

**Neighborhood Air Toxics Modeling Project
For
Houston and Corpus Christi – Stage 1**

Quarterly Report for the Period

January 1, 2010 through March 31, 2010

Submitted to

**The Honorable Janis Graham Jack
US District Court Judge, Southern District of Texas
Corpus Christi, Texas**

Submitted by

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I. Introduction

On February 1, 2008, the Court entered an Order (D.E. 981, Order (pp.1, 7-11)) regarding unclaimed settlement funds in Lease Oil Antitrust Litigation (No.11) Docket No. MDL No.1206. The Court requested a detailed project proposal from Dr. David Allen, the Gertz Regents Professor in Chemical Engineering and the Director of the Center for Energy and Environmental Resources at The University of Texas at Austin (UT Austin), regarding the use of \$9,643,134.80 in the Settlement Fund. The proposal was for a project titled “Neighborhood Air Toxics Modeling Project for Houston and Corpus Christi” (hereinafter “Air Toxics Project”). The Air Toxics Project was proposed in two stages. In Stage 1, UT Austin will develop, apply, demonstrate and make publicly available, neighborhood-scale air quality modeling tools for toxic air pollutants in the Corpus Christi, Texas and will extend the operation of the air quality monitoring network in Corpus Christi, Texas. In Stage 2, subject to the availability of funds, UT Austin will extend the modeling to the Houston, Texas ship channel region, develop a mobile monitoring station that can be deployed in Corpus Christi and in other regions of Texas and/or further extend the operating life of the existing stationary network in the same or a modified spatial configuration. If a mobile monitoring station is deployed, it will be used to map the spatial distributions of air pollutant concentrations and to inform the public. All ambient monitoring results will be used in synergy with the neighborhood-scale models to improve the understanding of emissions and the spatial distribution of air toxics in the region.

On February 21, 2008, the US District Court for the Southern District of Texas issued an order to the Clerk of the Court to distribute funds in the amount of \$4,586,014.92, plus accrued interest, to UT Austin for the purposes of implementing Stage 1 of the Air Toxics Project as described in the detailed proposal submitted to the Court by UT Austin on February 15, 2008 (D.E. 998).

Under the Order to Distribute Funds in MDL No. 1206, on March 3, 2008, at the direction of the Settlement Administrator, \$4,602,598.66 was disbursed to UT Austin for Stage 1 of the Project. This amount includes the interest accrued prior to distribution from the MDL No. 1206 Settlement Fund. Stage 2 funding has not been awarded by the US District Court.

This Stage 1 quarterly report has been prepared pursuant to the requirements of the Air Toxics Project and is being submitted to the US District Court.

II. Air Toxics Project – Stage 1 - Phase 1A Overview

A. Scope and Objectives

The objective of Stage I - Phase 1A of The Air Toxics Project for UT Austin and its subcontractors is to develop, apply, and make publicly available, neighborhood-scale air quality modeling tools for toxic air pollutants in the Corpus Christi area. Stage 1 – Phase 1A of the Air Toxics Project will provide significant and discernible environmental benefits to the Corpus Christi area by providing analyses of air pollutant concentrations experienced by the community, and providing post-event evaluation of pollutants emitted during releases. UT Austin is performing this work in collaboration with subcontractors at Texas A&M University and ENVIRON International Corporation.

B. Major Tasks

The major tasks for Stage I, Phase IA include:

1. *Development of a conceptual model of meteorological conditions likely to lead to high concentrations of air toxics in the Corpus Christi area.*

This task will identify meteorological conditions (seasons, temperatures, wind speeds, wind directions, frontal passages and other parameters) and air quality conditions that are most likely to lead to high concentrations of air toxics in populated regions of Corpus Christi. The conceptual model will be used to identify historical periods that can be used to develop and test air toxics modeling systems for Corpus Christi.

2. *Development of emissions inventory and land cover input information.*

These data will be developed at a spatial resolution that will allow the neighborhood scale air quality models to operate with a resolution of a few hundred meters.

3. *Application of dispersion models to estimate the neighborhood-scale concentrations of air toxics in Corpus Christi.*

Dispersion models represent the current best practice for estimating air toxics concentrations in urban areas. Using emissions, land cover, and meteorological data, a dispersion model will be used to estimate concentrations of air toxics in plumes from sources identified in the emissions inventory and during historical meteorological conditions identified during the conceptual model development

4. *Development of improved meteorological models of air pollutant dispersion in the Corpus Christi area.*

A more rigorous combined plume and gridded model able to characterize the complex coastal meteorology in the region will also be developed and applied in order to address uncertainties in predicted concentrations obtained from the dispersion model.

A state-of-the-science meteorological model will be used to simulate the three-dimensional weather conditions in the Corpus Christi area, with a focus on the replication of historical weather patterns identified in the conceptual model.

Simulation of local circulation features will be carefully assessed, and additional analyses will customize the model for best performance in the Corpus Christi area.

5. *Development of combined gridded and plume models to estimate neighborhood-scale concentrations of air toxics in Corpus Christi:*

The combined gridded and plume model will predict three-dimensional concentrations of selected air toxic pollutants throughout the Corpus Christi area using the meteorological modeling, emission inventory and land cover data described above.

An evaluation framework will be developed to compare predicted and observed concentrations during specific historical episodes and to refine the modeling approach and performance.

6. *Application of the combined dispersion and gridded modeling tools to estimate concentrations of air toxics in Corpus Christi.*

The combined dispersion and gridded modeling tools will be applied to estimate concentrations of air toxics in Corpus Christi under a variety of meteorological conditions for routine emissions and when monitoring data has indicated higher concentrations of air toxics than would be expected under routine emission conditions; spatial mappings of the estimated air toxics concentrations will be made available on a Project website.

C. Project Milestone Schedule

The meteorological and air quality modeling is on-going as described below.

D. Scheduled Project Presentations and Meetings

None during this period.

III. Air Toxics Project – Stage 1 - Phase 1B Overview

A. Scope and Objectives

The initial workplan for the Stage I funding called for application of the modeling tools to the Houston Ship Channel region after their demonstration in Corpus Christi with the goal of demonstrating that the neighborhood-scale air toxics modeling framework is applicable to other urban areas. The area surrounding the Ship Channel in east Harris County, Texas was to be used for this demonstration, and the period to be modeled will be August 15-September 15, 2006, which corresponds to the period of the Second Texas Air Quality Study (TexAQS II).

The initial workplan for Stage I has been restructured and Phase 1B of the project reserves approximately 50% of Stage 1 project funds, approximately \$2.3 million, to extend the operation of the Corpus Christi ambient monitoring network. As a result the modeling of the Houston Ship Channel region will be deferred pending availability of Stage 2 funds.

B. Goals

Under Phase 1B the project team will use the air quality modeling results in synergy with the data collected from the ambient network to help develop recommendations for future changes in the geographic configuration and/or instrumentation for the network that might facilitate better characterization of the air toxics exposure patterns.

IV. Stage 1 – Phase 1A Project Progress Report

A. Meteorological Team

Dr. Nielsen-Gammon's group at Texas A&M University is continuing the transfer of the September 2005-February 2006 Weather Research and Forecast (WRF) meteorological modeling simulations at a 1-km spatial resolution to ENVIRON and UT. The TAMU group will repeat this transfer process for the WRF simulations for the September 2008 – February 2009 period.

B. Modeling Team

UT completed an analysis of 1,3-butadiene concentrations using measurements from the UT CCAQP monitoring sites focusing on seasonal and diurnal trends, and the identification of emissions source areas during periods with higher concentrations.

UT completed AERMOD and CALPUFF dispersion modeling simulations using the 2005 TCEQ photochemical modeling inventories for benzene and 1,3-butadiene for industrial point sources and three years of meteorological data (2006-2008) for Oak Park and Solar Estates. AERMOD and CALPUFF are U.S. EPA recommended dispersion models and represent the state of practice in air toxics modeling in the U.S.

Model predictions were compared to auto-GC measurements at Oak Park and Solar Estates. Prediction of spatial distribution of benzene and 1,3-butadiene concentrations for the Corpus Christi area were prepared to facilitate analysis of concentrations in areas where monitors are not present.

UT is continuing to investigate factors that affect performance of the dispersion models and has made substantial progress on a written report of the results to date. New results from the modeling with all anthropogenic emission sources (discussed below) will be added as they are completed during the next two quarters. It is anticipated that a draft final report on the dispersion modeling activities will be completed during the summer of 2010. This report will include descriptions of the modeling methodology, bar charts and tables comparing the dispersion modeling results to ambient observations, maps of predicted spatial distribution of benzene and 1,3-butadiene concentrations, and discussions of key findings and implications for the region.

To date, the dispersion and photochemical modeling of benzene and 1,3-butadiene have only included emissions from industrial point sources. However, other types of anthropogenic (man-made) emissions exist for these compounds, including, for example, motor vehicles (mobile sources) and small, numerous sources such as gasoline stations (area sources). In order to provide the Corpus Christi community with predictions of concentrations that represent contributions from all anthropogenic sources, mobile and area source emissions will be added to the inputs for both types of the models. This effort will also allow the community to assess the relative contributions of different types of anthropogenic emissions (e.g., industrial point versus mobile).

ENVIRON completed initial CAMx simulations of benzene, 1,3-butadiene, and other air toxics using the 2005 TCEQ photochemical modeling inventories for all anthropogenic emissions sources and meteorological predictions for October-November 2006. The results of these simulations were compared to measurements at Oak Park and Solar Estates during the same time period in order to examine model performance and to determine the relative contributions of predicted contributions of other anthropogenic emission sources in addition to industrial point sources. ENVIRON will continue the photochemical modeling using Texas A&M University's September 2005-February 2006 and September 2008 – February 2009 WRF meteorological modeling simulations at a 1-km spatial resolution.

V. Collaborative Relationships and Leveraging of the Air Toxics Project

None during this period.

VI. Financial Summary

A. Financial Report

In the Neighborhood Air Toxics Modeling Project Quarterly Report for the period ending September 30, 2009, it was reported that The University of Texas at Austin had received a check for \$5854.24 from the Garden City Group. These funds were additional interest earned while the project funds were being held by the Garden City Group.

These funds were immediately submitted to the University Business Office for deposit into the project account. In March 2010, the Project Team was notified that the check for \$5854.24 had been returned to the University by the University's bank in September 2009 with the reason "Refer to Maker." The Garden City Group was notified, and their records indicated that the check had been deposited into a bank in which The University of Texas at Austin does not have an account. The Garden City Group notified their bank, JP Morgan Chase, of the situation and all parties involved submitted an Affidavit of Unauthorized Endorsement or Altered Item. The matter was investigated by JP Morgan Chase.

Because the funds are not available to be spent at this time, the University removed the amount of the check from the funds received in the Neighborhood Air Toxics Modeling Project. The information below reflects the removal of those funds.

On May 11, 2010, during the preparation of this report, the Garden City Group notified UT-Austin that JP Morgan Chase had completed its investigation and that the funds had been returned to the Lease Oil Litigation account. A new check was issued to UT-Austin and was received on May 12, 2010. The increase in funds will be reported in the next quarterly report after the check is deposited.

Details of the following financial summary information are included in Appendix A, beginning on page 8.

1. Detailed List of the Actual Expenditures Paid from Air Toxics Project Funds through March 31, 2010

Expenditures of Air Toxics Project funds during this quarter totaled \$201,096.89. The breakdown of expenditures can be found in Appendix A, page 9. The activities for which these expenditures were used are detailed in this report.

2. Total Interest Earned on Air Toxics Project Funds through March 31, 2010

The interest earned during this quarter totaled \$21,268.86. A report providing detailed calculations of the interest earned on the Air Toxics Project funds is included in Appendix A, page 8.

3. Balance as of March 31, 2010, in the Air Toxics Project Account

The balance in the Air Toxics Project account, including interest earned totals \$3,354,971.20.

4. Anticipated Expenditures for the Funds Remaining in the Air Toxics Project Account

The anticipated expenditures for the remaining funds will total \$3,354,971.20.

Quarterly Report Distribution List:

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Members of the Advisory Board of the *Corpus Christi Air Monitoring and
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APPENDIX A

FINANCIAL REPORT of Expenditures and Interest Earned

Neighborhood Air Toxics Modeling Project for Houston and Corpus Christi - Stage 1 Phase 1A

Accounting Report for the Quarter 01/01/2010 - 03/31/2010

A. Total Amount of Air Toxics Funds and Other Funds Received Under This Proposal

Total Grant Amount:	\$4,608,452.90
Total Interest Earned:	\$229,778.56
Returned Cheque:	(\$5,854.24)
Total Funds Received:	\$4,832,377.22

B. Summary of Expenditures Paid by Air Toxics Funds

		Yr 1 and Yr2 Budget	Year 3 Budget	Adjustments this Quarter	Adjusted Budget	Prior Activity	Current Activity 01/01/10 - 03/31/10	Encumbrances	Remaining Balance 3/31/2010
Salaries-Prof	12	\$616,882.00	\$244,979.00	(\$16,471.00)	\$845,390.00	(\$563,814.17)	(\$83,694.63)	(\$25,431.39)	\$172,449.81
Salaries-CEER	15	\$66,780.00	\$0.00	\$24,045.00	\$90,825.00	(\$62,118.44)	(\$4,596.44)	(\$10,882.50)	\$13,227.62
Fringe	14	\$149,185.00	\$53,895.00	\$1,957.00	\$205,037.00	(\$135,820.92)	(\$20,369.26)	(\$8,478.15)	\$40,368.68
Supplies	50	\$61,991.00	\$5,500.00	(\$9,531.00)	\$57,960.00	(\$31,544.11)	\$0.00	\$0.00	\$26,415.89
Contingency	51	\$6,746.00	\$27,805.00	\$0.00	\$34,551.00	\$0.00	\$0.00	\$0.00	\$34,551.00
Consultants	60	\$22,500.00	\$2,500.00	\$0.00	\$25,000.00	\$0.00	\$0.00	\$0.00	\$25,000.00
Subcontracts	61-63	\$600,000.00	\$0.00	\$0.00	\$600,000.00	(\$293,870.07)	(\$61,999.55)	\$0.00	\$244,130.38
Modeling/Computer Sv:	67	\$46,500.00	\$12,500.00	\$0.00	\$59,000.00	\$0.00	\$0.00	\$0.00	\$59,000.00
Tuition	71	\$17,727.00	\$0.00	\$0.00	\$17,727.00	(\$13,395.00)	(\$4,207.00)	\$0.00	\$125.00
Travel	75	\$15,000.00	\$5,000.00	\$0.00	\$20,000.00	(\$2,026.33)	\$0.00	\$0.00	\$17,973.67
Equipment	80	\$17,500.00	\$7,500.00	\$0.00	\$25,000.00	(\$7,245.00)	\$0.00	\$0.00	\$17,755.00
Indirect Costs	90	\$243,122.00	\$53,952.00	\$0.00	\$297,074.00	(\$166,475.09)	(\$26,230.02)	\$0.00	\$104,368.89
TOTALS		\$1,863,933.00	\$413,631.00	\$0.00	\$2,277,564.00	(\$1,276,309.13)	(\$201,096.89)	(\$44,792.04)	\$755,365.94

C. Interest Earned by COCP Funds as of 03/31/2010

Prior Interest Earned:	\$208,509.70
Interest Earned This Quarter:	\$21,268.86
Total Interest Earned to Date:	\$229,778.56

D. Balance of COCP Funds as of 03/31/2010

Total Grant Amount:	\$4,608,452.90
Total Interest Earned:	\$229,778.56
Total Expenditures:	(\$1,477,406.02)
Returned Cheque:	(\$5,854.24)
Remaining Balance:	\$3,354,971.20

I certify that the numbers are accurate
and reflect actual expenditures
for the quarter


Accounting Certification