ANNUAL REPORT
TO THE U.S. DISTRICT COURT
FOR THE
CORPUS CHRISTI AIR MONITORING AND SURVEILLANCE CAMERA PROJECT

Activity Summary for the period from
October 2, 2005 through October1, 2006

On October 1, 2003, 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 $6,700,000, plus interest accrued, to The University of Texas at Austin (University) to implement the court ordered condition of probation (COCP) project *Corpus Christi Air Monitoring and Surveillance Camera Installation and Operation* (Project). This annual report has been prepared pursuant to the requirements of the project proposal and is being submitted to the US District Court, the US Environmental Protection Agency (EPA), and the Texas Commission on Environmental Quality (TCEQ).

The COCP consists of a network of seven (7) air monitoring stations as shown in the map below with air monitoring instruments and surveillance camera equipment as shown in Table 1, page2.

Table 1. Schedule of Air Monitoring Sites, Locations and Major Instrumentation

TCEQ CAMS Nos.	Latitude	Longitude	Description of Site Location	Monitoring Equipment				
				Auto GC	TNMHC	H2S & SO2	Met Station	Camera
634	27.798889º North	97.433889º West	Oak Park Recreation Center	Yes			Yes	
629	27.817500º North	97.419722º West	Grain Elevator @ Port of Corpus Christi		Yes	Yes	Yes	
630	27.824444º North	97.432500º West	J. I. Hailey Site @ Port of Corpus Christi		Yes	Yes	Yes	
635	27.811389º North	97.465556º West	TCEQ Monitoring Site C199 @ Dona Park		Yes	Yes	Yes	Yes
631	27.845278º North	97.525556º West	Port of Corpus Christi on West End of CC Inner Harbor		Yes	Yes	Yes	
632	27.827222º North	97.528889º West	Off Up River Road on Flint Hills Resources Easement		Yes	Yes	Yes	
633	27.908333º North	97.542222º West	Solar Estates Park at end of Sunshine Road	Yes		Yes	Yes	Yes

Legend

Auto GC	automated gas chromatograph
TNMHC	total non-methane hydrocarbon analyzer
H_2S	hydrogen sulfide analyzer
SO_2	sulfur dioxide analyzer
Met Station	meteorology station consisting of measurement instruments for wind speed, wind direction, ambient air temperature and relative humidity
Camera	surveillance camera

A. OPERATIONS AND MAINTENANCE OF SITES

Summary of Data Findings from Monitoring Sites

As noted in Table 1, page 2, the monitoring network provides measurements of a variety of air pollutants, including hydrocarbons, sulfur dioxide and hydrogen sulfide. Provided below are brief comparisons of the air pollutants concentrations observed during this year to concentrations observed in previous periods. More details are available in Appendix A, page 7.

Auto-GC Data and Effects Screening Level Summary Oct. 2005-Sept. 2006

Appendix A, pages 8 – 10, contain a comparison between hourly average concentrations of hydrocarbons measured, using the automated gas chromatographs, at two residential neighborhood sites (Oak Park and Solar Estates). The concentrations are compared to health effects screening levels (ESLs) established by the Texas Commission on Environmental Quality (TCEQ). The data provided in Appendix A, page 7, are for the most recent rolling four-quarter (annual) period (10/1/05-9/30/06) and for the third quarter of 2006. With the exception of benzene, concentrations measured by the auto-GCs have been below the ESLs.

Year-to-Year Comparisons Auto-GC Concentrations.

Appendix A, pages 11-18, contain a comparison between concentrations measured using the two auto-GCs in 2005 and 2006. The data are summarized in a manner that compares the same months from different years, since it has been shown that regional wind patterns vary in a similar manner from year-to-year by season. Overall, concentrations are somewhat lower in 2006 than in 2005. In a few cases, particular species had larger changes than others, which may point to actual emission source changes or other causes.

Benzene Measurements at Auto-GCs

Several hourly benzene observations have been higher than the ESL concentration of 25 parts per billion volume (ppbV) which is based on a one-hour average. In addition to the ESL based on one-hour averaged concentrations, the TCEQ determines an ESL based on annual average concentrations. The annual average ESL is 1 ppbV. The long-term annual mean benzene concentration at Solar Estates has held steady around one-third the level of the annual ESL concentration, and the long-term annual mean at Oak Park is three-quarters of the annual ESL. In Appendix A, pages 18-29, there appears a more detailed examination of the benzene concentrations collected with the two auto-GCs.

Valero Fire Case Study Event

A notable event during the second quarter of 2006 was a fire on the north side of the Valero plant west of the Dona Park site which occurred on June 1. The location and viewing pattern of the camera system at the Dona Park C635 site proved to be highly valuable in capturing the start of the visible fire, and in helping to characterize it over time. The visible fire extended from 12:04 AM through 3:26 AM CST. However, hydrocarbon emissions from this fire were detected at all seven TNMHC monitors in the network and both auto-GCs over the course of the day. Evidence for relating the effects of the fire on specific monitors was provided by the on-line trajectory tool, which showed that a peak in TNMHC was measured at times roughly coincident with the passage of a plume modeled to have originated from the location of the fire. In addition, the composition of the speciated hydrocarbon mix at the two automated auto-GCs in the network showed strong agreement in measuring similar heavier molecular-weight compounds, again roughly coincident with the passage of the modeled plume. For many heavier molecular-weight species, the values measured during the peak hours on June 1 were the maxima recorded by the network to date. The data have been reviewed by TCEQ toxicologists. A more detailed discussion appears in Appendix A, page 30.

Sulfur Species Summary

Neither hydrogen sulfide (H_2S) nor sulfur dioxide (SO_2) concentrations exceeded TCEQ screening thresholds at the project sites over the Oct. 2005-Sept. 2006 period. The TCEQ Huisache CAMS 98 site detected H_2S concentrations over the TCEQ residential screening threshold on Jan. 17, 2006.

B. PROJECT MANAGEMENT AND PLANNING

Project Management and Planning during this period has focused on five (5) major activities.

1. **Site Operations and Maintenance and Quality Assurance**

Routine operations, maintenance and quality assurance activities have become the norm at each site. These activities help to maintain high data capture and quality of data.

2. **Data Analysis**

The Project now has more than one year's worth of data. The focus of data analysis has been to examine the frequency, level and direction of sources when measurements exceed trigger or warning levels and to analyze data for trends and other patterns indicated in the data collected.

3. **Communication**

Information about the status of the Project has been communicated through:

a. Advisory Board Meetings,
b. Project Website, which is operational with portions under development,

c. Quarterly Technical and Financial Reports to the Court and Advisory Board, and
d. Presentations to the Corpus Christi Long Term Health Group.

4. **Budget Monitoring**
Budget monitoring during the period has focused on:
a. Project costs for Phase II-Sites Operation and Maintenance,
b. Administration and oversight costs incurred by the University, and
c. Financial reports included at Appendix B, page 34.

5. **Other Contributions**
The University of Texas at Austin has been awarded funding for three (3) Supplemental Environmental Projects (SEP) from the Texas Commission on Environmental Quality since the Project began. Prior to the 2005/2006 fiscal year, a SEP project was awarded which supported the operations and maintenance of the seven (7) air monitoring stations in the Corpus Christi area for approximately one year and funded the development of a Trajectory Tool, which assists Project personnel in understanding the origination of pollutant sources. The second SEP, funded in the prior fiscal year (February, 2005), enabled UT Austin to purchase additional canisters for the collection of air samples at the seven monitoring stations. Both of these SEPs were completed during this reporting period.

During the 2005/2006 fiscal year, the third SEP award was authorized and is still ongoing. This SEP will enhance the existing Trajectory Tool by developing three computer tools, which will assist in estimating a likely path of air contaminants prior to the contaminants reaching any of the seven established air monitoring stations. A second task authorized under this SEP will allow for additional canister analysis at each of the seven air monitoring stations. The final task under this SEP will fund the purchase and installation of hardware and software to minimize data loss associated with power loss and the installation of a wind direction filter at the Flint Hills Site.

C. ADVISORY BOARD

1. The Advisory Board for the Corpus Christi Air Monitoring and Surveillance Camera Project is a voluntary Board that consists of eight members. The members and their representation on the Board follow:

Ms. Gretchen Arnold	Local Air Quality Issues and Board Spokesperson
Mr. Ron Barnard	Near Non-Attainment Area Liaison - Instrumentation Local Air Quality Issues and Board Spokesperson
Dr. Eugene Billiot	Technical Support to the Board - Instrumentation
*Dr. William Burgin	Local Public Health - Local Air Quality Issues
*Ms. Joyce Jarmon	Community Representation
*Ms. Charlotte Knesek	Community Representation
Dr. Glen Kost	Community Representation
Ms. Pat Suter	Local Advocacy Group

*Indicates a new member effective August 21, 2006.

2. Three meetings of the Advisory Board were held during the third year of the Project. All meetings were held on the campus of Texas A&M University in Corpus Christi, Texas. Highlights from these meetings follow:

a. *October 31, 2005 Meeting*

- Four Board Members and representatives from the University of Texas at Austin, the U.S. District Court, and the Texas Commission on Environmental Quality attended.
- An update on status of the operations and maintenance of the seven monitoring stations was presented.
- UT Austin's Quality Assurance Officer, Dr. David Sullivan gave a summary of the early findings resulting from the analysis of data collected at the monitoring stations.
- Preparation of an outline detailing the content and presentation of the annual report to the US District Court was discussed.
- During the meeting the Board expressed interest in the process for the development of a notification tool and the involvement of industry in the notification process.

b. *March 22, 2006 Meeting*

- Five Board Members and representatives from the University of Texas at Austin and the Texas Commission on Environmental Quality attended.
- An update on the analysis of the data collected at the monitoring stations was presented by UT Austin.
- The Board was updated on the presentation of the Project's Annual Report to the US District Court. During the presentation of the Annual Report, the Court expressed approval and a desire to have industry participation in that portion of the notification process when the network sends alerts in response to triggers resulting from an event. Discussions for establishing a notification tool began.
- The process for replacing three (3) vacancies on the Board began. A call for nominations was given to the attendees and the approval process was discussed.

c. *June 14, 2006 Meeting*

- Four Board Members and representatives from the University of Texas at Austin, the U.S. District Court, the Texas Commission on Environmental Quality and two (2) representatives from Air Quality Solutions, Inc., who are the site operations and maintenance contractors, attended.
- A presentation on the data resulting from event sampling canister data was provided. Discussions about the fire at the Valero refinery took place. It was demonstrated that the camera at the Dona Park site recorded the fire.
- Notification tool models, notification processes, parameters and required approvals for a notification tool were included in the discussions.
- The Board was advised that UT Austin had been requested to give information about the Air Monitoring Project in the Corpus Christi area to the Corpus Christi Long Term Health Group. Discussions about the content and format for those presentations followed.
- An overview of the Auto GC systems located at Solar Estates and Oak Park was presented. The attendees discussed the sampling times and compounds analyzed at these sites.

3. During this reporting period five (5) members of the Advisory Board agreed to extend their service on the Board through December 1, 2007. Three (3) new Board Members, Dr.

William Burgin, Ms. Joyce Jarmon and Ms. Charlotte Knesek who replaced Dr. Alice Boostrom, Ms. Lena Coleman and Mr. Vinay Dulip, respectively, were appointed to the Advisory Board on August 21, 2006.

APPENDIX A

Data Analysis for Corpus Christi Annual Report
October 2005 – September 2006

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Auto-GC Effects Screening Level Summary

Shown in Table 1 are a summary of a TCEQ Web page on Effects Screening Levels (ESLs) accessed at http://www.tceq.state.tx.us/implementation/tox/esl/ESLMain.html on Nov. 19, 2006. The TCEQ establishes ESLs to evaluate the potential for effects to occur as a result of exposure to concentrations of constituents in the air. The ESLs are based on data concerning health effects, potential for odors to be a nuisance, effects on vegetation, and corrosive effects, but ESLs are not ambient air standards. If predicted or measured airborne levels of a constituent do not exceed the ESL, adverse health or welfare effects are not expected. If ambient levels of constituents in air exceed the ESL, it does not necessarily indicate a problem but rather triggers a review in more depth.

Tables 1 – 4, pages 8, 9and 10, summarize both the 3rd quarter of 2006 and the most recent rolling four-quarter (annual) period (10/1/05-9/30/06). The table shows the arithmetic mean of all observations, the annual ESL, the 90th and 99th percentiles for observed values, the maximum measured value, the odor ESL (if one exists), and the one-hour ESL. Note that not all data have been validated and are thus subject to change. All values in the following tables are in ppbV units. A few hourly benzene observations have been higher than the one-hour ESL. The long-term annual mean at Solar Estates has held steady around one-third the level of the ESL, and the long term annual mean at Oak Park is approximately three-quarters of the ESL.

Table 1 Oak Park (C634) Third quarter, 2006 Auto-GC Summary, ppbV units

Species	mean	p90	p99	max	Annual ESL	Odor ESL	1-hour ESL
Ethane	4.88	12.70	44.40	80.40			10000
Ethylene	0.68	1.45	7.60	19.35			1022
Propane	4.22	11.23	48.17	107.40	1000		10000
Propylene	0.91	1.37	17.47	118.20			68120
n_Hexane	0.40	0.97	4.72	13.57	50		500
Isobutane	1.61	4.08	23.00	42.20	800	2042	8000
13_Butadiene	0.04	0.08	0.28	2.28	5		50
1_Butene	0.11	0.13	2.50	7.10	740	69	7400
c_2_Butene	0.10	0.10	2.30	6.73	740	600	7400
t_2_Butene	0.14	0.13	2.95	9.25	740	600	7400
o_Xylene	0.08	0.20	0.71	1.54	100	1795	1000
Isopentane	1.97	4.36	25.22	78.04	120		1200
1_Pentene	0.05	0.10	0.58	1.54	800	30	8000
c_2_Pentene	0.05	0.10	0.76	2.14	800	30	8000
t_2_Pentene	0.10	0.16	1.40	3.92	800	30	8000
Benzene	0.52	0.88	9.27	51.15	1		25
Cyclohexane	0.14	0.40	1.82	5.17	100	415	1000
n_Pentane	1.21	2.52	16.18	77.14	120		1200
Toluene	0.52	1.33	4.10	11.71	50		500
n_Butane	2.00	4.88	27.15	67.85	800		8000
p_Xylene_m_Xylene	0.23	0.53	2.33	4.70	100	480	1000
Ethyl_Benzene	0.06	0.15	0.58	1.63	100	461	1000
Isopropyl_Benzene_Cumene	0.02	0.02	0.29	1.38	50	100	500
124_Trimethylbenzene	0.09	0.20	0.68	1.92	25		250

Table 2 Oak Park (C634) Rolling 1-year (Oct 05-Sep 06) Auto-GC Summary, ppbV units

Species	mean	p90	p99	max	Annual ESL	Odor ESL	1-hour ESL
Ethane	8.46	22.10	62.10	307.15			10000
Ethylene	1.02	2.35	9.20	73.05			1022
Propane	6.85	18.60	67.23	253.57	1000		10000
Propylene	1.09	2.60	13.70	118.20			68120
n_Hexane	0.62	1.63	7.15	35.05	50		500
Isobutane	2.74	7.30	26.48	95.38	800	2042	8000
13_Butadiene	0.05	0.10	0.33	7.95	5		50
1_Butene	0.16	0.30	2.50	7.10	740	69	7400
c_2_Butene	0.13	0.25	2.18	6.73	740	600	7400
t_2_Butene	0.18	0.30	2.90	9.25	740	600	7400
o_Xylene	0.10	0.23	0.76	27.31	100	1795	1000
Isopentane	2.83	7.26	29.94	106.78	120		1200
1_Pentene	0.05	0.12	0.50	3.52	800	30	8000
c_2_Pentene	0.05	0.12	0.50	2.34	800	30	8000
t_2_Pentene	0.10	0.22	0.94	5.04	800	30	8000
Benzene	0.74	1.62	10.03	**51.15**	1		**25**
Cyclohexane	0.27	0.78	2.85	36.87	100	415	1000
n_Pentane	1.84	4.26	24.84	172.44	120		1200
Toluene	0.75	1.67	6.89	69.30	50		500
n_Butane	3.70	10.40	35.35	129.15	800		8000
p_Xylene_m_Xylene	0.26	0.63	2.25	36.74	100	480	1000
Ethyl_Benzene	0.07	0.18	0.59	5.43	100	461	1000
Isopropyl_Benzene_Cumene	0.04	0.07	0.52	19.69	50	100	500
124_Trimethylbenzene	0.09	0.19	0.82	10.33	25		250

Table 3 Solar Estates (C633) Third quarter, 2006 Auto-GC Summary, ppbV units

Species	mean	p90	p99	max	Annual ESL	Odor ESL	1-hour ESL
Ethane	7.01	15.95	38.90	73.25			10000
Ethylene	0.41	1.00	2.90	6.40			1022
Propane	4.30	9.97	26.63	41.67	1000		10000
Propylene	0.31	0.53	1.93	51.13			68120
n_Hexane	0.40	0.93	2.45	8.80	50		500
Isobutane	1.60	3.83	10.35	19.23	800	2042	8000
13_Butadiene	0.12	0.08	1.53	19.90	5		50
1_Butene	0.04	0.08	0.23	0.78	740	69	7400
c_2_Butene	0.08	0.13	0.45	1.95	740	600	7400
t_2_Butene	0.22	0.30	0.50	1.40	740	600	7400
o_Xylene	0.06	0.14	0.39	2.91	100	1795	1000
Isopentane	1.55	3.84	8.90	20.64	120		1200
1_Pentene	0.03	0.06	0.22	0.92	800	30	8000
c_2_Pentene	0.02	0.06	0.26	0.98	800	30	8000
t_2_Pentene	0.05	0.10	0.48	1.88	800	30	8000
Benzene	0.32	0.78	2.28	8.78	1		25
Cyclohexane	0.26	0.67	2.00	5.50	100	415	1000
n_Pentane	0.97	2.40	5.40	13.38	120		1200
Toluene	0.36	0.86	1.96	3.67	50		500
n_Butane	1.94	4.73	11.00	24.68	800		8000
p_Xylene_m_Xylene	0.23	0.49	2.44	8.78	100	480	1000
Ethyl_Benzene	0.05	0.13	0.38	2.16	100	461	1000
Isopropyl_Benzene_Cumene	0.01	0.02	0.13	0.92	50	100	500
124_Trimethylbenzene	0.05	0.12	0.38	0.76	25		250

Table 4 Solar Estates C633 Rolling 1-year (Oct 05-Sep 06) Auto-GC Summary, ppbV units

Species	mean	p90	p99	max	Annual ESL	Odor ESL	1-hour ESL
Ethane	8.76	19.60	58.05	136.20			10000
Ethylene	0.42	1.00	2.60	8.55			1022
Propane	5.59	12.93	38.30	117.00	1000		10000
Propylene	0.46	0.97	4.50	51.13			68120
n_Hexane	0.42	0.97	2.67	35.77	50		500
Isobutane	2.29	4.93	15.15	54.35	800	2042	8000
13_Butadiene	0.08	0.08	0.70	34.80	5		50
1_Butene	0.05	0.10	0.40	4.25	740	69	7400
c_2_Butene	0.07	0.13	0.50	12.48	740	600	7400
t_2_Butene	0.17	0.28	0.65	7.20	740	600	7400
o_Xylene	0.06	0.14	0.41	2.91	100	1795	1000
Isopentane	1.90	4.44	11.86	55.86	120		1200
1_Pentene	0.02	0.06	0.20	0.92	800	30	8000
c_2_Pentene	0.02	0.04	0.20	0.98	800	30	8000
t_2_Pentene	0.04	0.08	0.46	1.88	800	30	8000
Benzene	0.33	0.75	2.23	**34.43**	1		**25**
Cyclohexane	0.26	0.65	1.88	9.05	100	415	1000
n_Pentane	1.12	2.64	7.24	36.58	120		1200
Toluene	0.39	0.89	2.20	33.56	50		500
n_Butane	2.87	6.93	21.25	70.60	800		8000
p_Xylene_m_Xylene	0.32	0.55	4.56	32.69	100	480	1000
Ethyl_Benzene	0.05	0.13	0.35	3.03	100	461	1000
Isopropyl_Benzene_Cumene	0.01	0.02	0.13	0.92	50	100	500
124_Trimethylbenzene	0.06	0.12	0.37	28.30	25		250

The list of months for which data validation has been completed appears in Figure 5, page 11. Note that site "32" is Oak Park, and site "33" is Solar Estates. The red cells in March and April 2006 indicate the site failed to meet the target 75 percent data completion in those months. This is a result of the data validation process. Three other long-running TCEQ auto-GCs (A=Clinton Dr., in Houston, D=Chamizal in El Paso, E=Hinton in Dallas) are shown to reflect the comparability in data recovery. Data validation fell behind owing to extraordinary factors in 2005 and those months have been given a lower priority than current months.

Figure 5 Auto-GC Data Validation as of 9/30/06

AutoGC Data Recovery Report

Percent Data Recovery Date Range: 10/2005 - 09/2006					
Date	**32**	**33**	**A**	**D**	**E**
Oct 2005			81	71	89
Nov 2005			69	95	67*
Dec 2005			80	84	99
Jan 2006	85	98	92	98	94
Feb 2006	92	96	92	96	93
Mar 2006	97	56	98	88	99
Apr 2006	91	72	86	97	45*
May 2006	99	83	88	94	60
Jun 2006	98	87	97	89	80
Jul 2006	96	65*	92	79	93
Aug 2006	75*	94	98	96	92
Sep 2006				90	92
Average	92	81	88	90	84
Date	**32**	**33**	**A**	**D**	**E**

Key:

Preventive maintenance performed, reducing data recovery

Data return below 75 percent

32 = Oak Park C634, Corpus Christi
33 = Solar Estates C633, Corpus Christi
A = Clinton Drive C403, TCEQ Houston
D = Hinton Drive C401, TCEQ Dallas
E = Chamizal C41, TCEQ El Paso

Numbers shown in Table 5 represent the total data recovery based both upon operations of the monitors and subsequent data validation. It is known that there were high levels of data recovery (>90 percent) based on operations in the missing months (Oct., Nov, Dec. 2005 and Sept. 2006), but data validation is still pending.

Comparison of Auto-GC Levels One Year Apart

The auto-GC data at the Oak Park CAMS 634 and Solar Estates CAMS 633 sites have been compiled to allow a comparison between measurements one year apart to assess differences that may be related to possible changes in emissions or to varying meteorology.

The current subcontractor began operating the sites in March 2005, so that month is a convenient starting point. Two comparison time periods are presented. First, in order to compare data in a

comprehensive manner, the average and median values for each species were computed for March – October 2005 and for March – October 2006. Bracketing the data into these eight month periods generates averages that can be compared year-to-year using the same months. However, the highest concentrations for these two sites generally occur under northerly winds, which are more common during the months from September through March. This implies that the averages for the eight month periods are likely to be biased low with regard to estimating an annual mean. Thus, a second comparison is presented for September – October 2005 and September – October 2006. In both sets of comparisons, both mean and median statistics are assessed.

The overall result is that differences for the most part are relatively small. Using the eight month comparisons, about three-quarters of the species at Solar Estates C634 were lower in 2006. TNMHC mass was about 20 percent lower in 2006. Most of the change in mass is attributable to declines in low-molecular weight alkanes. See Figure 6a, page 12 and Figure 6b, page 13. Species are graphed in decreasing concentration for 2005.

Figure 6a Higher concentration hydrocarbon species (ppbV)

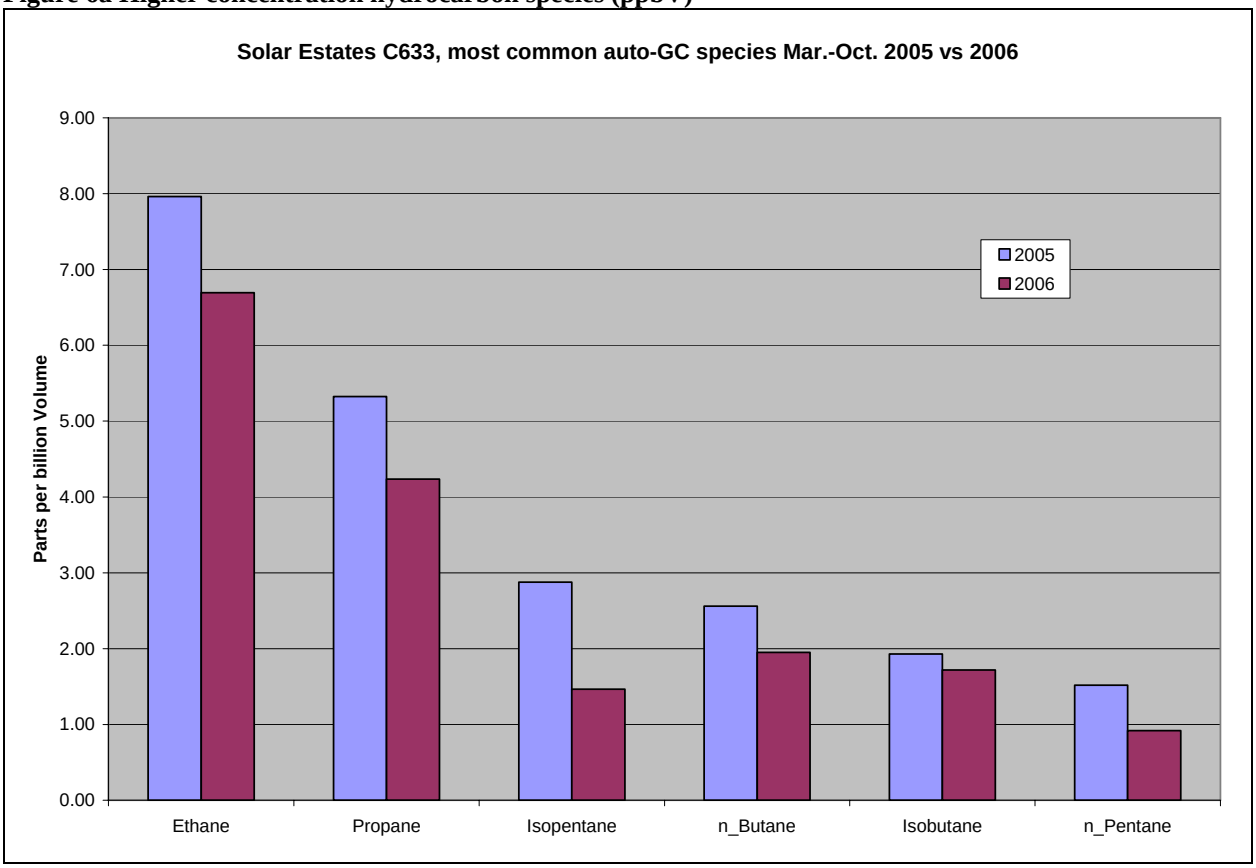
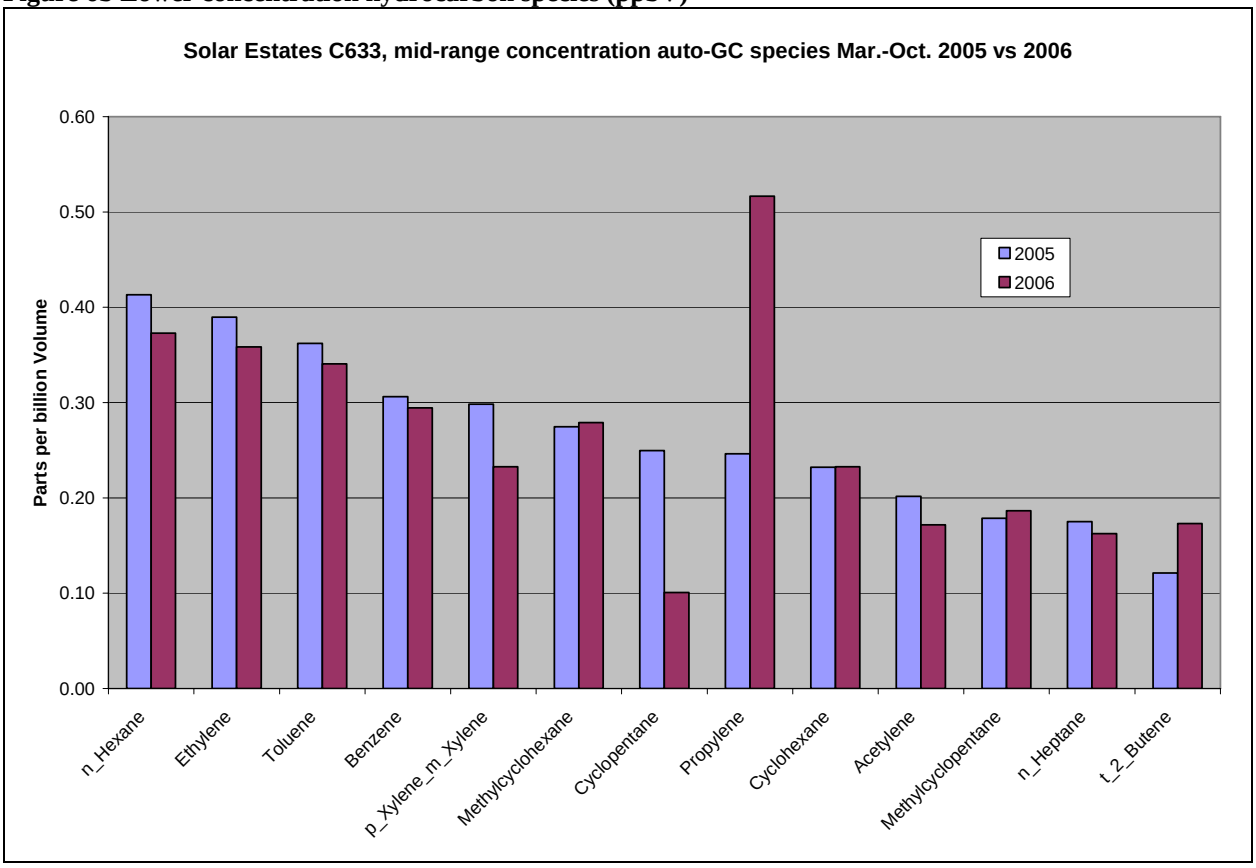


Figure 6b Lower concentration hydrocarbon species (ppbV)



Differences were less prominent in the eight month summaries at Oak Park C633, where only 61 percent of the species had a decline in mean, and only 33 percent had a decline in median concentration. TNMHC mass was about 15 percent lower in 2006. See Figure 7a, page 14 and Figure 7b, page 15.

Figure 7a Higher concentration hydrocarbon species at Oak Park 2005 vs 2006 (ppbV)

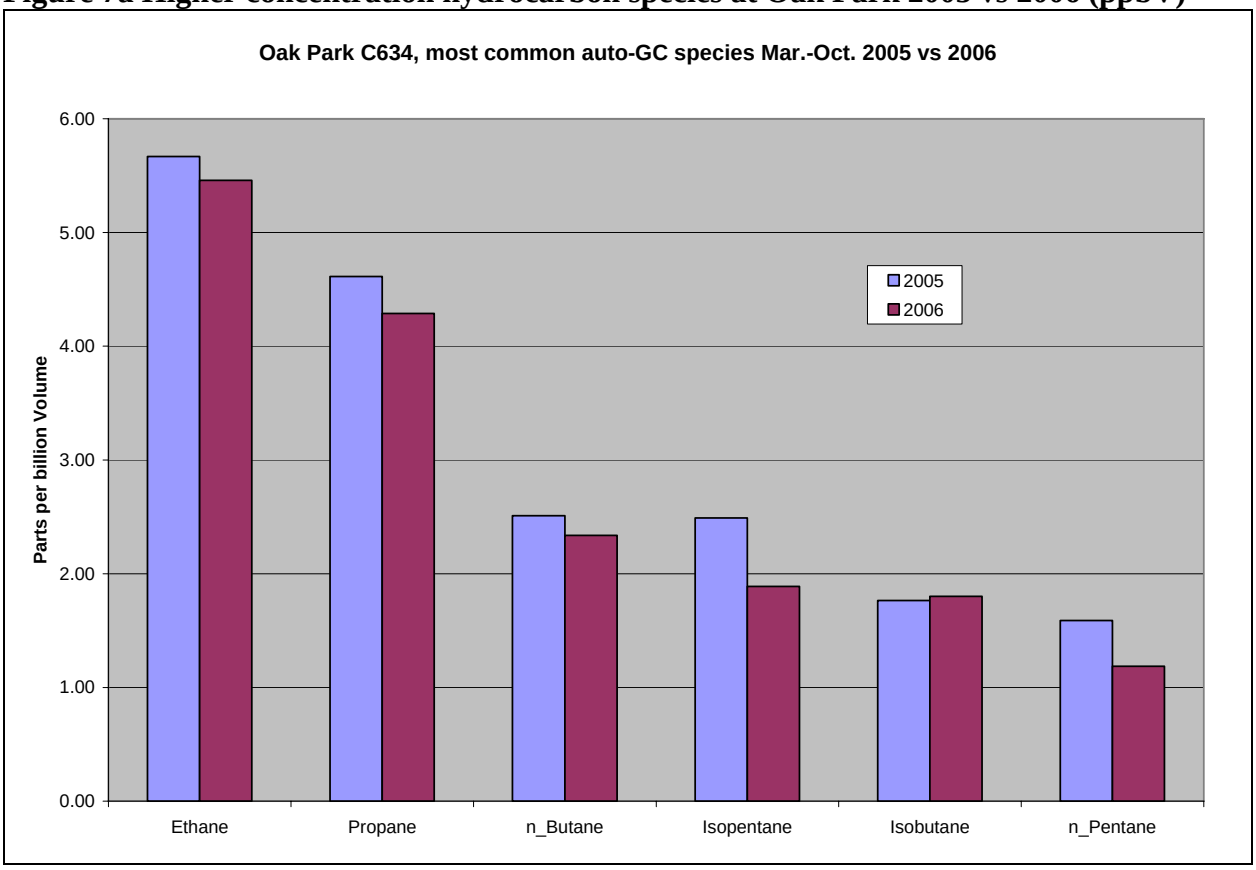
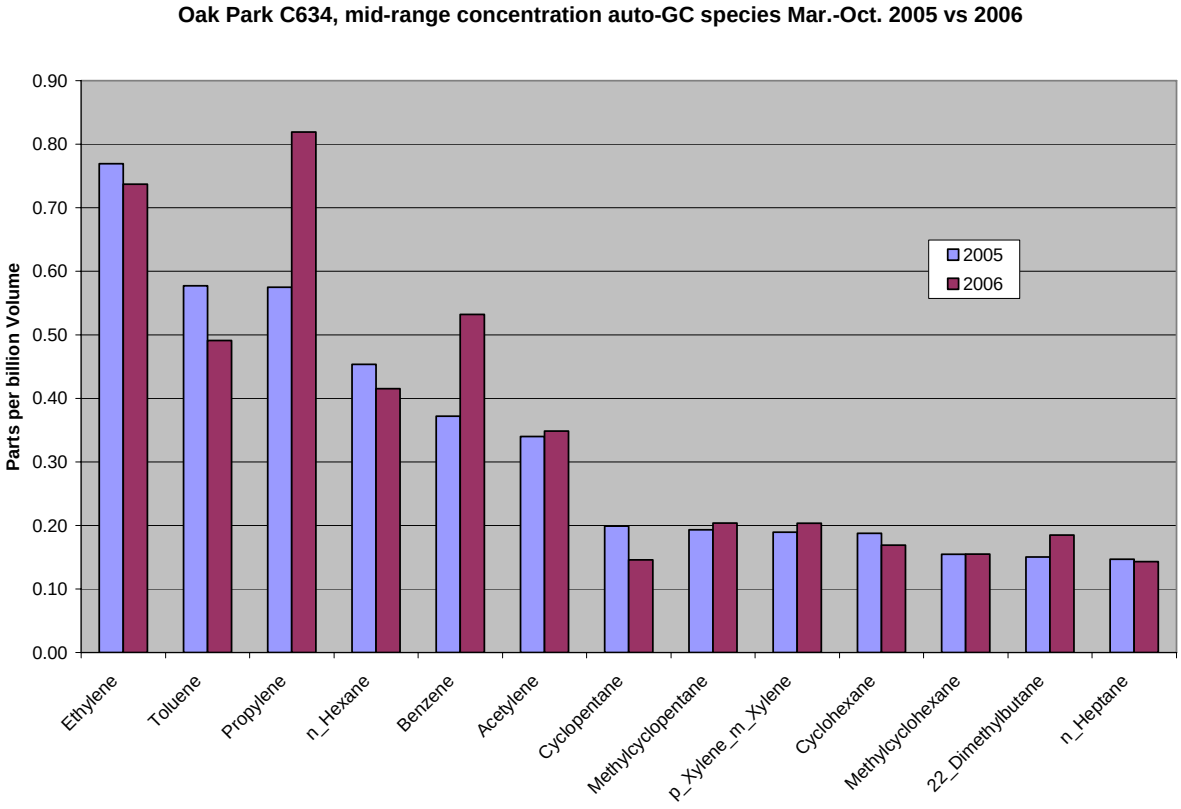


Figure 7b Lower concentration hydrocarbon species at Oak Park 2005 vs 2006 (ppbV)



For the months of September and October, which generally see more northerly winds, the results are less prominent. At Solar Estates C633, TNMHC mean and median mass are only slightly down (4 percent in mass), and only about one-third of individual species are lower in 2006 than in 2005. Benzene shows a slight increase. See Figures 8a and 8b, page 16.

Figure 8a Higher concentration hydrocarbon species at Solar Estates Fall 2005 vs Fall 2006

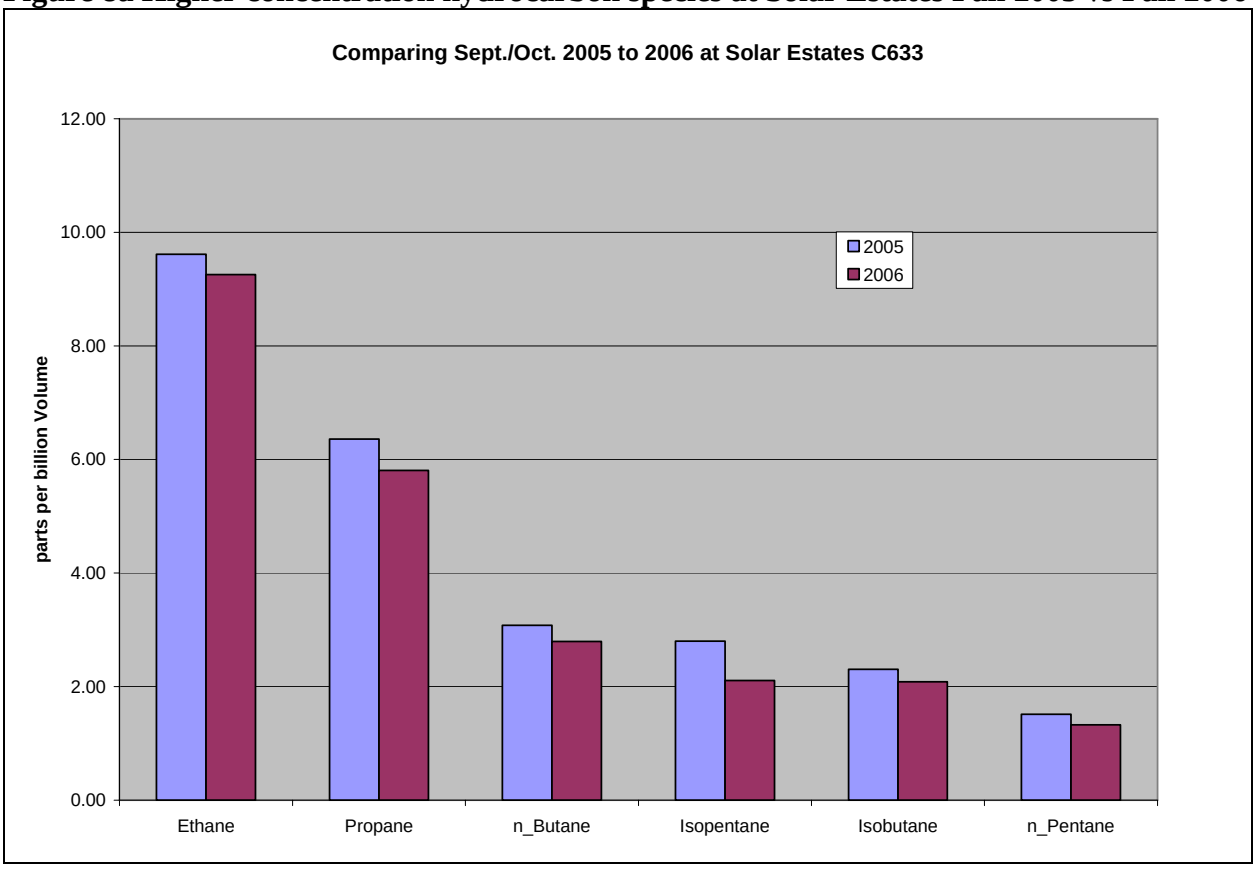
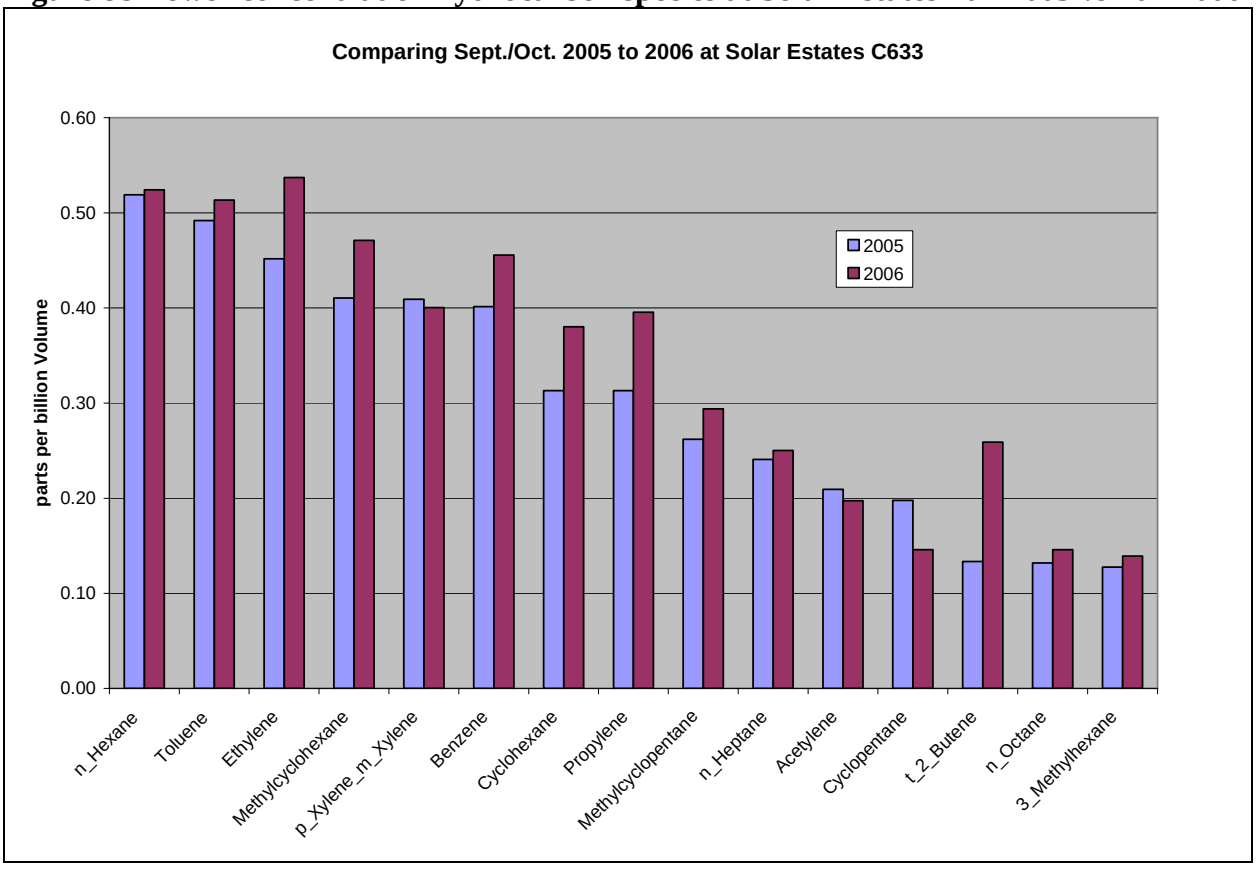


Figure 8b Lower concentration hydrocarbon species at Solar Estates Fall 2005 vs Fall 2006



At Oak Park C633 for September and October, about two-thirds of species have lower means but only a quarter have lower medians, and mean TNMHC is down 13 percent, but median TMNHC is virtually unchanged. Benzene is up by 31 percent. See Figure 9a, page 17 and Figure 9b, page 18.

Figure 9a Higher concentration hydrocarbon species at Oak Park Fall 2005 vs Fall 2006

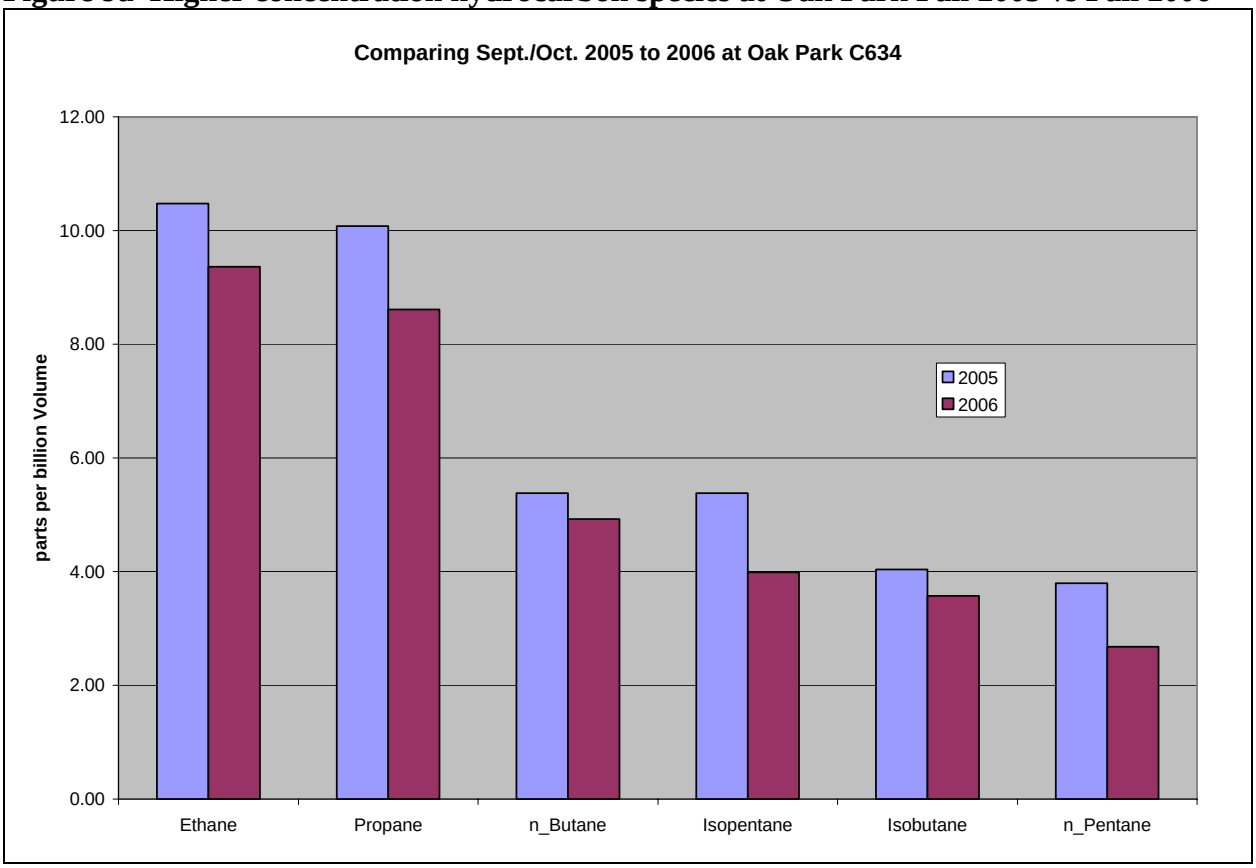
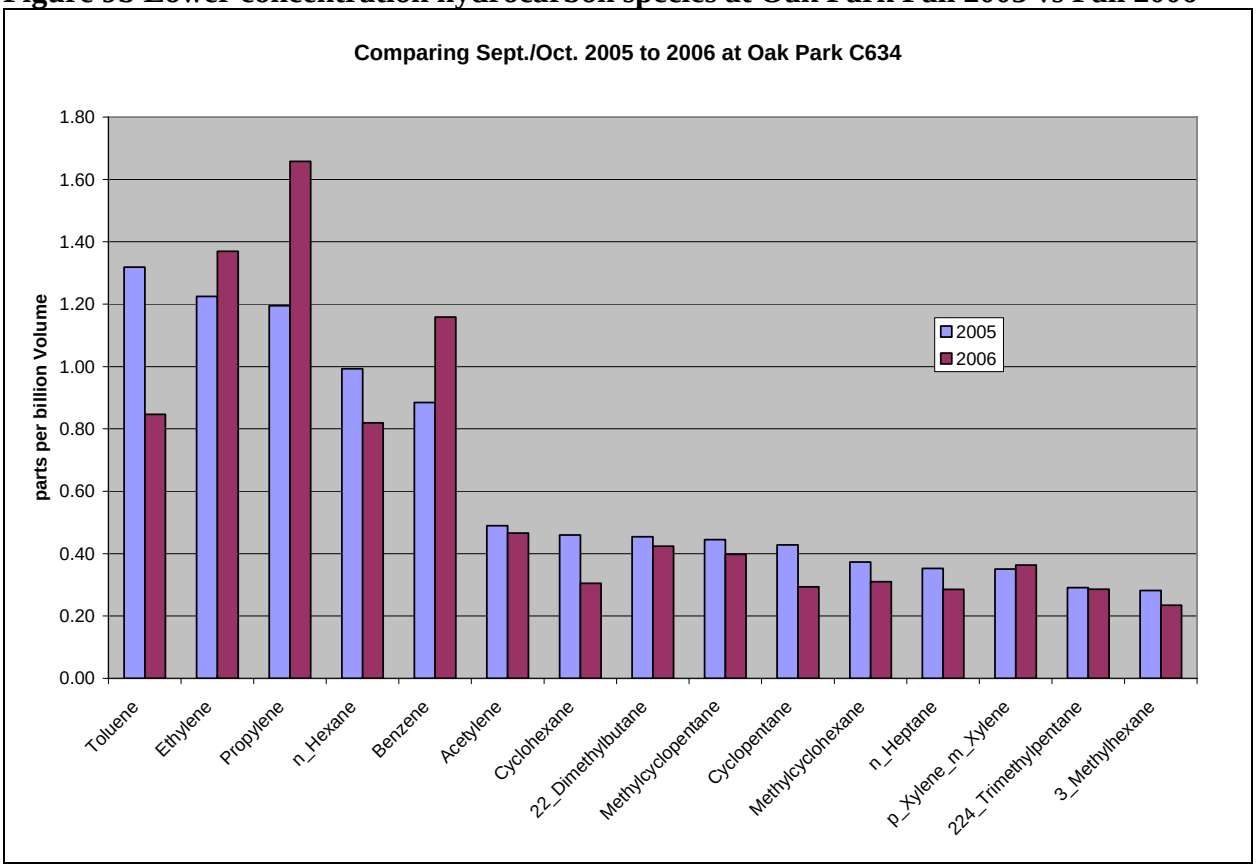


Figure 9b Lower concentration hydrocarbon species at Oak Park Fall 2005 vs Fall 2006



These are only the first steps to be taken in developing trend analyses. Subsequent work will be done to adjust the data for meteorological variation. In addition, as more past months of data are validated and more months of new data are collected, analyses will be repeated to more robustly assess trends.

Benzene Measured by Corpus Christi Auto-GCs

The auto-GC at Oak Park CAMS 634 (C634) has measured several one-hour benzene values higher than the TCEQ's one-hour ESL of 25 ppbV. The hourly observations of benzene plotted against date from March 2005 through October 2006 are shown in Figure 10, page 19, for Solar Estates C633 on the left and Oak Park C634 on the right. The graphs show that there are more measured concentrations above, say, 10 ppbV at Oak Park than at Solar Estates. Overall, the 12 month average from November 2005 through October 2006 is 0.74 ppbV at Oak Park and 0.32 ppbV at Solar Estates. For comparison, the annual ESL is 1.0 ppbV. Because these average values are small compared to the range of observations shown in Figure 10, page 19, it can be inferred that the vast majority of points are clustered relatively close to 0 in both graphs.

Figure 10 Time series of benzene at Solar (C633) and Oak Park (C634), ppbV units on y-axis

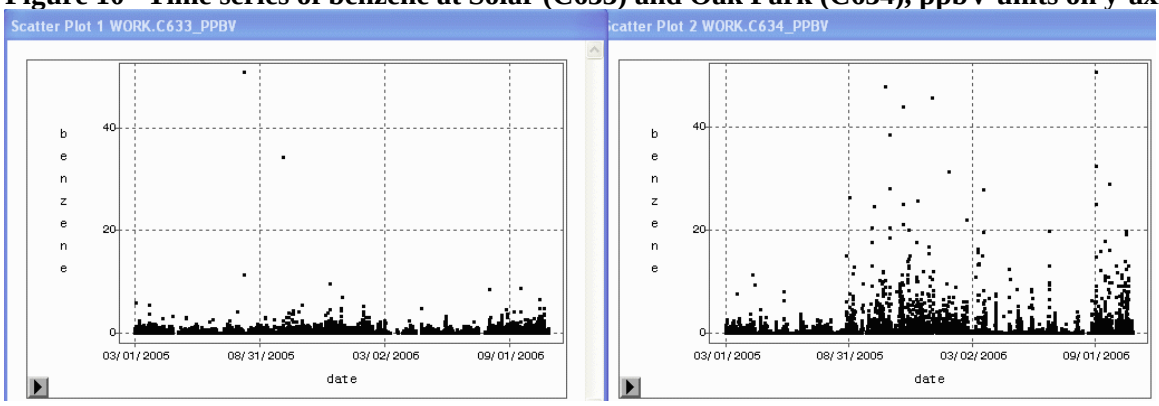


Figure 10, page 19, also suggests that at Oak Park the highest concentrations appear in the late and early parts of the year, as one can infer by noting the values above 20 ppbV between 8/31/2005 and 3/01/2005, and after 9/01/2006. (The tick marks are 183 days apart.) In Figure 11, page 19, the hourly observations are summarized into monthly mean and median statistics and are plotted against a "month/year" variable on the x-axis, with Solar Estates C633 on the left and Oak Park C634 on the right. (The tick marks are two months apart, covering 20 months from March 2005 – October 2006.) The peak average for Solar Estates to date is December 2005 for both the mean (0.5 ppbV) and median (0.35 ppbV), and the peak average for Oak Park is nearly tied between November and December 2005 (around 1.4 ppbV), with the median peak in December 2005 (0.7 ppbV).

Figure 11 Mean (red) and median (pink) benzene by month in ppbV units at Solar (C633) and Oak Park (C634)

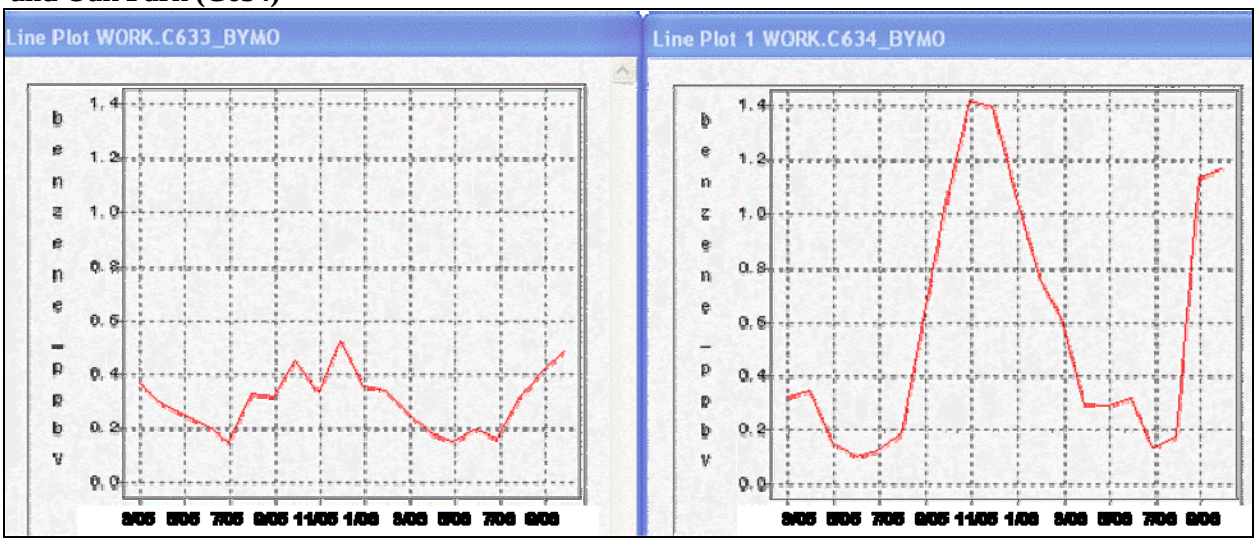


Figure 11, page 19, also shows that for Oak Park the mean concentrations by month in later 2006 months are generally higher compared to 2005. In Table 5, page 20, a side-by-side comparison of monthly means and medians appears for March through October. The larger of the pair for each month and statistic (mean or median) is bolded. At Solar Estates, there are small deviations on the order of 0.0-0.2 ppbV difference from month to month as far as which of the two years had higher mean or higher median. However, at Oak Park, September 2006 was 0.5 ppbV higher in mean concentration compared to a year earlier. The mean and median track each other at Solar Estates in Figure 11, page 19, but during the winter months a large gap grows between the mean and median at Oak Park, suggesting that many large outliers are affecting the mean.

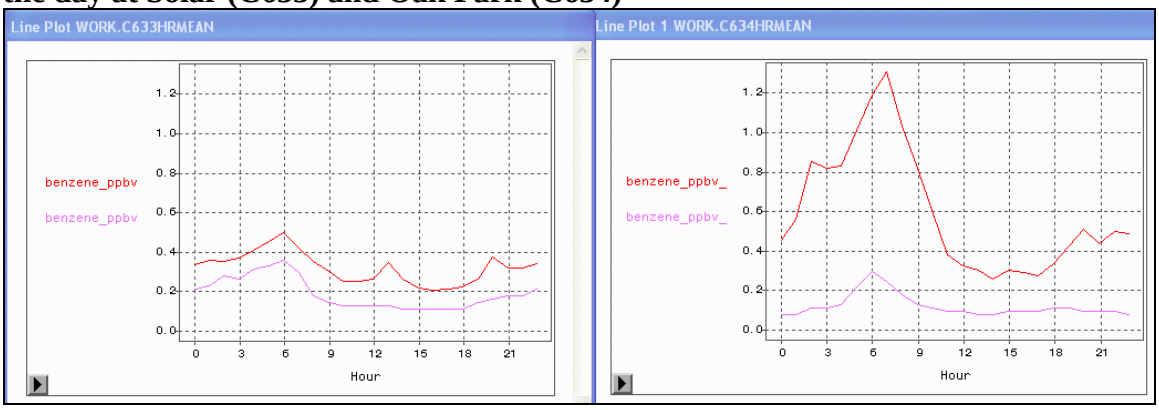
September may be especially susceptible to random changes in mean concentration for the following reason: a historical review of the wind direction pattern in Corpus Christi shows that in mid-September the area winds move from being predominantly southeasterly to more frequently northerly. A later or earlier onset of this change-over could have a large effect on how industrial emissions affect the monitor. A preliminary look at the wind direction data shows that about 7.5 percent of the September 2005 winds were northerly, but 17.1 percent of the September 2006 winds were northerly. Thus, all else equal, one would expect somewhat higher hydrocarbon measurements in September 2006 than September 2005.

Table 5 Mean and median statistics for benzene in ppbV units by month and year

	Solar Estates C633					Oak Park C634				
	mean		median			mean		median		
	2005	2006	2005	2006		2005	2006	2005	2006
March	**0.38**	0.26	**0.26**	0.11	March	0.33	**0.62**	**0.18**	0.10
April	**0.30**	0.19	**0.20**	0.07	April	**0.35**	0.30	**0.13**	0.08
May	**0.25**	0.16	**0.13**	0.08	May	0.16	**0.30**	0.07	**0.08**
June	**0.22**	0.20	**0.12**	0.10	June	0.11	**0.33**	0.03	**0.08**
July	0.15	**0.17**	0.05	**0.08**	July	0.13	**0.14**	0.05	0.05
August	**0.34**	0.32	0.13	0.13	August	**0.19**	0.18	0.05	0.05
Sept.	0.32	**0.42**	0.23	**0.27**	Sept.	0.63	**1.15**	0.12	**0.18**
Oct.	0.46	**0.49**	0.27	**0.30**	Oct.	1.08	**1.17**	**0.25**	0.22

Figure 12, page 20, shows the typical behavior of benzene over the course of a 24-hour period, with Solar Estates C633 on the left and Oak Park C634 on the right. (Tick marks are 3 hours apart.) These graphs were made by calculating the mean and median hourly values by hour of the day (using Central Standard Time). The graphs show that in the middle of the day, the two sites both have mean concentrations around 0.3 ppbV and median concentrations around 0.1 ppbV, but evening and morning concentrations are much higher at Oak Park. This may be due to higher emissions affecting Oak Park, but there may also be effects from the monitor being sited closer to Corpus Christi Bay and the fact that nighttime inversions may be shallower there, trapping pollutants close to the ground.

Figure 12 Mean (red) and median (pink) benzene concentration in ppbV units by hour of the day at Solar (C633) and Oak Park (C634)



As was noted earlier, the explanation for higher concentrations at Solar Estates and Oak Park in the late/early parts of the year is that this is the period with more frequent northerly winds. There appear to be two source areas to the north affecting Oak Park compared to one affecting Solar Estates, which may play a role in more frequent higher concentrations at Oak Park. To assess the effects of wind direction on concentration measurements, the hourly data for the auto-GCs and coincident/collocated wind speed and direction resultant hourly data have been merged.

In Figure 13, page 21, the mean and median benzene concentrations are graphed as a function of wind direction, where winds have been grouped into ten degree bins. Solar Estates' highest values are associated with sources centered near 50 degrees clockwise from north or roughly northeast (NE). Concentrations from those directions average close to 0.9 ppbV. Oak Park's highest values are associated with winds from around 20 degrees or roughly north-northeast (NNE), averaging 5 ppbV, with a second peak at 330 degrees or northwest (NW), averaging 2.8 ppbV. Aerial photographs of the areas around the two monitoring sites from the www.maps.google.com Web-site are shown in Figure 14 (Solar), page 21and Figure 15 (Oak Park), page 22. On each photo there are cones representing a 20 degree-wide upwind area centered on the key directions identified above.

Figure 13 Mean (red) and median (pink) benzene concentration in ppbV units by 10 deg. wind direction bin at Solar (C633) and Oak Park (C634)

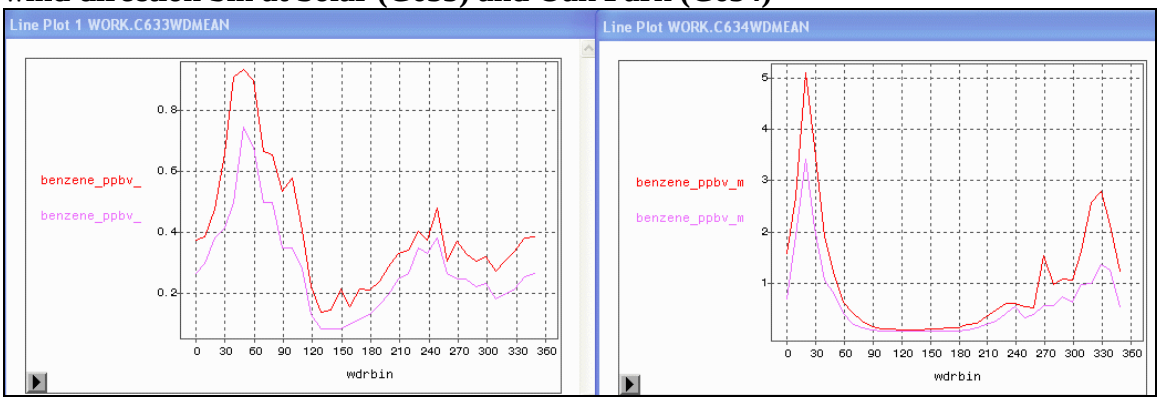


Figure 14 Aerial map at Solar with cone pointing to NE, peak general direction for benzene

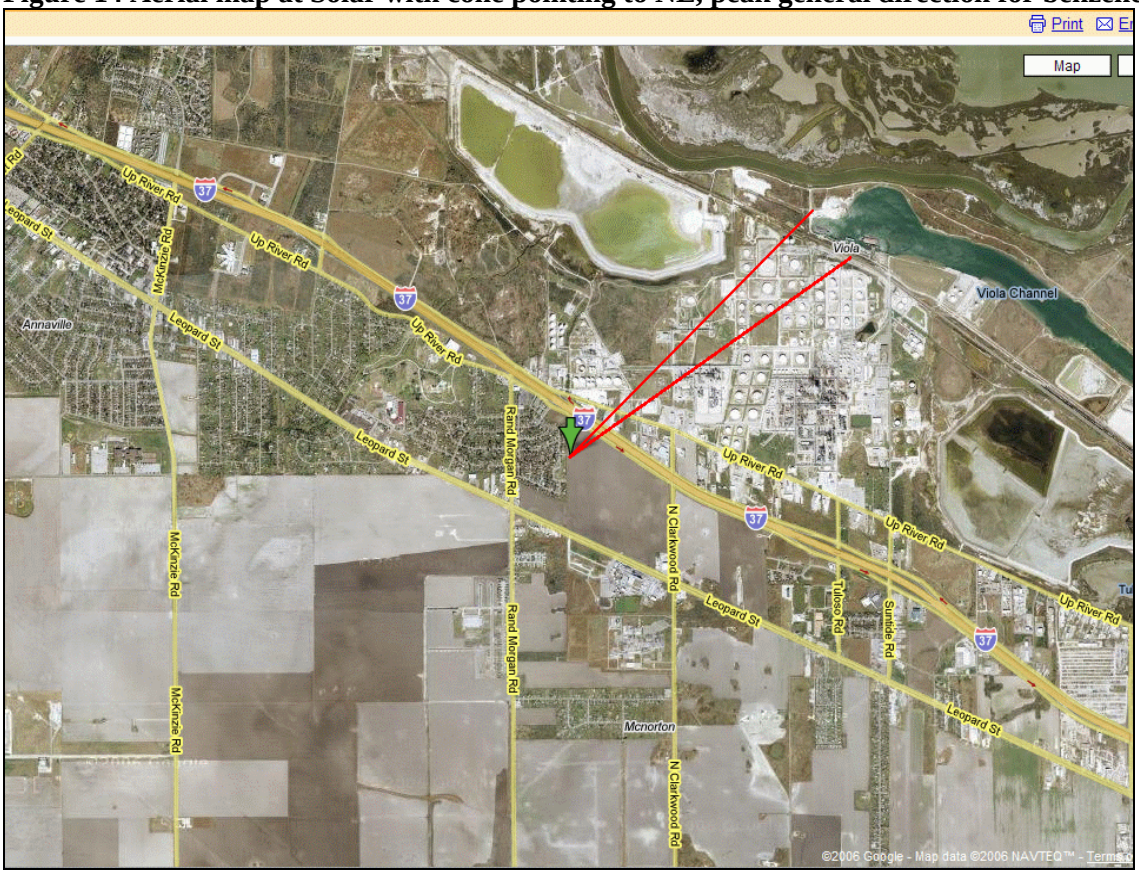
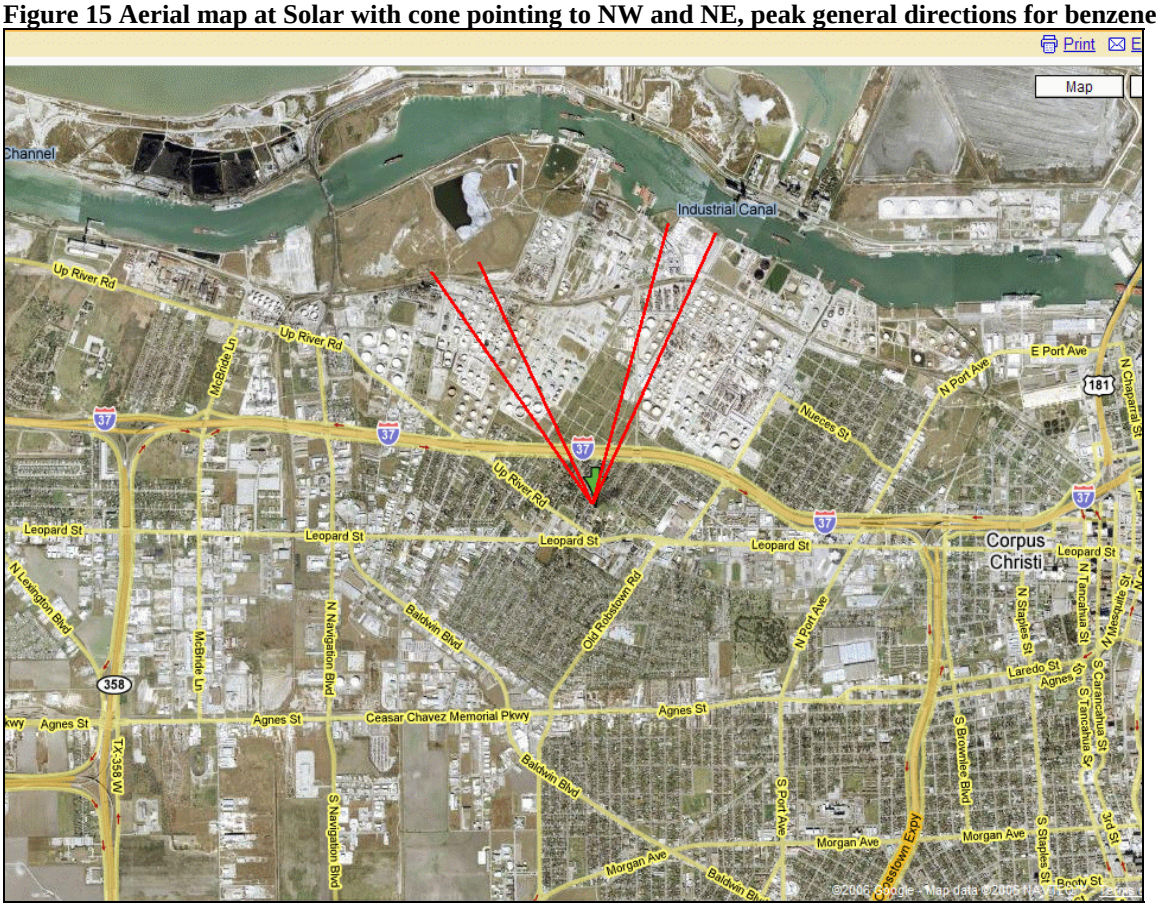
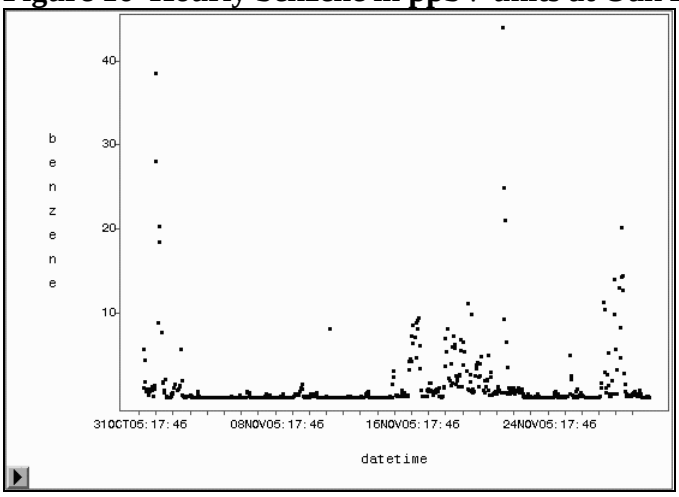


Figure 15 Aerial map at Solar with cone pointing to NW and NE, peak general directions for benzene



As was noted above, the highest monthly average benzene was recorded at Oak Park in November 2005, with a mean of 1.4 ppbV. The time series for this month alone appears in Figure 16, page 22. (Tick marks are every 24 hours.)

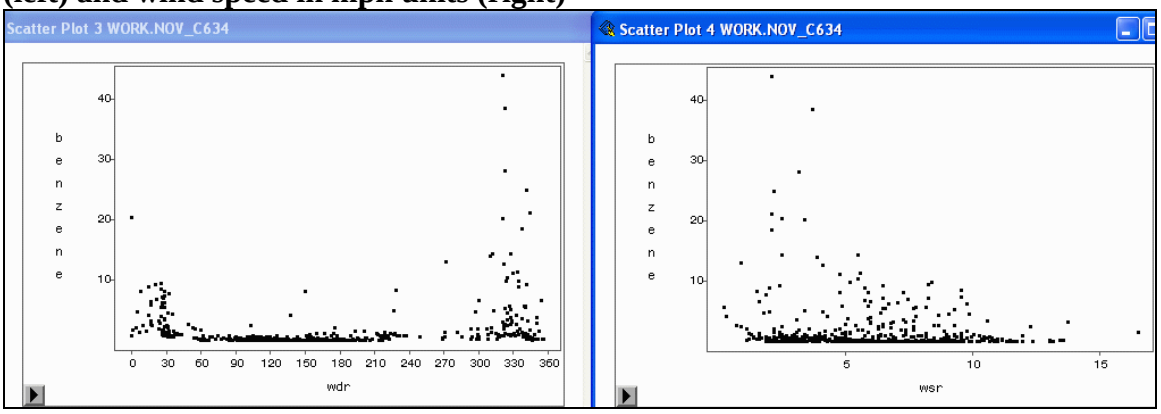
Figure 16 Hourly benzene in ppbV units at Oak Park in November 2005



In this shorter time scale, with only some 600+ observations, one can more easily study the actual observations instead of summary statistics. In Figure 17, page 23, the scatterplots for benzene at Oak Park in November 2005 and coincident/collocated wind direction (wdr) on the left and wind speed (wsr, in miles per hour) on the right. Again, one observes the two modes in direction: one near 20 degrees and one near 330 degrees appear. In this month the highest levels are associated with the 330 degree direction, whereas in Figure 13, page 21, the 20 degree

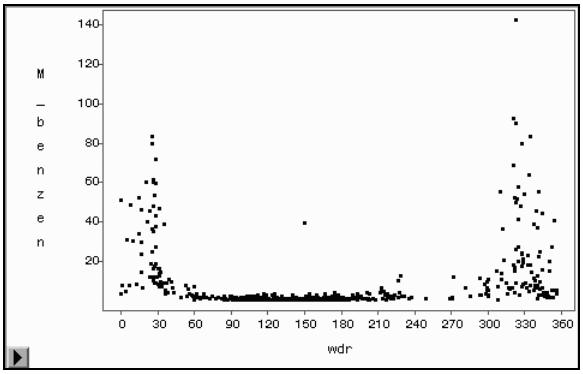
direction had the higher mean and median. One also observes that the highest concentrations are associated with low-speed winds.

Figure 17 Hourly Nov. 2005 Oak Park benzene in ppbV units vs wind direction in degrees (left) and wind speed in mph units (right)



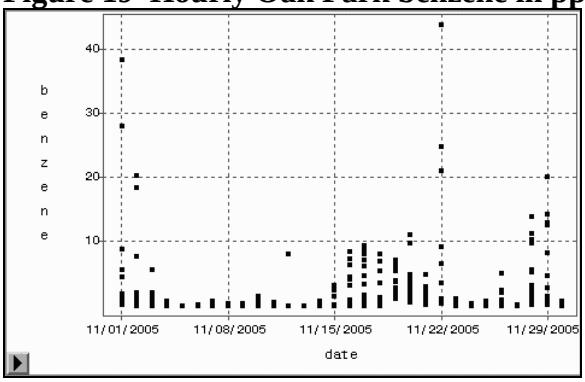
Often, in air quality research, pollutant concentrations are multiplied by the wind speed to partially correct for the dispersion and diffusion that normally occurs as a puff of polluted air moves along in the wind. In doing so, one is making a "first order correction" in trying to estimate what the upwind magnitude of emissions may have been. In applying this simple step to the November 2005 Oak Park data and graphing the product against wind direction, the graph in Figure 18, page 23, is produced. Interestingly, the higher wind speeds were apparently more associated with the NNE winds, because the observations of the product of speed times concentration from the NNE seem to be more on a par with the NW observations. This may suggest that the two source areas, if at similar upwind distances, may be closer in terms of emissions for this month than the concentrations suggest.

Figure 18 Product of benzene concentration times coincident wind speed vs wind direction, Nov. 2005 benzene at Oak Park



In Figure 19, page 24, the time series for November 2005 is simplified to graph all observations from a given day at the same point on the x-axis. Suppose one defines "elevated" benzene to be any concentration above 7 ppbV, which is ten times the current annual average concentration. Figure 19 page 24, allows one to easily identify days with prolonged elevated concentration, or series of such days. Thus, it appears that November 1-2, November 17-22, and November 28-29 all had periods of elevated benzene. Using the University of Texas Center for Energy and Environmental Resources Web-based back-trajectory tool, one can estimate the approximate potential upwind source areas.

Figure 19 Hourly Oak Park benzene in ppbV units plotted by day for Nov. 2005



In the next several pages, the one-hour back-trajectories from Oak Park on November 22, 2005 from midnight through 3 PM CST are shown in Figures 20-23, pages 25-28 respectively. They show the air flow changing hour by hour from westerly (00-06 CST) to northerly (07-14 CST) to easterly (15 CST). The hours with elevated benzene were 06, 07, 08, 09, 10 CST. The back-trajectory for 06 CST is at the top of the hour, and at 07 CST the winds had transitioned to the north. The sample was taken between 06 and 07, air samples having been time-tagged with the sample start time. The average wind direction during that hour was 322 degrees. Thus, the westerly trajectory labeled 06 CST and a northerly trajectory labeled 07 CST are consistent with an elevated benzene sample time tagged 06 CST. The air during this period appeared to have passed over the 330 degree NW direction identified earlier, consistent with the Valero East plant as a possible source. According to the TCEQ database on air emission events, however, there were no recoded events on Nov. 22.

The speciation of the samples taken on that day provides a visual of how the air looked different during the elevated benzene hours. The sample compositions are shown in Figure 24, page 29. Benzene appears in red. Hours 13 and 14 CST also have a strong benzene component under northerly winds, although the concentration was lower by that time. At hour 15 CST and later, winds had shifted to be easterly and later to be southeasterly

Figure 20 Back-trajectories from Oak Park hours 00-03 CST on 11/22/05

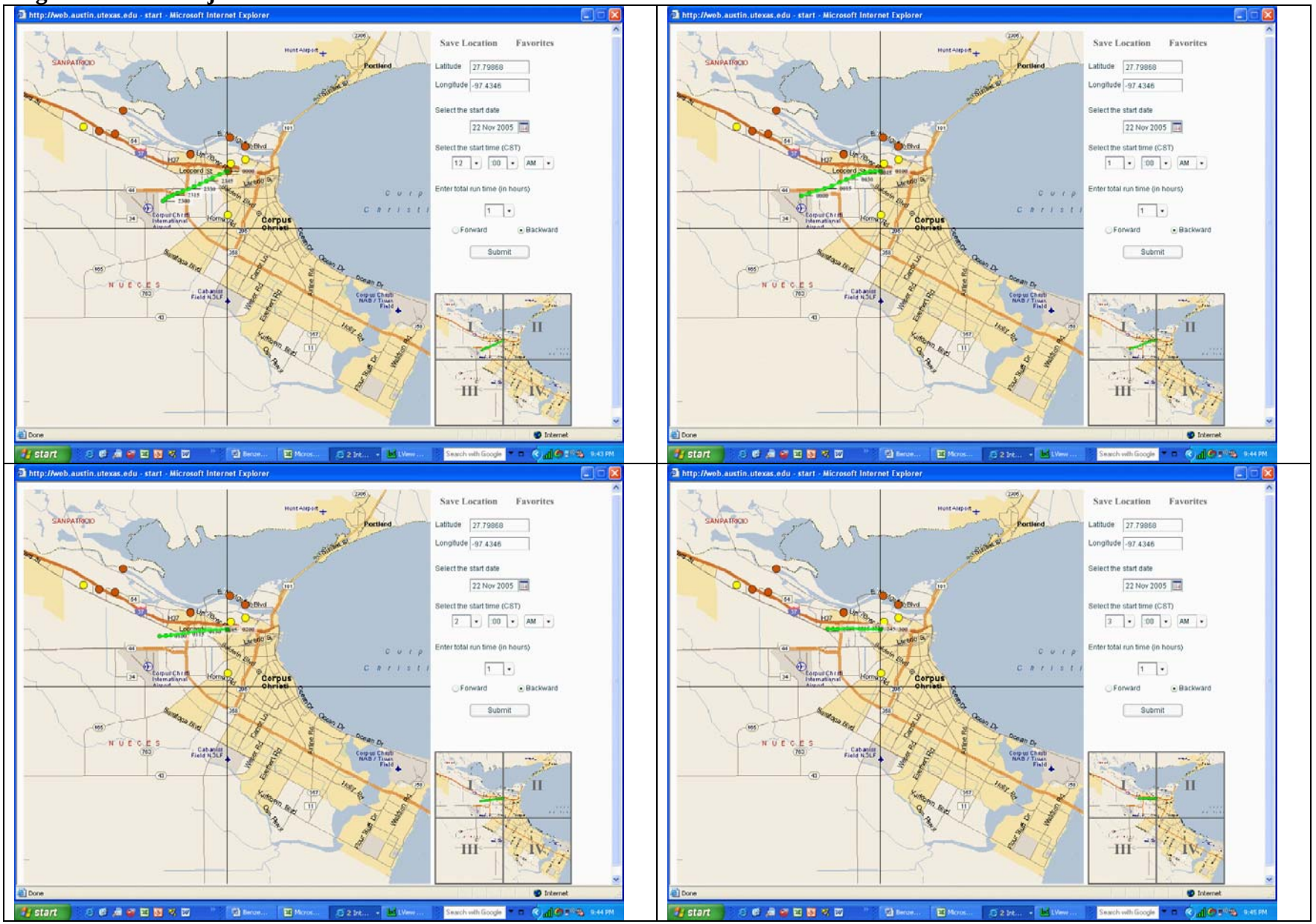


Figure 21 Back-trajectories from Oak Park hours 04-07 CST on 11/22/05

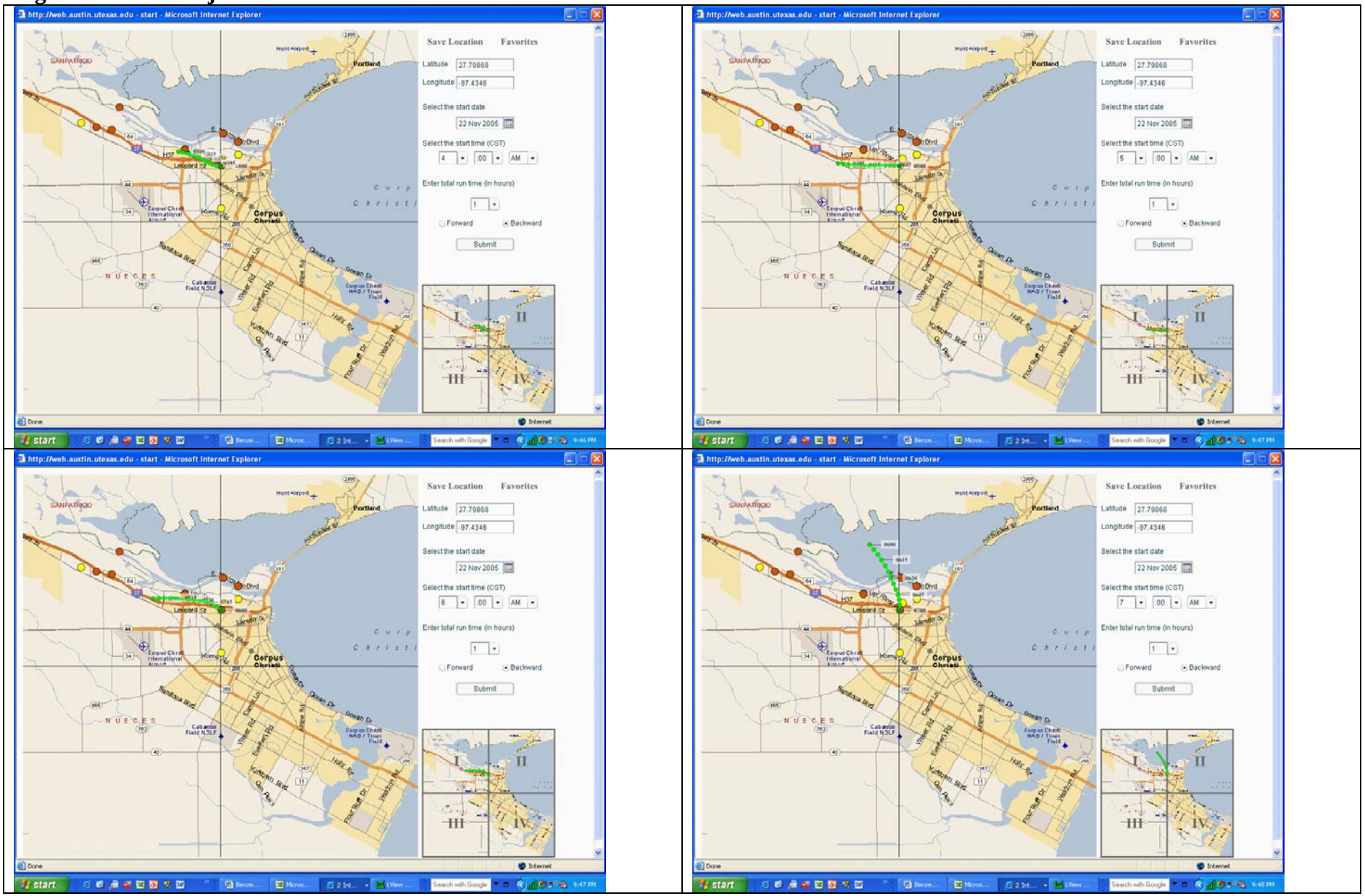


Figure 22 Back-trajectories from Oak Park hours 08-11 CST on 11/22/05

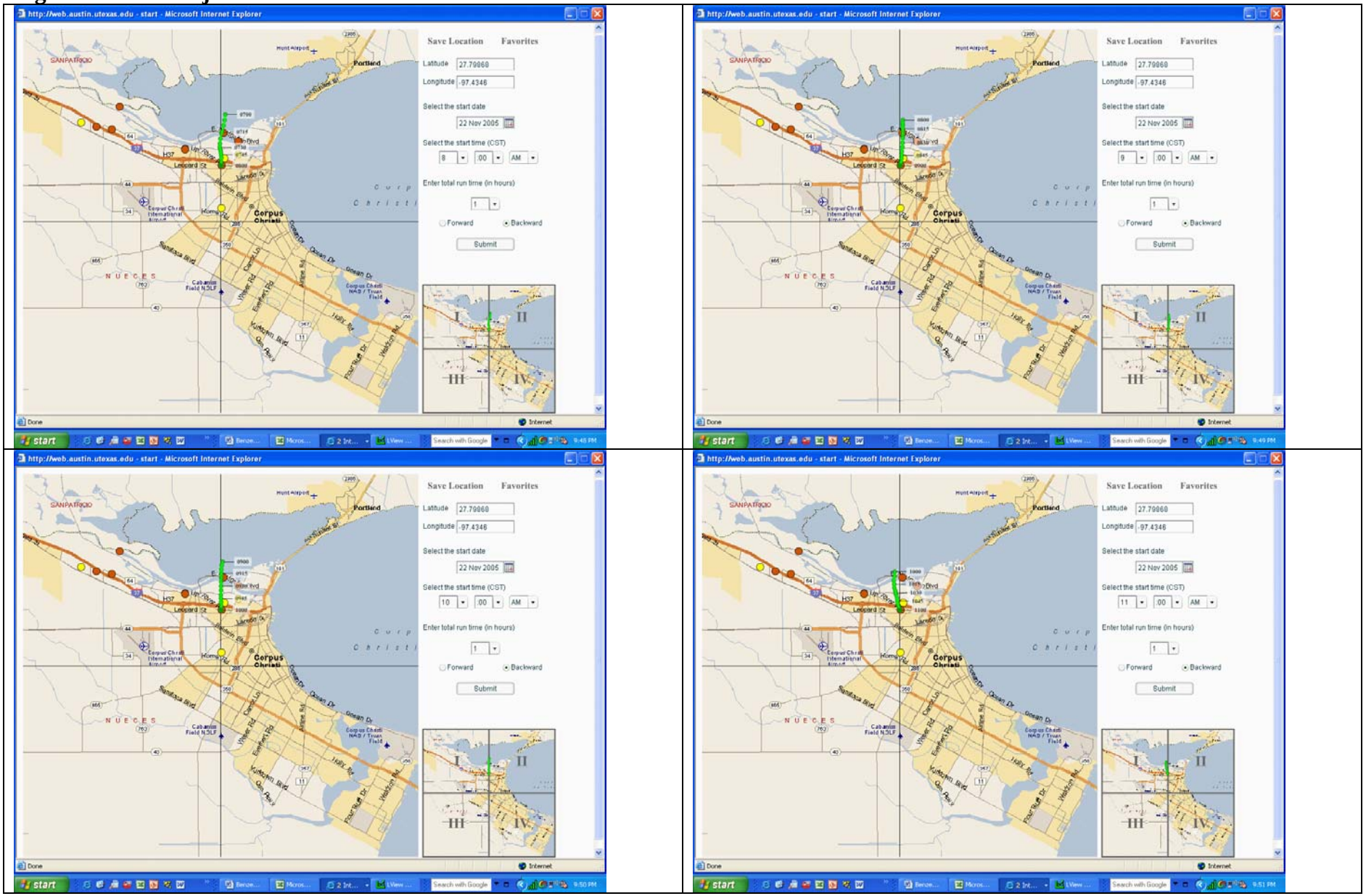


Figure 23 Back-trajectories from Oak Park hours 12-15 CST on 11/22/05

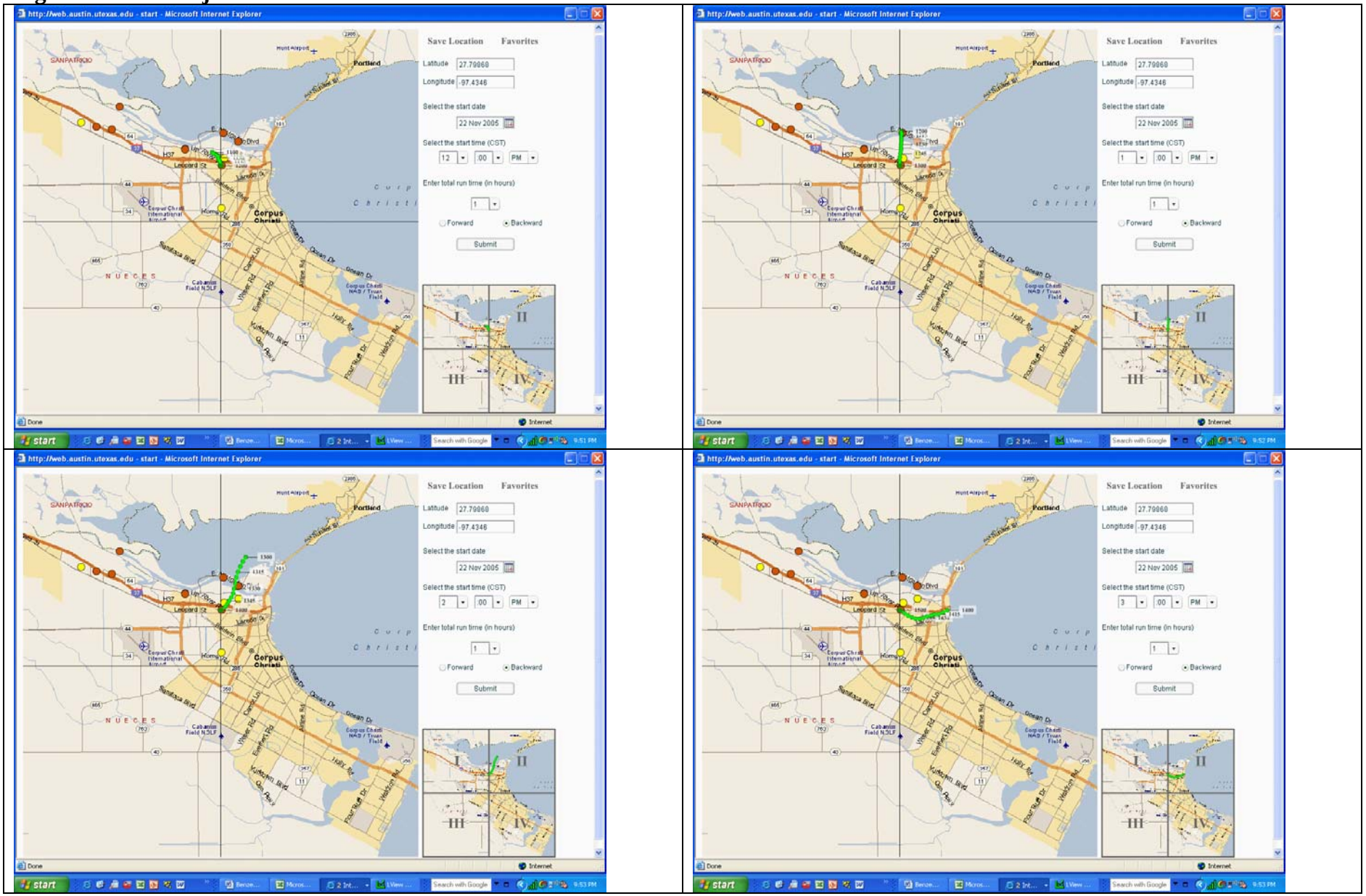
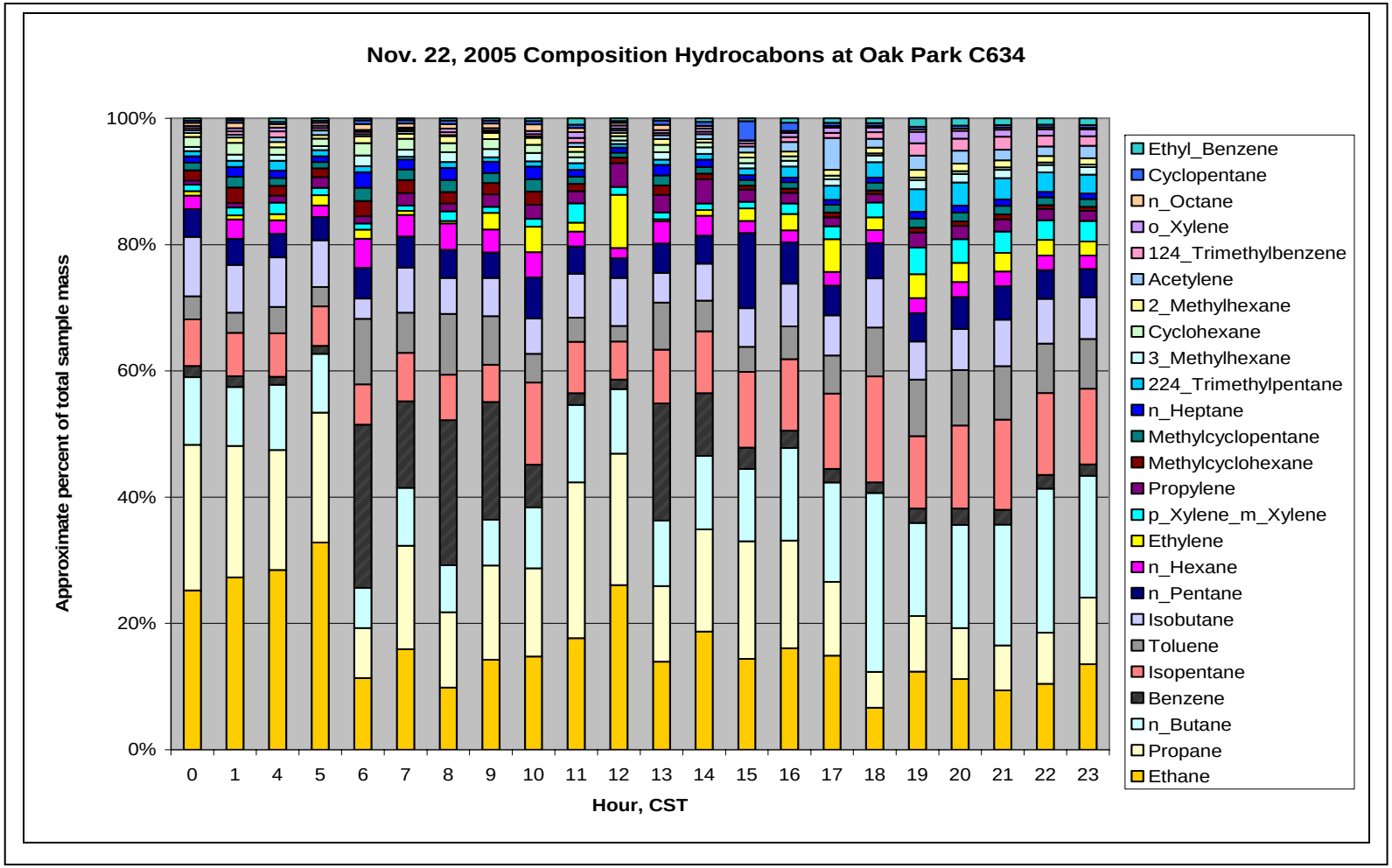


Figure 24 Composition of hourly samples – Benzene in stripes. Hours 2, 3 missing – daily quality assurance runs



Valero Fire Case Study Event

A notable event during the 2nd quarter of 2006 was a fire on the north side of the Valero plant west of Dona Park, which occurred on June 1. The location and viewing pattern of the camera system at Dona Park C635 proved to be highly valuable in capturing the start of the fire, which could be estimated to within seconds, and in helping to characterize it over time. The visible fire extended from 12:04 AM through 3:26 AM CST. However, hydrocarbon emissions from this fire were detected at all seven TNMHC monitors in the network and both auto-GCs over the course of the day. Evidence for relating the effects of the fire on specific monitors was provided by the on-line trajectory tool, which showed that a peak in TNMHC was measured at times roughly coincident with the passage of a plume modeled to have originated from the location of the fire. In addition, the composition of the speciated hydrocarbon mix at the two auto-GCs in the network showed strong agreement in measuring similar heavier molecular-weight compounds, again roughly coincident with the passage of the modeled plume. A canister sample was triggered at the Dona Park site -- roughly coincident with the modeled plume passage -- and it showed similar composition to the auto-GCs.

Figure 25, page 31, shows the camera view from Dona Park. The fire occurred in the right-hand one-third of the photo. Figure 26, page 31, shows on a log-scale the auto-GC data for Oak Park around 6:00 AM CST, and Figure 27, page 32, shows the same for Solar Estates around 1:00 PM CST. The high values at Solar Estates actually extended over two hours, some species having their peak an hour later. These two figures show the historic mean and the mean plus two standard deviations, to give a sense of the extreme nature of these hourly readings. All units are in ppbC, to allow summation to a total carbon-mass. For many heavier molecular weight species, the values measured during the peak hours were the maxima to date. The data are being reviewed by TCEQ toxicologists.

Figure 25 Dona Park Westerly Camera View

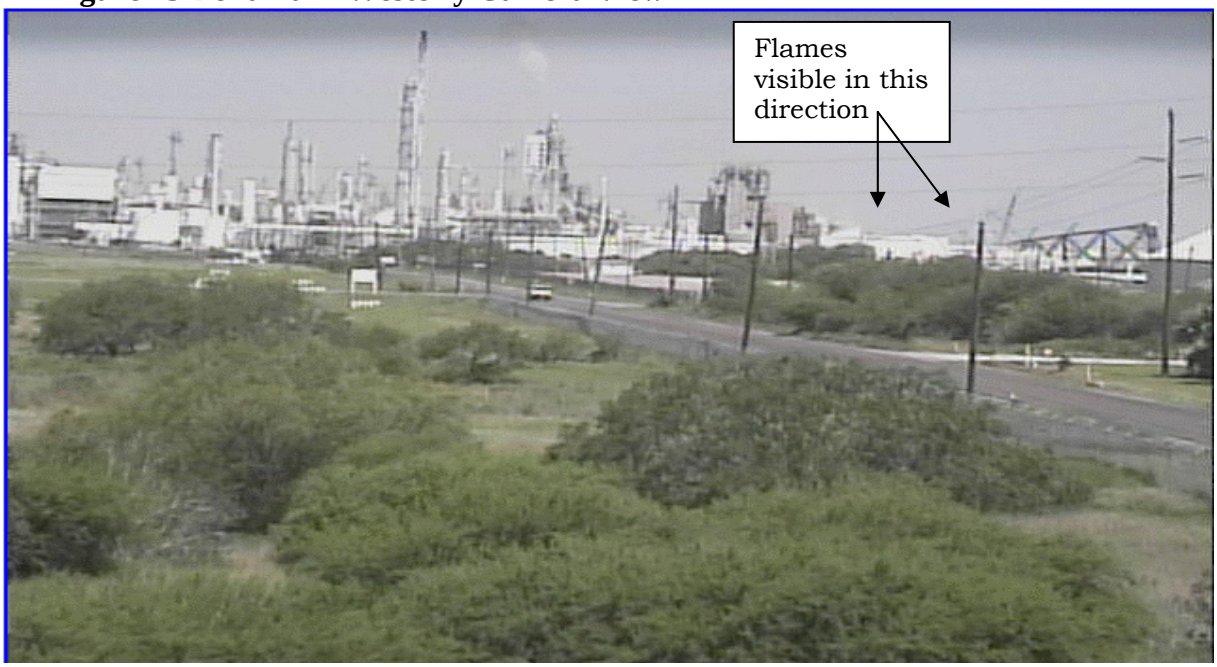


Figure 26

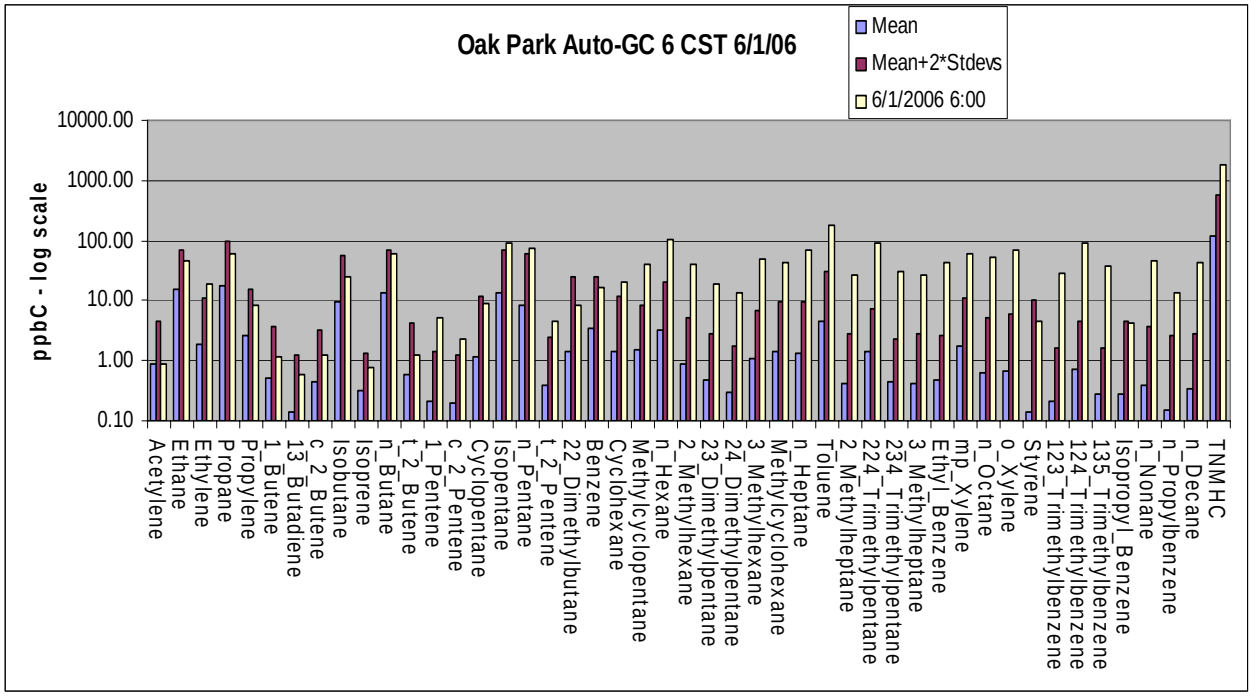
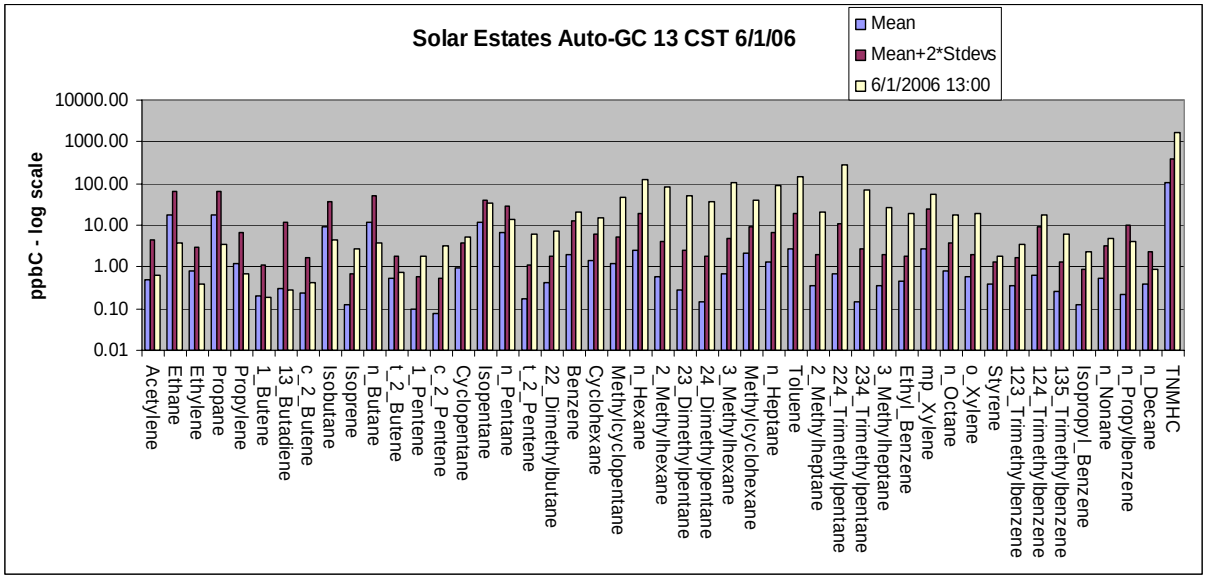


Figure 27



In Figure 28, page 32, and Figure 29, page 33, are shown the modeled back-trajectories from the two auto-GCs to demonstrate the corroboration between winds and concentration data. Each shows a one-hour surface back-trajectory from the monitoring site during the peak hour and depicts the air parcel passing over the Valero plant.

Figure 28 Surface Back-trajectory Oak Park 6:30 AM CST

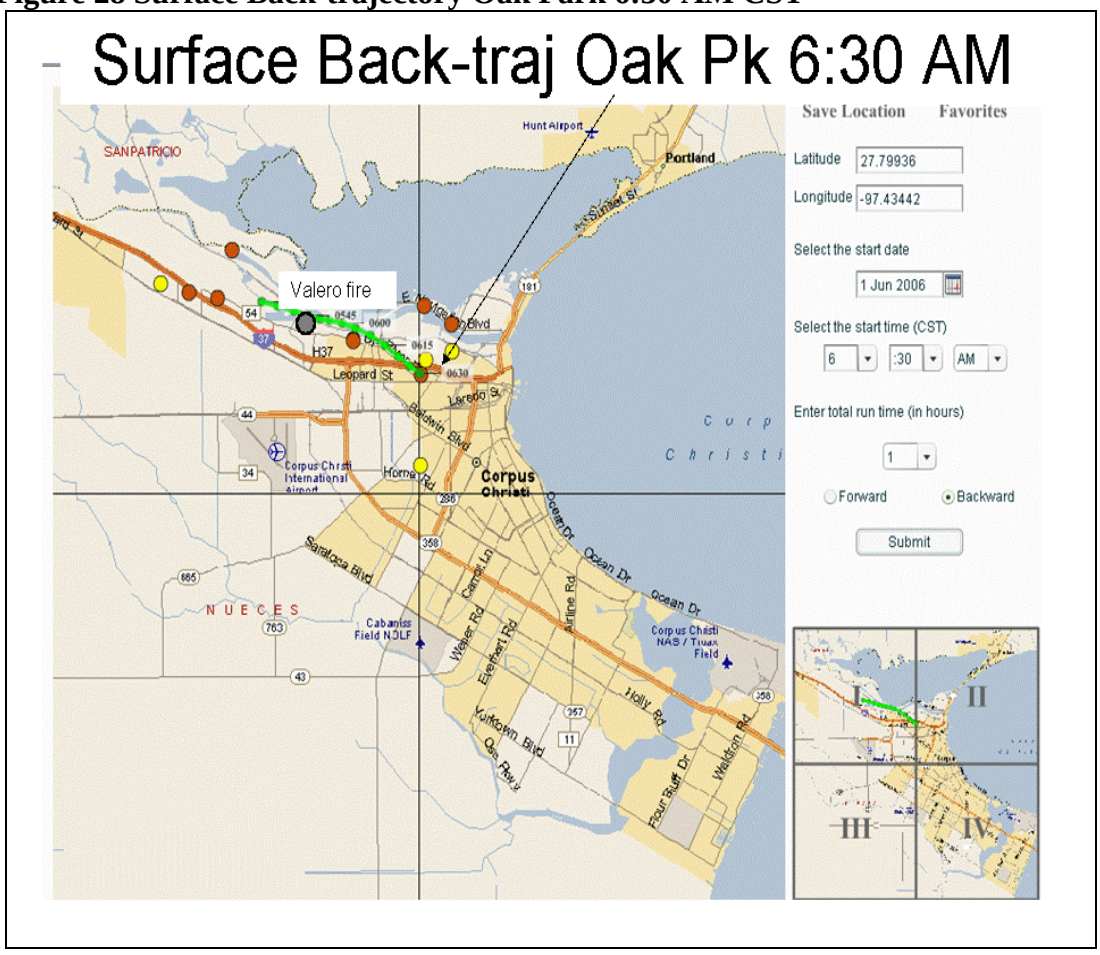
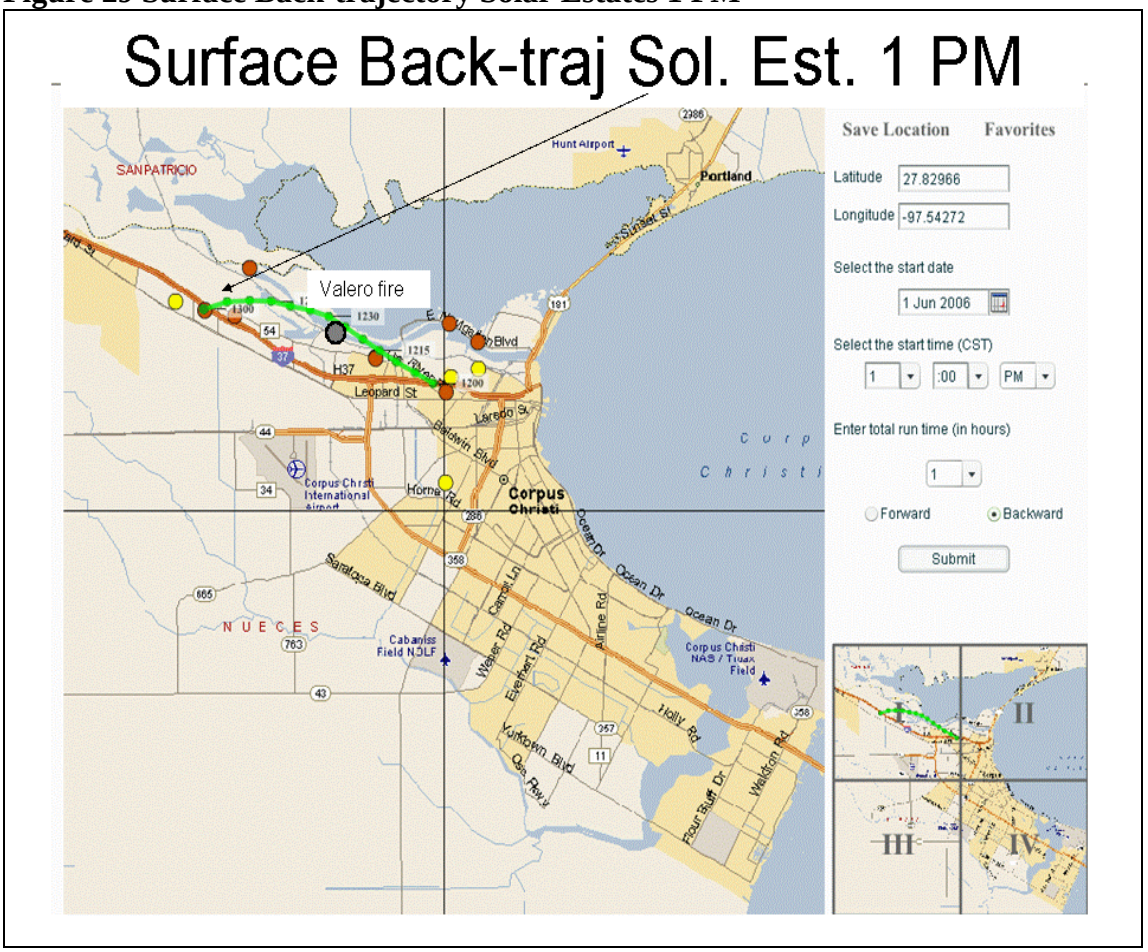


Figure 29 Surface Back-trajectory Solar Estates 1 PM



APPENDIX B

Financial Reports

ANNUAL REPORT
TO THE U.S. DISTRICT COURT
FOR THE
CORPUS CHRISTI AIR MONITORING AND SURVEILLANCE CAMERA PROJECT

Financial Summary

A. PROJECT EXPENDITURES

First Year Paid Expenditures	(10/2/03 - 9/30/04)	$ 663,448.81
Prior Year Paid Expenditures	(10/1/04 - 9/30/05)	$ 1,291,272.21
Current Year Paid Expenditures	(10/1/05 - 9/30/06)	$ 461,868.36
Current Year Encumbrances*	(10/1/05 - 9/30/06)	$ 70,044.87
Total Project Expenditures (including Current Year Encumbrances)	(10/2/03 - 9/30/06)	$ 2,486,634.25

***** Summary of Expenditures found in *Exhibit A*, page 36.

B COCP FUNDS REMAINING

Initial deposit on 10/2/03	$ 6,761,718.02
Less expenditures through 9/30/06	($ 2,416,589.38)
Less encumbrances through 9/30/06*	($ 70,044.87)
Plus interest earned as of 9/30/06	$ 385,672.80
Total	$ 4,660,756.57

COCP FUNDS REMAINING AS OF 9/30/06 $ 4,660,756.57

* Some expenses incurred during Year 3 of the Project have not been billed by University vendors or subcontractors and/or approved for payment so those charges were not posted to the general ledger as of 9/30/06. Those encumbered charges are estimated to be $70,044.87.

EXHIBIT A

Corpus Christi Air Monitoring and Surveillance Camera Installation and Operation Project

Expenditure Summary for the Project Period 10/2/03 through 9/30/06

DESCRIPTION	Budget Allocation through Year 3	Prior Year paid Expenditures	Current Year paid Expenditures	*TOTAL EXPENDITURES	*BALANCE AVAILABLE*
SALARIES & WAGES	216,128.63	(71,212.90)	(92,164.79)	(163,377.69)	*52,750.94*
CEER ADMIN SALARIES	19,606.37	(4,731.90)	(14,751.01)	(19,482.91)	123.46
FRINGE BENEFITS	47,984.00	(15,943.30)	(19,288.62)	(35,231.92)	*12,752.08*
SUPPLIES & Lab Analysis	60,474.00	0.00	(25,810.00)	(25,810.00)	34,664.00
OTHER EXPENSES	86,844.00	(9,625.08)	(45,450.39)	(55,075.47)	*31,768.53*
SUBCONTRACT	1,965,693.00	(1,597,090.00)	(211,627.09)	(1,808,717.09)	*156,975.910*
TRAVEL	2,300	(1,154.22)	(365.94)	(1,520.16)	779.84
EQUIPMENT	0.00	0.00	0.00	0.00	0.00
TOTAL DIRECT COSTS	2,399,030.00	(1,699,757.40)	(409,457.84)	(2,109,215.24)	289,814.76
INDIRECT COSTS **/15% TDC**	359,855.00	(254,963.62)	(52,410.52)	(307,374.14)	*52,480.86*
TOTAL EXPENDITURES	**$2,758,885.00**	**($1,954,721.02)**	**($461,868.36)**	**($2,416,589.38)**	**$342,295.62**

* Some expenses incurred during Year 3 of the Project have not been billed by University vendors or subcontractors and/or approved for payment so those charges were not posted to the general ledger as of 9/30/06. Those encumbered charges are estimated to be $70,044.87. When received and approved, those charges will be paid from the available balance.

CORPUS CHRISTI AIR MONITORING AND SURVEILLANCE CAMERA PROJECT

University of Texas at Austin
Annual Audit Report Results

Period: October 1, 2005 - September 30, 2006

The University's Annual Reports and Audit Statements are made available for public review at the following website:.

http://www.sao.state.tx.us/reports/ Select the Statewide Reports link.

http://www.sao.state.tx.us/reports/main/06-325.pdf Federal Portion

Attached is a copy of The University of Texas at Austin's Certification Statement for the Office of Management and Budget (OMB) Circular A-133 Audit conducted during the 2004/2005 fiscal year. The OMB Circular A-133 Audit for the 2005/2006 fiscal year is currently being conducted. The results of the 2005/2006 Audit will be made available at the above website. It is anticipated the audit results will be posted in late Spring, 2006.

SUBRECIPIENT AUDIT FORM

(including financial reports and internal controls)

FOR FISCAL YEAR ENDING AUGUST 31, 2005

SUBRECIPIENT'S LEGAL ENTITY NAME AND ADDRESS

The University of Texas at Austin
Office of the Controller
The University of Texas at Austin
P.O. Box 7159
Austin, TX 78713-7159

☒ Our audit report for the subject fiscal year has been completed. Reportable conditions, instances of noncompliance, or findings related the management of sub-award(s) made to the University of Texas at Austin were noted.

Attached is a listing of findings and current course of action by the University to address noted concerns for the Research and Development Cluster. Additional findings related to Federal financial aid were also noted during the audit. A complete listing of the non-Research and Development related findings is available in the Federal portion of the report; a link is provided below.

A complete copy of the State of Texas Federal Portion of the Statewide Single Audit Report For the Fiscal Year Ended August 31, 2005 (Report Number 06-325) can be viewed at

http://www.sao.state.tx.us/reports/main/06-325.pdf Federal Portion

Or at http://www.sao.state.tx.us/reports/; select the Statewide Reports link.

Authorizing Signature: _____ **Date:** 3/17/06

Fred Friedrich
Associate Vice President and Controller

Research and Development Cluster

Reference No. 06-63
Matching and Program Income
(Prior Audit Issue – 05-57, 04-53, 03-09, and 02-48)
Material Weakness Control

The University's process of monitoring Matching and Program Income was questioned; however, the audit did not cite compliance as an issue on any specific award and there were no questioned costs. While the University has made annual improvements to this process, an initiative is underway to ensure that all awards with "mandatory" cost sharing or matching requirements are identified for report purposes.

Reference No. 06-64
Procurement and Suspension and Debarment
(Prior Audit Issue – 05-55)
Reportable Condition Control and Non-Compliance

The auditor noted that the University failed to verify suspension and debarment status on blanket purchase orders for two vendors; however, auditor review of the vendors in the Excluded Parties List System found neither vendor was suspended or debarred. The University has revised its policy to instruct buyers to determine vendor status for all blanket order purchases. Only two awards, one from NIH and one from NSF, were cited as related to this finding; there were no questioned costs.

Implementation of the policy change occurred during fieldwork and resolves this audit issue.

Reference No. 06-65
Subrecipient Monitoring
Reportable Condition Control and Non-Compliance

The auditor noted that the University failed to obtain A-133 audit certification statements or other evidence that the required A-133 audits were performed. The University has a policy to obtain audit documentation as required under A-133 and has performed the necessary follow-up with the subrecipients and verified there were no findings related to sub-awards issued to them from the University of Texas at Austin. There were no questioned costs by the auditor.