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Alexander B. Grannis
Commissioner

SEP 16 2010

Mr. Raymond Werner
United States Environmental Protection Agency
290 Broadway
New York, NY 10007-1866

Dear Ray:

Enclosed you will find a copy of the New York State Department of Environmental Conservation's (NYSDEC) project performance report for Agreement No. XA97265006, "Establishing an Ambient Mercury Baseline for New York State," between NYSDEC and the United States Environmental Protection Agency. This report is submitted in accordance with Programmatic Condition No. 2, "Performance Reporting and Final Performance Report," of the Agreement. The report covers the period from April 2008 through August 2010.

If you have any questions or require additional information, please contact Tony Zappala, of my staff, at (518) 402-8451.

Sincerely,

David J. Shaw
Director, Division of Air Resources

Enclosures

cc: B. Kelly, EPA - Region II (w/ encl.)
M. Khan, EPA - Region II (w/ encl.)

Performance Report:

Grantee Organization Name: NYSDEC

Grant Number: XA-97265006-0

Project Title: Air Monitoring Plan for Establishing an Ambient Mercury Baseline for New York State

Project Period: 7/1/08 through 8/31/10

A. Brief Project Description

The project is designed to establish a reference baseline for mercury air concentrations and wet deposition in urban areas in New York State. This baseline data will be used in conjunction with other mercury monitoring measurements to track the overall progress of mercury reduction strategies for the two largest source categories, municipal waste combustors and coal fired electric utilities. Establishing a baseline as well as documenting progress with regulatory actions is consistent with the federal program to quantify regulatory achievement under the Government Performance and Results Act.

Using instrumentation to measure ambient elemental and oxidized mercury in Rochester and New York City, the NYSDEC will address whether the ratio of elemental to reactive gas mercury is enhanced from atmospheric interactions with the other pollutants prevalent in urban areas. The ambient mercury concentration alone does not adequately represent the mercury burden in urban areas. Weekly wet deposition measurements will be made of both elemental and divalent mercury to more thoroughly encompass the total mercury loading into the environment.

Recently, the Mercury Deposition Network (MDN) recognized that there may be significant differences between the concentrations found in their established rural network and from what might be found in heavily populated urban areas. MDN staff recently decided to seek out suitable urban monitoring sites to compare with their nation-wide rural network. They have reviewed and approved the specific monitoring locations we suggested for Rochester and New York City.

Data analysis for this project will target comparisons of the magnitude and ratio of reactive gas mercury to elemental mercury for ambient and wet deposition samples from the newly established urban sites with data from other regional monitoring locations. This will help other states and Canada evaluate the accuracy of their urban concentrations which could previously only be inferred from their predominantly rural data. Secondly, the speciated mercury concentrations will be compared to ozone, sulfur dioxide, meteorology and speciated PM-2.5 data in an effort to look at the effects of atmospheric reactions and decay rates versus that expected from known sources.

B. Comparison of Actual Accomplishments with the Anticipated outputs/outcomes Specified in the Assistance Agreement Work plan:

Progress reports were not written for 2007 since the bulk of that time was spent obtaining a contractual agreement with the MDN program, purchasing the 2 Tekran systems, attending Tekran training in Toronto, expanding the Rochester site to accommodate the equipment, purchasing and installing the MDN gauges and collectors and assisting the MDN staff in developing a suitable SOP for operation of the Tekran system. The actual collection of the wet deposition samples signified the start of the data collection phase of this program. Both the Rochester and Bronx sites initiated wet deposition sampling under the MDN protocol in the 2nd week of January 2008.

The 2 Tekran systems were installed in NYSDEC laboratory in Rensselaer, NY. The objective for this temporary installation is to determine collocated precision, stability of the instrument calibration and to develop reliable field maintenance procedures.

In the second Quarter of 2008, the Tekran systems began to experience difficulties due to a failure in an oven element connection and excessive moisture in the air downstream of the Model 1102 dryer. The oven element connection failure was caught because the data logging option records the temperature reading from each thermocouple. Tekran sent a new terminal block which corrected the problem. The dryer problem slowly developed as the ambient conditions became hotter and wetter in May and June. In the last week of June, Tekran said they had a major modification for the Model 1102 Dryer that would increase the capacity. The Dryers were shipped to Tekran June 24, 2008.

The Tekrans operated well in the lab with the newly designed dryers and the systems were installed in the NYSDEC monitoring locations in the Bronx in August 2008 and in Rochester in September 2008. The field data collection period specified in the work plan was two years and that period is nearly complete. The data will be summarized and work will begin on the final project report which will be available in time for the 2011 EPA Toxics meeting.

C. Reasons why Anticipated Outputs/outcomes not met:

The Tekran systems were scheduled to be installed and operational when the wet deposition sampling was initiated. The Tekrans were not actually installed in the field locations until the third Quarter of 2008. The delay was due to several issues including an electronic upgrade recommended by the manufacturer to eliminate the problem of premature lamp failure, the lack of an approved field SOP from the MDN program, the MDN's new siting guidance for the 1130 and 1135, a few persistent leaks or contaminations in the inlet systems of the 1130 and 1135 and insufficient capacity in the original 1102 dryer. The additional time spent in the lab refining the operation of the Tekrans has served to increase the reliability of the units in the field.

D. Other Information Including Analysis and Explanation of Costs Overruns or High Unit Costs:

The grant funds are nearly expended, however, the contract funds necessary to cover the costs of the MDN wet analysis have been set aside. The equipment portion of the budget was changed in order to cover the increased cost of the Tekran systems due to the need for the data logging option and for the manufacturer's recommended air drying system. It was expected that the funds would be nearly depleted at the beginning of the project, because nearly all of the necessary supplies had to be purchased prior to the start of the field portion of the project. The reduced balance on the remaining Grant funds should not affect the work plan.

E. Data Capture and Data Reports:

The data from the 2 Tekran systems which were operated in the lab in Albany are not going to be used as representative ambient data. This data was collected in order to help with the development of operational procedures that were incorporated in the QAPP and in the MDN SOP. The data from the 2 wet deposition samplers (gauge and collectors) from both locations are included in the MDN data base and will be available from their website. The data currently available from the MDN from sites operating prior to the 2 sites funded through this project lag up to 19 months after the date in which the sample was collected. The following MDN web address shows the site information for the two New York sites funded through this project.

http://nadp.sws.uiuc.edu/sites/sitemap.asp?net=mdn&state=ny

The wet deposition data capture suffered initially in January and early February 2008 because of a software problem in the installed MDN program. Their data logging software had a glitch that prevented the weekly download from being initiated. MDN staff shipped out a PDA with the new program which was uploaded to the two gauges in late January in the Bronx and in early February in Rochester. Data collection has not been an issue since then.

F. Project Data Distribution and Continuing Benefits

All of the data collected under this grant has been submitted to the MDN/AMNET database which is where the EPA and other Federal Agencies partner in the management of the national Hg database. The ambient Hg and wet deposition Hg data will be useful to both Federal regulators and State agencies as they implement new source controls for Hg.

G. Materials Associated with this Project

Baseline Measurements of Ambient Concentrations of Elemental, Reactive Gaseous and Particle-bound Mercury at Two Urban Locations in New York, NADP Annual Meeting and Scientific Symposium, October 6-8, 2009, Saratoga Springs, NY.

Baseline Measurements of Ambient Concentrations of Elemental, Reactive Gaseous and Particle-bound Mercury at Two Urban Locations in New York, NYSERDA EMEP Program Conference, October 15-16, 2009, Albany, NY.

The NYSDEC's Program to Monitor Mercury Wet Deposition and Ambient Hg(0), Divalent Hg and Hg(p) in Two Urban Areas, Nov. 15-16, 2007, Albany, New York.

Field techniques to assure the quality of atmospheric mercury speciation measurements, Philip I. Kilner1, Eric M. Prestbo1, Dirk Felton2, Thomas Holsen3 Seth Lyman4, Mark L. Olson5, 1) Tekran Instruments Corporation, 2) New York DEC, 3) Clarkson University, 4) University Nevada-Reno, 5) US Geological Survey, ICMGP, 2009, Guiyang, China.

A Data Review and Operational Notes: A Year Spent with the Tekran Speciated Ambient Mercury Analyzer at Two Urban Locations in New York State, National Air Monitoring Conference, November 2 - 5, 2009, Nashville, TN.

Urban Mercury Monitoring: Data Review and Operational Notes: A Year Spent with the Tekran Speciated Ambient Mercury Analyzer at Two Urban Locations in New York State and an update of the AMNET program, MARAMA Monitoring Conference, February 23, 2010, Philadelphia, PA.

H. Equipment Installation: Representative images from Rochester and the Bronx sites