

**MEMORANDUM****WRAP FIRE EMISSIONS TRACKING SYSTEM – 2011
WORKPLAN**

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PROJECT NO.: 178-12
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Introduction**FETS System Description**

The WRAP's Fire Emissions Tracking System (FETS) is a web-enabled database for planned and unplanned fire events. It serves as a planning tool for daily smoke management coordination and technically processes and stores highly resolved fire emissions data for retrospective analyses such as National Ambient Air Quality Standards (NAAQS) and regional haze air quality modeling.

The FETS was developed and became operable in mid-2007. At its most basic level, the FETS accepts and serves as a stable repository for fire activity (five types of fire consistent with WRAP Policy) and emissions data as provided by states, Tribes, and Federal Land Managers (FLM) within the WRAP region. Data submitted on a near real-time basis are made available for regional coordination purposes for Smoke Management Programs (SMP). Several methods are available for submitting data to the FETS, including Web Services, FTP, and manual entry on the website.

Currently, emission estimates for fires are derived from three sources:

- Provided by the SMP user when the incident data is uploaded;
- Calculated using a modified version of the EPA's AP-42 emission factors with fuels data and loading based on [FCCS 1.1](#);
- The CONSUME3 consumption and emissions model is run on all accomplished acres with additional input from FCCS1.1 and interpolated fuel moisture data from the Weather Information Management System ([WIMS](#)) [[example dataset](#)].

All fire activity data stored in the FETS are viewable as point locations from a Web-based [map tool](#). This allows users to access individual event data (metadata and emission estimates) and to select data across a period of time or bounded geographically (county or state). These temporal and spatial groupings create an output of summed events, acres and emissions. The user can also control additional layers on the map - Tribal lands, satellite-based fire detections from NOAA's Hazard Mapping System ([HMS](#)), and Mandatory Class I areas.

Recent Development

In 2010, several data sources and historical data sets from WRAP member states (no additional Tribal data sources were added) were added to the FETS and several features were introduced.. Several supporting data sets were added, including NOAA's HMS for use with the FETS map tool, hourly [GOES](#) 4km images for the western United States for daily animations (not yet implemented), and radar-observed precipitation data to support emissions calculations (not yet implemented).

The most substantial change was the addition of tools to the FETS website to aid WRAP states and tribes with reporting their fire data stored in the FETS to the EPA's 2008 NEI. Tools included a web-based mapping environment to manually analyze and reconcile FETS data with a satellite-derived 'preliminary' fire inventory produced by the EPA and an export tool to format chosen data for submittal to the NEI.

FETS Development in 2011

Task 1: Operations and Maintenance

Ongoing and critical aspects of the FETS project include maintaining the servers, supporting new and existing users, and other tasks to operate a viable system. One specific maintenance item is re-locating the FETS database server to a more stable environment.

Identified operations and maintenance efforts include:

- Re-locate the database server to Air Sciences Inc.
- Help new data providers add data streams to the FETS; support users with problems and changes to existing data streams.
- FETS Project Status Calls. Conference calls occur once every 6-8 weeks to report on workplan progress, issues, and upcoming events.
- General system maintenance and user support.

Deliverables

- Bi-monthly status report documents for the FETS Project Team, as part of status conference calls, outlining remaining budget and progress on tasks.
- Updates to various sections of the FETS website as new materials and products become available, such as the News and Events section of the homepage, and the Resources and Methods sections outlining relevant documents and technical methods.

Task 2: Inventory Calculation and Reporting

This task will develop one or more methods/formats for exporting emission inventories to best serve the intended uses of the data.

Identified subtasks include:

- Develop a common export format for modelers, such as [NetCDF](#).
- Develop a GIS-based export format for planners, such as [ESRI](#) shapefile or geodatabase.

2011 FETS Task Matrix

Tasks	Task included in JFSP Proposal	2011 FETS Tasks	
Task 1: Operations and Maintenance			\$ 23,446.50
Re-locate the database server to Air Sciences Inc.	No	Yes	
Help new data providers add data streams to the FETS; support users with problems and changes to existing data streams.	No	Yes	
FETS Project Status Calls	No	Yes	
General system maintenance and user support.	No	Yes	
Task 2: Inventory Calculation and Reporting			\$ 6,553.50
Air Quality Planning Emission Inventories			
Fire Activity: Enhance geographic coverage and daily resolution of reported data.			
Link the SMARTFIRE data stream to the FETS for data augmentation and gap-filling purposes.	Yes	No	
Build a map-based rule set to filter SMARTFIRE data: exclude data in areas with complete coverage for all fire types, and assign a burn classification based on the five (four) recognized fire types in the FETS (WF,RX,AG,NFR).	Yes	No	
Upload MTBS fire perimeters to the FETS database. Perform spatial QA/QC on large wildfires using the MTBS dataset to improve the accuracy of SMARTFIRE.	Yes	No	
Fire Science: Develop a consistent method to calculate emissions for all fire activity; enhance inputs used for calculating emissions.			
Obtain a batch-enabled version of FEPS. Calculate emissions using CONSUME to estimate consumption and FEPS to estimate emissions.	No	No	
Use MTBS burn severity data to provide combustion information to FEPS.	Yes	No	
Evaluate [coordinate evaluation of] three methods for calculating plume height: DAYSMOKE, Briggs, or WRAP (2002 EI method). Incorporate chosen method into the emissions inventory.	No	No	
Refine ERT calculations to discern whether chosen method(s) affect all pollutants or only particulate matter.	No	No	
Reporting: Develop one or more methods/formats for exporting emission inventories to best serve the intended uses of the data.			
Develop a universal (common) export format for modelers, such as NetCDF.	No	Yes	
Develop a GIS-based export format for planners, such as ESRI shapefile or geodatabase.	No	Yes	
Enhance [Update] the reporting page of the FETS to accommodate all options available with the planning-grade emission inventories.	Yes	No	
Task 3: Emission Inventory and System Improvements			\$ -
Convert existing MS-SQL database to a geospatial-enabled database.	Yes	No	
Migrate base layers to database and perform GIS operations within database.	Yes	No	
Replace interpolated precipitation maps with radar-based precipitation observations for use with CONSUME.	Yes	No	
Replace 1km FCCS map layer with LANDFIRE-based 30m FCCS map layer.	Yes	No	
Add Agricultural lands data from USDA-NASS to the FETS database.	Yes	No	
2011 FETS Task Budget ->			\$30,000.00