 2003.
- US Environmental Protection Agency (EPA), User's Guide to Mobile6.1 and Mobile6.2: Mobile source Emission Factor Model, 2002.
- US Environmental Protection Agency (EPA), Draft User's Guide to PART5: A Program for Calculating Particle Emissions from Motor Vehicles, 1995.
- US Environmental Protection Agency (EPA), Draft NONROAD Model for 2007 HD Highway Rulemaking, June 2000.
- US Environmental Protection Agency (EPA), Biogenic Emission Inventory System Version 2.3, 1998.
- US Environmental Protection Agency (EPA), Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, 1998.
- Western Regional Air Partnership (WRAP), Fire Tracking System Policy, 2002.

## Appendix B:

### Calculating and Tracking Fire Emissions Inventories

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In the WRAP region, fire emissions are distributed across the landscape, vary under the influence of multiple climatological factors, are subject to various management techniques and policies, and consist of both natural and manmade emissions. Emissions source subcategories of interest for WRAP fire emission inventories are defined as agricultural (Ag) fire, wildland prescribed (Rx) forest and range fire, and wildland (Wx) wildfire. By contrast, emissions from events such as structure fires, et cetera, are treated as area sources in other WRAP emissions inventories.

Because Ag, Rx, and Wx fires often occur within or close by mandatory federal Class I areas, as well as the possibility that the resulting emissions will be transported hundreds to thousands of kilometers, WRAP region fire emissions inventories are important for several reasons:

- To track emissions for regulatory fire emissions management programs adopted under §309 of the federal Regional Haze Rule, based on policies adopted by the WRAP;
- To understand the impact of fire emissions on IMPROVE monitoring data used to track reasonable progress under the federal Regional Haze Rule;
- As model-ready inputs to computer simulations of regional haze air quality; and
- As a regulatory planning tool, such that existing emissions records support state and tribal regulatory programs to demonstrate reasonable progress toward the national visibility goal, by estimating future Ag, Rx, and Wx fire emissions.

Management of Ag, Rx, and Wx fire activity data and records used to calculate emissions is not uniformly required or centralized, nor are regulatory fire emissions models specified or approved by EPA. The WRAP has adopted a Fire Tracking System policy, available on the WRAP website, which identifies the needed activity data for proper calculation of fire emissions. With adequate activity data, temporally- and spatially-representative WRAP region fire emissions can be calculated using EPA-suggested emissions factors, which continue to improve as the fire emissions research community publishes improved factors. Given the variation in activity data likely to be available to calculate useful fire emissions inventories, flexibility and creativity will be necessary to prepare robust estimates of fire emissions for WRAP analyses.

Sources of fire activity record data include the following:

- State/tribe/local air regulatory agencies;
- Federal/state/local/private/corporate land manager/owner; and
- County/city/municipality/for-hire fire department.

Comments on the associated fire activity record formats, from the list of needed fire data and formats in the **Needs Assessment for Evaluation and Design of an Emissions Data Reporting, Management, and Tracking System Final Report**, are described next:

1. Inventory Year
2. Inventory Start Date
3. Inventory End Date
4. Inventory Type
5. County Code – Assume the location data will automatically set this up and no manual entry will be required.
6. State and county FIPS code - Assume the location data will automatically set this up and no manual entry will be required.
7. Tribal Code - Assume the location data will automatically set this up and no manual entry will be required.
8. SCC code – needs review to insure there is adequate definition.
9. Date of burn – Fire Tracking System policy:  
<http://wrapair.org/forums/fejf/documents/fts/WRAPFTSPolicy.pdf> emphasizes entry by individual day.
10. Duration of burn – used only if individual day-to-day data is unavailable. This probably needs breaking into a start date and control date for most agencies. Many records are not accurate on control in the 0-100 acre classes. Above that number, the accuracy is better. Start time is frequently available from the federal/state records.
11. Burn Location Latitude (see 12)
12. Burn Location Longitude – This will come in a variety of formats ranging from legal (Township, Range, Section, ¼ Section) to UTM to Latitude/Latitude. Note that some tribal areas have tribal defined systems (Navajo). The system should provide for conversion capability between the systems listed above. Potentially, perimeter data (shape files) may be provided to cover location. As the current approach to modeling fire is using a Point Source format (not area source as specified in the **Needs Assessment for Evaluation and Design of an Emissions Data Reporting, Management, and Tracking System Final Report**), the system may need to create an array of points within the area boundary which will be dependent on the grid scale that is needed in the model-ready files. Example: A fire is defined as three entire Township and Ranges (an area defined as 6 miles by 18 miles) in a grid pattern of 12 km x 12 km would result in several grids for the emissions. A centroid would need to be calculated if an area is entered.
13. Area of burn – blackened acres. If an area is provided, the percent black may also be provided, typically in acres.
14. Type of Fuel - Must range from natural to activity fuels. Would expect answer ranging from no entry to complex ecosystems that are percentages of fuel types. Species type to logging slash. (Expect entries in the general terms of timber, brush, and grass.) As the location will be provided (mandatory field), perhaps the most current fuel type map could provide an overlay that would fill in the needed fuel type with a default value, which could then be over written by choice.
15. Pre-burn fuel loading – Could be default designed from fuel type map (current NFDRS augmented by WRAP crown and duff/litter numbers, or a new Fuel Characteristic Class map – see LANDFIRE Project [www.landfire.gov](http://www.landfire.gov)). This will probably need a checking capability as one would not want a 100-ton/acre fuel load for a grass fire. The pile dimensions and characteristics would need to be possible to enter as well (examples of accomplishment forms can be provided). Entry may be gross tons consumed as well,

allowing differentiation between pre and post fire consumption will be needed. Default values for agricultural types will need to be developed.

16. Type of burn – If the SCC codes are robust enough, this field may be redundant. There may need to be coordination with EPA to address adequacy of SCC codes for fire. SCC should allow for definition of fire type (wildfire, wildland fire use, agricultural burn, prescribed fire) and coarse type such as prescribed fire (activity, piles, broadcast, windrow, natural fuels).
17. Categorization of Natural or Anthropogenic – These binary options or information that would allow this to be determined.
18. Tracking components – Contact Information for record or further information.
19. Fuel Consumption – An assumption regime would need establishing depending on the availability of the previous fields. Could allow choice of calculate a default or a percent.
20. Acres treated using non-burning alternatives – would need area capability and a field to enter type of technique used. Would preclude burn acres from being entered.
21. Additional Fire Tracking Information - a) fuel moisture, b) purpose of burn, c) plume rise, d) burn identification code, e) emission reduction techniques used, and f) irrigated/non-irrigated.