

ENVIRON**MEMORANDUM**

To: NETAC Technical Committee

From: Greg Yarwood

Date: April 17, 2009

Subject: Proposed Mobile Sampling of Ozone Precursors in Northeast Texas in September, 2009

NETAC's FY08/09 workplan includes Task 3 to conduct "Enhanced Ambient Monitoring" with a budget of \$250,000. The purpose of the enhanced ambient monitoring is to improve our understanding of the types and sources of ozone precursors in the vicinity of Longview. In August-October, 2008, the first FY08/09 monitoring task has been carried out; this task consisted of monitoring for total highly reactive volatile organic compounds (HRVOCs) at CAMS19 with a budget of \$70,000. The monitoring task proposed here is surface mobile monitoring that focuses on emissions from sources associated with oil and gas exploration and production in Northeast Texas, and has a proposed budget of \$75,000.

Surface mobile monitoring is an effective method for collecting air quality data over large geographic regions between fixed surface monitoring stations (e.g., TCEQ's CAMS locations). Instruments are installed in a vehicle that is driven along roads to conduct concentration surveys. This method has been applied by UT Austin in the Victoria area during 2006, 2007 and 2008. Continuous measurements were made for ozone, sulfur dioxide (SO₂), Carbon monoxide (CO) and nitrogen oxides (NO_x). During 2008, a monitor was added to measure continuous methane and total non methane hydrocarbons (TNMHC). A limited number of VOC canister samples were collected at discrete locations that were identified from the continuous monitoring data. A total of 26 trips have been accomplished. Each trip consisted of several preplanned sampling routes which were designed to provide information that could be used to evaluate photochemical model performance, to evaluate the impact of specific point and area sources, to evaluate the impact of Victoria urban sources and to evaluate transport of pollutants into the area.

Statement of Work

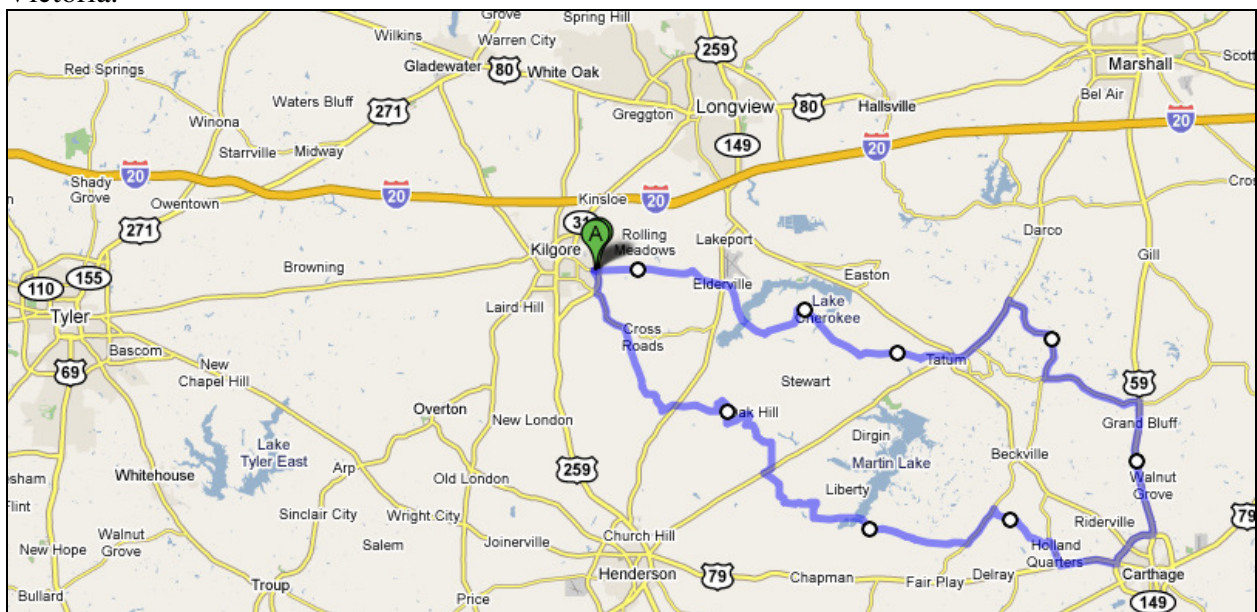
The objective for this project is to conduct vehicle-based mobile sampling to assess pollutant concentrations in Northeast Texas. Sampling will focus on rural areas with oil and gas production activities to investigate the spatial distribution and magnitude of VOC and NO_x emissions from oil and gas production activities. The deliverables will be:

1. A quality assurance project plan (QAPP)
2. A final report documenting the methodology and results from the project.
3. Electronic delivery of the data collected during the project.

Measurement Method

Mobile sampling will be conducted to assess pollutant concentrations in Northeast Texas. Sampling will focus on rural areas with oil and gas production activities to investigate the spatial distribution and magnitude of VOC and NO_x emissions from oil and gas production activities. Preplanned sampling routes will be developed by UT in conjunction with ENVIRON and Northeast Texas Air Care (NETAC). Most of the sampling would be accomplished on paved roads with little traffic to minimize interference by emissions from other vehicles. For this project, a NO_y monitor will replace the NO_x monitor used in the past. The advantage is that NO_y monitoring provides a better measure of regional NO_x emissions. TCEQ has agreed to provide a NO_y instrument for use in this study. The continuous hydrocarbon monitor collects methane and TNMHC data every 70 seconds. Ten grab samples will be collected in 6-liter canisters and analyzed for concentrations of 75 specific VOCs. The grab samples will be collected at locations close to oil and gas production activities where the continuous hydrocarbon monitor finds high TNMHC concentrations.

Typically, sampling can be conducted for about six hours from about 11 am to 5 pm local time. While sampling, the vehicle travels at about 25 to 30 mph. The preliminary plan is to cover the same sampling route in the morning and the afternoon, in which case sampling operations will last about three hours per trip and the length of the sampling route would be from 75 to 90 miles (see Figure). Sampling will be performed in September for 10 days comprising two 5 day periods. All attempts will be made to conduct the sampling when meteorological conditions are favorable for ozone formation, but this is often difficult to forecast over a period of one week. Sampling will be conducted in accordance with The University of Texas Surface Mobile Sampling Quality Assurance Project Plan that has been used for the sampling conducted in Victoria.



Example 90 mile route between Kilgore and Carthage to illustrate the area that could be sampled in a single trip

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Costs and Schedule

Project Completion Date: October 30, 2009
Project Cost: \$75,000

The costs presented are based on the following assumptions:

1. That a suitable covered, secure site can be located in the Longview/Tyler area where the sampling vehicle can be parked overnight. The gas cylinders will be transported to the area in a trailer, so the trailer will also have to be located at the secure site. The monitoring instruments have to be protected from the weather. The instruments must be powered during the whole time, so power must be available. Also at the site there must be a place where five large compressed gas bottles can be stored upright. These bottles contain the gas standards that will be used to calibrate the instruments each day prior to sampling and after sampling is completed. Rick McKnight at ETCOG has investigated site locations and identified suitable candidates.
2. That a NOy instrument can be borrowed from TCEQ for use in this project.
3. That NETAC provide one person who can be a part of the sampling team. This person will provide navigation along the sample routes selected and document the sampling activities. Rick McKnight at ETCOG is willing to perform this function.