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Summary of Data Validation of 2001 Auto-GC Data

**Interim Report
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1. INTRODUCTION

As a part of Task 1 of this work assignment to acquire, review, and analyze automatic gas chromatograph (auto-GC) data collected in Houston from 1998 through 2001, this interim report documents the data availability, completeness, and validation results for the 2001 data. We previously reported on the 1998 through 2000 data (Main et al., 2001).

2. DATA AVAILABILITY AND COMPLETENESS

Hourly auto-GC data were collected at a variety of sites in 2001. Data were collected year-round at Clinton and Deer Park and from August through October 2001 at Channelview, HRM-3 Haden Road, and HRM-7 Baytown. STI received data only for the months of August-October from every site. **Table 1-1** details the operational period at each site and the expected versus available data received from the August-October period; **Table 1-2** shows the times and dates of missing auto-GC data for the same period. Note that there are a number of gaps in the available data; the percentage available is equal to the number of hourly samples divided by the number of expected hourly samples during period in which the site was operational. We assumed that there were 22 hourly samples in a given day, and the two remaining hours were devoted to calibrations (no data reported).

Table 1-1. Table of expected and available auto-GC data (concentration) from August through October 2001.

Site	TNRCC Site Code	Operational Period	Number of Hourly Data (1 day=22 sample hours, 2 calibration hours)		
			Expected	Available	% Available
Channelview	C15/C115	8/4-10/31	1958	1525 ^a	78
Clinton	C403/C113/C304	8/1-10/31	2024	1820	90
Deer Park	C35/C139	8/1-10/31	2024	1697 ^b	84
HRM-3 Haden	C603/C114	8/21-10/31	1584	1355 ^c	86
HRM-7 Baytown	C148	8/27-10/31	1452	1295 ^d	89

^a 97 of these hours have no TNMOC data with which to calculate weight percent (73 % availability).

^b 60 of these hours have no TNMOC data with which to calculate weight percent (72 % availability).

^c 266 of these hours have no TNMOC data with which to calculate weight percent (69% availability).

^d 82 of these hours have no TNMOC data with which to calculate weight percent (84% availability).

Overall, there is a good data availability with more than 75% completeness over the three-month operational period. In addition to times missing all data, the total non-methane organic carbon (TNMOC) data were unavailable for an additional amount of time at each site, with the exception of Clinton. The lack of TNMOC¹ data reduces the availability of data for

¹ Note that TNMOC is the PAMS definition (sum of all mass, identified and unidentified peaks, from C2 through C12 hydrocarbons, AIRS code 43102). This quantity is often referred to as nonmethane hydrocarbon (NMHC).

weight percent and reactivity-weight conversion and analysis. Other data availability issues include the following missing data:

- propylene on three days at Channelview;
- isoprene and 1,2,3-trimethylbenzene for two weeks and n-octane for a number of days at HRM-7; and
- benzene, toluene and xylenes at HRM-3 for two days.

When abundant species (e.g., benzene or toluene) or highly reactive species (e.g., propylene or xylenes) are missing, calculations of TNMOC, weight percents, and reactivity weights will generally not be accurate due to the incompleteness of the data. Therefore, weight percents and reactivity weights are also suspect when these important species are missing.

Table 1-2. Times and dates of missing auto-GC data from August through October 2001.

Site	Year	Dates	Comments
Channelview	2001	8/17 0100-8/21 1100 8/22 0000-8/27 0900 9/4 0500-1300 9/12 1500-9/13 1700 9/18 1000-9/19 1500 9/24 1700-9/25 1300 9/26 0000-1100 9/27 0000 -10/1 1000 10/12 0000-2300 10/16 0900-1200	All Data Missing
		8/16 0000-2300 8/21 0000-2300 8/27 0000-2300	No Propylene
		10-1 1000-10/3 1200	No TNMOC
Clinton	2001	8/30 1200-9/2 0400 9/5 0800-1200 9/18 0000-0900 9/21 1200-9/24 1200 10/8 0000-1000 10/27 0300-10/29 1300	All Data Missing

Table 1-2. Times and dates of missing auto-GC data from August through October 2001.

Site	Year	Dates	Comments
Deer Park	2001	8/7 0000-1300 8/15 0900-1200 9/5 0600-0900 9/9 0900-1200 9/25 0000 -10/1 0100 10/4 0000 -10/5 0900 10/13 0000 -10/14 1200 10/14 1300-2300 10/15 0000-0800 10/16 0800 10/18 0000 -10/22 1200	All Data Missing
		10/1 0000 -10/2 1300 10/14 0000 -10/16 0900 10/22 0900-10/23 1200	No TNMOC
HRM-3 Haden Rd.	2001	8/30 0700 9/2 1200 9/5 1100,1300 9/6 0000-9/11 0200 9/14 1900 9/17 1300 9/20 0800-1500 9/21 1500-9/24 1500 9/25 2000 9/26 1500 9/27 1000 10/2 1100-1700 10/18 1000,1200-1500 10/23 0000-0900	All Data Missing
		8/21 0000 - 8/28 0600 9/5 0000-2300 9/24 1400-9/26 1900 10/22 0000 - 10/24 1200	No TNMOC No TNMOC No TNMOC, Benzene, Toluene, Xylenes No TNMOC

Table 1-2. Times and dates of missing auto-GC data from August through October 2001.

Site	Year	Dates	Comments
HRM-7 Baytown	2001	8/28 0700, 0900	All Data Missing
		8/31 1100-1600	
		9/1 0000 - 9/5 0400	
		9/5 1300	
		9/6 0800	
		9/18 1200-1700	
		9/19 0500-0800	
		9/20 1800-2300	
		9/21 0900-1900	
		9/26 0700	
		10/6 2000-2300	
10/11 0000-2300	No TNMOC		
8/27 0000-2300			
8/29 0000-2300			
10/12 0000 - 10/13 0900	No isoprene		
9/15 0000 - 9/30 2300			
9/21 0000 - 9/24 2300	No n-octane		
9/5 0000 - 9/19 2300	No 1,2,3-trimethylbenzene		

3. DATA QUALITY

The overall quality of the data was very good because the data had been previously validated by TNRCC staff. STI subsequently ran a number of the Level 1 screening checks using VOCDat, including inspection of the data for evidence of calibration carryover, high or negative unidentified values, the same concentration over several hours, peak misidentification, and zero concentration values.

We used a list of data failing screening criteria to aid in more detailed inspections of the data. **Table 1-3** summarizes the dates and times of data failing pertinent screening criteria for each site. VOCDat was also used to perform visual review of the data using scatter, time series, and fingerprint plots with a focus on the time periods surrounding the data that failed screening criteria:

- Scatter plots were used to investigate the relationship between species. We prepared the following scatter plots: benzene versus toluene and acetylene; propane versus propene; ethene versus propene; i-butane versus n-butane; 2-methylpentane versus 3-methylpentane; m-&p-xylenes versus o-xylene; and n-pentane versus i-pentane. The scatterplots were used to look for correlations as well as outliers.

- Time series plots were used to investigate the concentrations of species in every sample over a specified time period. These plots are useful in showing the diurnal behavior of a species. Time series plots of all species, plotting several species at a time, were inspected to find time periods and samples that warranted additional inspection.
- Fingerprint plots were inspected for the concentration of each species in a sample (in chromatographic order) to help identify unique characteristics of the samples. We particularly a focused on samples identified as “odd” in other plots or data screening.

Appendix A provides a detailed list of individual samples, including our comments, that we flagged as suspect as a result of the above inspections. Similar to instances of missing data, samples in which abundant or highly reactive species have concentrations of zero make the weight percents and reactivity weights suspect.

Table 1-3. Summary of data from the August-October 2001 operational period that failed screening criteria.

Site	Dates and Times	Comments	Action Performed
Channelview	8/16, 8/21, 8/27 All samples	No propylene	Entire sample flagged
	10/2/01 1400-1600, 10/13/01 0200-0900	No ethane, propane, n-butane, n-pentane, isopentane, n-hexane, benzene	Entire sample flagged
	Many samples	Ethene>ethane, propene>propane, benzene>toluene	Probably real due to dense industry, no action taken
	Many samples	3-methylpentane=0	Species flagged
	10/2/01 1400	Zero concentration of toluene, xylenes	Entire sample flagged
Clinton	10/29 All samples	Zero concentration of propane, n-pentane	Entire sample flagged
	Many samples	Ethene>ethane, propene>propane, benzene>toluene	Probably real due to dense industry, no action taken
	10/8 1000, 9/18 0900	Ethylene=0	Entire sample flagged
	10/8 1000, 10/29 1100	Propylene=0	Entire sample flagged
	8/30 0700 All samples	Zero concentration of benzene, toluene, xylenes	Entire sample flagged

Table 1-3. Summary of data from the August-October 2001 operational period that failed screening criteria.

Site	Dates and Times	Comments	Action Performed
Deer Park	Many samples	Ethene>ethane, propene>propane, benzene>toluene	Probably real due to dense industry, no action taken
	10/22 0900	Zero concentration of ethane, ethylene, propane, propylene	Entire sample flagged
	8/8 1000, 8/12 1200, 8/16 1200, 8/18 1300, 8/20 1200, 9/19 1300	Propylene=0	Entire sample flagged
	8/2 1200	Zero concentration of xylenes	Entire sample flagged
HRM-3 Haden Rd.	Many samples	Ethene>ethane, propene>propane, benzene>toluene	Probably real due to dense industry, no action taken
	10/2 1100, 10/3 1000, 10/12 2100	C ₂ -C ₆ concentrations=0	Entire sample flagged
	9/24 1400-9/26 1800	Zero concentration of benzene, toluene, xylenes	Entire sample flagged
	10/3 1000, 10/23 1400	Ethane<2 ppbC and benzene>2 ppbC (possible problem with cold trap)	Entire sample flagged
HRM7 - Baytown	8/27, 8/29, 9/22 All samples	Zero concentration of benzene, toluene, xylenes	Entire sample flagged
	Many samples	Ethene>ethane, propene>propane, benzene>toluene	Probably real due to dense industry, no action taken

4. SUMMARY

Data quality for 2001 was good and, other than missing data, data analyses will not be limited or affected.

APPENDIX A

Appendix A contains detailed lists of August-October 2001 auto-GC samples that STI flagged as suspect. The tables for each site contain the date and time of the sample flagged, the QC flag changed, and our comments about the QC change. The QC codes of interest include 0=valid, 1=calibration, 7=suspect, and 8=invalid. Individual hydrocarbons (abbreviations are provided in the final table of the appendix) and/or the entire record for that date/time were flagged.

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Table A-1. List of samples flagged by STI for Channelview 2001. Species abbreviations are provided in Table A-6.

Date/Time	QC Change	Comment
9/25/01 21:00	3mpna QC code set to 7	0 Concentration
10/1/01 10:00	3mpna QC code set to 7	0 Concentration
10/6/01 14:00	3mpna QC code set to 7	0 Concentration
10/6/01 12:00	3mpna QC code set to 7	0 Concentration
10/6/01 16:00	3mpna QC code set to 7	0 Concentration
10/1/01 12:00	3mpna QC code set to 7	0 Concentration
10/6/01 13:00	3mpna QC code set to 7	0 Concentration
10/14/01 13:00	3mpna QC code set to 7	0 Concentration
10/6/01 1:00	3mpna QC code set to 7	0 Concentration
10/6/01 22:00	3mpna QC code set to 7	0 Concentration
10/5/01 23:00	3mpna QC code set to 7	0 Concentration
10/6/01 17:00	3mpna QC code set to 7	0 Concentration
10/6/01 15:00	3mpna QC code set to 7	0 Concentration
10/9/01 13:00	3mpna QC code set to 7	0 Concentration
10/6/01 0:00	3mpna QC code set to 7	0 Concentration
10/8/01 16:00	3mpna QC code set to 7	0 Concentration
10/6/01 19:00	3mpna QC code set to 7	0 Concentration
10/6/01 8:00	3mpna QC code set to 7	0 Concentration
10/13/01 19:00	3mpna QC code set to 7	0 Concentration
10/8/01 15:00	3mpna QC code set to 7	0 Concentration
10/8/01 12:00	3mpna QC code set to 7	0 Concentration
10/5/01 21:00	3mpna QC code set to 7	0 Concentration
10/7/01 4:00	3mpna QC code set to 7	0 Concentration
10/7/01 10:00	3mpna QC code set to 7	0 Concentration
10/7/01 3:00	3mpna QC code set to 7	0 Concentration
10/10/01 14:00	3mpna QC code set to 7	0 Concentration
10/9/01 12:00	3mpna QC code set to 7	0 Concentration
10/10/01 15:00	3mpna QC code set to 7	0 Concentration
10/6/01 10:00	3mpna QC code set to 7	0 Concentration
10/5/01 14:00	3mpna QC code set to 7	0 Concentration
10/7/01 11:00	3mpna QC code set to 7	0 Concentration
10/6/01 4:00	3mpna QC code set to 7	0 Concentration
10/10/01 13:00	3mpna QC code set to 7	0 Concentration
10/6/01 21:00	3mpna QC code set to 7	0 Concentration
10/10/01 5:00	3mpna QC code set to 7	0 Concentration
10/8/01 14:00	3mpna QC code set to 7	0 Concentration
10/9/01 14:00	3mpna QC code set to 7	0 Concentration
10/5/01 22:00	3mpna QC code set to 7	0 Concentration
10/14/01 16:00	3mpna QC code set to 7	0 Concentration
10/11/01 23:00	3mpna QC code set to 7	0 Concentration
10/13/01 15:00	3mpna QC code set to 7	0 Concentration

Table A-1. List of samples flagged by STI for Channelview 2001. Species abbreviations are provided in Table A-6.

Date/Time	QC Change	Comment
10/7/01 7:00	3mpna QC code set to 7	0 Concentration
10/11/01 4:00	3mpna QC code set to 7	0 Concentration
10/10/01 18:00	3mpna QC code set to 7	0 Concentration
10/9/01 11:00	3mpna QC code set to 7	0 Concentration
10/10/01 16:00	3mpna QC code set to 7	0 Concentration
10/9/01 15:00	3mpna QC code set to 7	0 Concentration
10/8/01 20:00	3mpna QC code set to 7	0 Concentration
10/6/01 7:00	3mpna QC code set to 7	0 Concentration
10/8/01 11:00	3mpna QC code set to 7	0 Concentration
10/9/01 10:00	3mpna QC code set to 7	0 Concentration
10/6/01 5:00	3mpna QC code set to 7	0 Concentration
10/6/01 6:00	3mpna QC code set to 7	0 Concentration
10/9/01 23:00	3mpna QC code set to 7	0 Concentration
10/14/01 10:00	3mpna QC code set to 7	0 Concentration
10/7/01 8:00	3mpna QC code set to 7	0 Concentration
10/5/01 11:00	3mpna QC code set to 7	0 Concentration
10/11/01 15:00	3mpna QC code set to 7	0 Concentration
10/11/01 15:00	3mpna QC code set to 7	0 Concentration
10/14/01 9:00	3mpna QC code set to 7	0 Concentration
10/8/01 21:00	3mpna QC code set to 7	0 Concentration
10/10/01 7:00	3mpna QC code set to 7	0 Concentration
10/9/01 22:00	3mpna QC code set to 7	0 Concentration
10/8/01 23:00	3mpna QC code set to 7	0 Concentration
10/10/01 9:00	3mpna QC code set to 7	0 Concentration
10/9/01 19:00	3mpna QC code set to 7	0 Concentration
10/10/01 23:00	3mpna QC code set to 7	0 Concentration
10/11/01 17:00	3mpna QC code set to 7	0 Concentration
10/11/01 8:00	3mpna QC code set to 7	0 Concentration
10/14/01 2:00	3mpna QC code set to 7	0 Concentration
10/9/01 16:00	3mpna QC code set to 7	0 Concentration
10/8/01 22:00	3mpna QC code set to 7	0 Concentration
10/11/01 2:00	3mpna QC code set to 7	0 Concentration
10/10/01 19:00	3mpna QC code set to 7	0 Concentration
10/11/01 14:00	3mpna QC code set to 7	0 Concentration
10/11/01 13:00	3mpna QC code set to 7	0 Concentration
10/10/01 8:00	3mpna QC code set to 7	0 Concentration
10/9/01 18:00	3mpna QC code set to 7	0 Concentration
10/13/01 10:00	3mpna QC code set to 7	0 Concentration
10/10/01 4:00	3mpna QC code set to 7	0 Concentration
10/9/01 3:00	3mpna QC code set to 7	0 Concentration

Table A-1. List of samples flagged by STI for Channelview 2001. Species abbreviations are provided in Table A-6.

Date/Time	QC Change	Comment
10/10/01 11:00	3mpna QC code set to 7	0 Concentration
10/10/01 10:00	3mpna QC code set to 7	0 Concentration
10/13/01 20:00	3mpna QC code set to 7	0 Concentration
10/9/01 20:00	3mpna QC code set to 7	0 Concentration
10/10/01 0:00	3mpna QC code set to 7	0 Concentration
10/11/01 16:00	3mpna QC code set to 7	0 Concentration
10/5/01 19:00	3mpna QC code set to 7	0 Concentration
10/11/01 5:00	3mpna QC code set to 7	0 Concentration
10/9/01 5:00	3mpna QC code set to 7	0 Concentration
10/9/01 2:00	3mpna QC code set to 7	0 Concentration
10/13/01 21:00	3mpna QC code set to 7	0 Concentration
10/5/01 17:00	3mpna QC code set to 7	0 Concentration
10/10/01 1:00	3mpna QC code set to 7	0 Concentration
10/11/01 19:00	3mpna QC code set to 7	0 Concentration
10/13/01 23:00	3mpna QC code set to 7	0 Concentration
10/16/2001 20:00:00	224tmp QC code set to 7	unusually high concentration
9/5/01 5:00	npnta QC code set to 7	unusually high concentration
10/2/01 14:00	m/pxy QC code set to 7	0 Concentration
10/2/01 14:00	tolu QC code set to 7	0 Concentration
10/1/01 10:00	m/pxy QC code set to 7	0 Concentration
10/2/01 14:00	234tmp QC code set to 7	0 Concentration
10/2/01 14:00	tolu QC code set to 7	0 Concentration
10/1/01 11:00	234tmp QC code set to 7	0 Concentration
10/1/01 10:00	234tmp QC code set to 7	0 Concentration
9/10/01 0:00	234tmp QC code set to 7	0 Concentration
9/10/01 1:00	234tmp QC code set to 7	0 Concentration
10/2/01 5:00	234tmp QC code set to 7	0 Concentration
10/2/01 23:00	234tmp QC code set to 7	0 Concentration
10/2/01 22:00	234tmp QC code set to 7	0 Concentration
9/10/01 23:00	234tmp QC code set to 7	0 Concentration
8/29/01 21:00	234tmp QC code set to 7	0 Concentration

Table A-2. List of samples flagged by STI for Clinton 2001. Species abbreviations are provided in Table A-6.

Date/Time	QC Change	Comment
8/29/01 19:00	benz QC code set to 7	unusually high concentration
10/8/01 10:00	ebenz QC code set to 7	0 concentration with high 124tmb
9/18/01 9:00	ebenz QC code set to 7	0 concentration with high 124tmb
8/4/01 2:00	ebenz QC code set to 7	0 concentration with high 124tmb
8/4/01 2:00	ethyl QC code set to 7	0 concentration
10/8/01 10:00	ethyl QC code set to 7	0 concentration
9/18/01 9:00	ethyl QC code set to 7	0 concentration
10/29/01 11:00	propa QC code set to 7	0 concentration
10/29/01 11:00	prpyl QC code set to 7	0 concentration
10/8/01 10:00	prpyl QC code set to 7	0 concentration
10/10/01 23:00	2mpna QC code set to 7	0 concentration
8/4/01 2:00	3mpna QC code set to 7	0 concentration
10/8/01 10:00	2mpna QC code set to 7	0 concentration
10/8/01 10:00	3mpna QC code set to 7	0 concentration
9/18/01 9:00	3mpna QC code set to 7	0 concentration
10/23/01 15:00	3mpna QC code set to 7	0 concentration
10/16/01 10:00	234tmp QC code set to 7	0 concentration
10/24/01 12:00	234tmp QC code set to 7	0 concentration
9/11/01 13:00	m/pxy QC code set to 7	0 Concentration
9/11/01 13:00	oxyl QC code set to 7	0 Concentration

Table A-3. List of samples flagged by STI for Deerpark 2001. Species abbreviations are provided in Table A-6.

Date/Time	QC Change	Comment
10/25/01 4:00	npnta QC code set to 7	suspiciously high, calibration carryover?
10/22/01 9:00	cyhxa QC code set to 7	suspiciously high: first data after 5 days
10/22/01 9:00	23dmp QC code set to 7	suspiciously high: first data after 5 days
10/22/01 9:00	3mhxa QC code set to 7	suspiciously high: first data after 5 days
10/22/01 9:00	nhept QC code set to 7	suspiciously high: first data after 5 days
10/22/01 9:00	ethyl QC code set to 7	0 concentration
10/22/01 9:00	ethan QC code set to 7	0 concentration
10/22/01 9:00	propa QC code set to 7	0 concentration
10/22/01 9:00	prpyl QC code set to 7	0 concentration
8/12/01 12:00	prpyl QC code set to 7	0 concentration
8/16/01 12:00	prpyl QC code set to 7	0 concentration
8/8/01 10:00	prpyl QC code set to 7	0 concentration
8/18/01 13:00	prpyl QC code set to 7	0 concentration
9/19/01 13:00	prpyl QC code set to 7	0 concentration
8/20/01 12:00	prpyl QC code set to 7	0 concentration
10/14/01 12:00	ispna QC code set to 7	0 concentration
10/25/01 4:00	npnta QC code set to 7	unusually high
10/15/01 3:00	2mpna QC code set to 7	0 concentration
10/14/01 12:00	2mpna QC code set to 7	0 concentration
10/14/01 12:00	3mpna QC code set to 7	0 concentration
8/10/01 12:00	3mpna QC code set to 7	0 concentration
10/23/01 12:00	3mpna QC code set to 7	0 concentration
10/22/01 14:00	3mpna QC code set to 7	0 concentration
10/22/01 9:00	3mpna QC code set to 7	0 concentration
10/23/01 0:00	3mpna QC code set to 7	0 concentration
10/22/01 19:00	3mpna QC code set to 7	0 concentration
10/22/01 11:00	3mpna QC code set to 7	0 concentration
10/22/01 20:00	3mpna QC code set to 7	0 concentration
10/22/01 12:00	3mpna QC code set to 7	0 concentration
10/22/01 22:00	3mpna QC code set to 7	0 concentration
10/22/01 21:00	3mpna QC code set to 7	0 concentration
10/22/01 18:00	3mpna QC code set to 7	0 concentration
10/23/01 8:00	3mpna QC code set to 7	0 concentration
10/23/01 7:00	3mpna QC code set to 7	0 concentration
10/23/01 6:00	3mpna QC code set to 7	0 concentration
10/15/01 3:00	2mpna QC code set to 7	0 concentration
10/2/01 5:00	2mpna QC code set to 7	0 concentration
8/2/01 12:00	m/pxy QC code set to 7	0 concentration
8/2/01 12:00	oxyl QC code set to 7	0 concentration

Table A-4. List of samples flagged by STI for HRM-3 2001. Species abbreviations are provided in Table A-6.

Date/Time	QC Change	Comment
10/30/01 20:00	2mpna QC code set to 7	0 concentration with high 3mpna
10/2/01 11:00	ethan QC code set to 7	0 concentration
10/22/01 9:00	ethan QC code set to 7	0 concentration
10/12/01 21:00	ethan QC code set to 7	0 concentration
10/3/01 5:00	propa QC code set to 7	0 concentration
10/3/01 5:00	prpyl QC code set to 7	0 concentration
10/3/01 5:00	isbta QC code set to 7	0 concentration
10/3/01 5:00	nbuta QC code set to 7	0 concentration
10/17/01 21:00	nbuta QC code set to 7	0 concentration
10/23/01 10:00	3mpna QC code set to 7	0 concentration
10/23/01 9:00	3mpna QC code set to 7	0 concentration
10/17/01 20:00	3mpna QC code set to 7	0 concentration
9/17/01 14:00	3mpna QC code set to 7	0 concentration
10/20/01 14:00	3mpna QC code set to 7	0 concentration
10/21/01 20:00	3mpna QC code set to 7	0 concentration
10/20/01 23:00	3mpna QC code set to 7	0 concentration
10/20/01 17:00	3mpna QC code set to 7	0 concentration
10/20/01 17:00	3mpna QC code set to 7	0 concentration
10/3/01 11:00	3mpna QC code set to 7	0 concentration
10/21/01 13:00	3mpna QC code set to 7	0 concentration
10/3/01 11:00	3mpna QC code set to 7	0 concentration
10/21/01 12:00	3mpna QC code set to 7	0 concentration
10/20/01 15:00	3mpna QC code set to 7	0 concentration
10/20/01 16:00	3mpna QC code set to 7	0 concentration
10/20/01 16:00	3mpna QC code set to 7	0 concentration
10/20/01 16:00	3mpna QC code set to 7	0 concentration
9/4/01 11:00	3mpna QC code set to 7	0 concentration
10/19/01 17:00	2mpna QC code set to 7	0 concentration
10/3/01 5:00	tolu QC code set to 7	0 concentration
10/3/01 5:00	benz QC code set to 7	0 concentration
9/4/01 11:00	benz QC code set to 7	0 concentration
10/30/01 6:00	m/pxy QC code set to 7	0 concentration
10/31/01 2:00	m/pxy QC code set to 7	0 concentration
10/30/01 0:00	m/pxy QC code set to 7	0 concentration
10/30/01 7:00	m/pxy QC code set to 7	0 concentration
10/30/01 4:00	m/pxy QC code set to 7	0 concentration
10/30/01 21:00	m/pxy QC code set to 7	0 concentration
10/30/01 23:00	m/pxy QC code set to 7	0 concentration
10/31/01 19:00	m/pxy QC code set to 7	0 concentration

Table A-4. List of samples flagged by STI for HRM-3 2001. Species abbreviations are provided in Table A-6.

Page 2 of 2

Date/Time	QC Change	Comment
10/30/01 17:00	m/pxy QC code set to 7	0 concentration
10/4/01 17:00	m/pxy QC code set to 7	0 concentration
10/30/01 8:00	m/pxy QC code set to 7	0 concentration
10/31/01 12:00	m/pxy QC code set to 7	0 concentration
10/30/01 19:00	m/pxy QC code set to 7	0 concentration
10/30/01 19:00	m/pxy QC code set to 7	0 concentration
10/30/01 19:00	m/pxy QC code set to 7	0 concentration
10/30/01 11:00	m/pxy QC code set to 7	0 concentration

Table A-5. List of samples flagged by STI for HRM-7 2001. Species abbreviations are provided in Table A-6.

Date/Time	QC Change	Comment
10/17/01 20:00	ispna QC code set to 7	0 Concentration
10/29/01 18:00	ispna QC code set to 7	0 Concentration
10/30/01 17:00	ispna QC code set to 7	0 Concentration
10/17/01 19:00	ispna QC code set to 7	0 Concentration
10/30/01 16:00	ispna QC code set to 7	0 Concentration
10/28/01 16:00	ispna QC code set to 7	0 Concentration
10/23/01 7:00	ispna QC code set to 7	0 Concentration
10/23/01 6:00	ispna QC code set to 7	0 Concentration
10/23/01 19:00	ispna QC code set to 7	0 Concentration
8/27/01 12:00	ispna QC code set to 7	0 Concentration
10/9/01 0:00	oxyl QC code set to 7	0 concentration
10/9/01 20:00	oxyl QC code set to 7	0 concentration
10/9/01 1:00	oxyl QC code set to 7	0 concentration
10/8/01 22:00	oxyl QC code set to 7	0 concentration
10/10/01 3:00	oxyl QC code set to 7	0 concentration
10/13/01 4:00	oxyl QC code set to 7	0 concentration
10/12/01 2:00	oxyl QC code set to 7	0 concentration
10/10/01 2:00	oxyl QC code set to 7	0 concentration
10/12/01 3:00	oxyl QC code set to 7	0 concentration
8/31/01 11:00	123tmb QC code set to 7	0 concentration
10/28/01 15:00	123tmb QC code set to 7	0 concentration
10/9/01 20:00	123tmb QC code set to 7	0 concentration
10/23/01 11:00	123tmb QC code set to 7	0 concentration
9/20/01 13:00	123tmb QC code set to 7	0 concentration
9/26/01 13:00	123tmb QC code set to 7	0 concentration
9/26/01 14:00	123tmb QC code set to 7	0 concentration
9/26/01 11:00	123tmb QC code set to 7	0 concentration
9/25/01 9:00	123tmb QC code set to 7	0 concentration
10/12/01 19:00	123tmb QC code set to 7	0 concentration
9/29/01 13:00	123tmb QC code set to 7	0 concentration
9/25/01 9:00	123tmb QC code set to 7	0 concentration
9/25/01 9:00	123tmb QC code set to 7	0 concentration
9/20/01 15:00	123tmb QC code set to 7	0 concentration
10/17/01 16:00	123tmb QC code set to 7	0 concentration
9/20/01 11:00	123tmb QC code set to 7	0 concentration
10/13/01 8:00	123tmb QC code set to 7	0 concentration
10/6/01 14:00	123tmb QC code set to 7	0 concentration
10/30/01 12:00	123tmb QC code set to 7	0 concentration
10/9/01 12:00	123tmb QC code set to 7	0 concentration
10/30/01 14:00	123tmb QC code set to 7	0 concentration

Table A-5. List of samples flagged by STI for HRM-7 2001. Species abbreviations are provided in Table A-6.

Page 2 of 2

Date/Time	QC Change	Comment
10/10/01 5:00	123tmb QC code set to 7	0 concentration
10/24/01 17:00	123tmb QC code set to 7	0 concentration
10/13/01 6:00	123tmb QC code set to 7	0 concentration
10/10/01 3:00	123tmb QC code set to 7	0 concentration
10/10/01 2:00	123tmb QC code set to 7	0 concentration
10/9/01 4:00	123tmb QC code set to 7	0 concentration
10/13/01 4:00	123tmb QC code set to 7	0 concentration
8/31/01 11:00	124tmb QC code set to 7	0 concentration

Table A-6. AIRS code, abbreviation, hydrocarbon name, and species group (O=olefin, P=paraffin, A=aromatic).

AIRS code	Abbreviation	Hydrocarbon	Species Group
43206	acety	Acetylene	O
43203	ethyl	Ethylene	O
43202	ethan	Ethane	P
43205	prpyl	Propylene	O
43204	propa	Propane	P
43214	isbta	Isobutane	P
43280	1bute	1-Butene	O
43212	nbuta	n-Butane	P
43216	t2bte	trans-2-Butene	O
43217	c2bte	cis-2-Butene	O
43282	3mlbe	3-Methyl-1-Butene	O
43221	ispna	Isopentane	P
43224	1pnte	1-Pentene	O
43220	npnta	n-Pentane	P
43243	ispre	Isoprene	O
43226	t2pne	trans-2-Pentene	O
43227	c2pne	cis-2-Pentene	O
43228	2m2be	2-Methyl-2-Butene	O
43244	22dmb	2,2-Dimethylbutane	P
43283	cypne	Cyclopentene	O
43234	4mlpe	4-Methyl-1-Pentene	O
43242	cypna	Cyclopentane	P
43284	23dmb	2,3-Dimethylbutane	P
43285	2mpna	2-Methylpentane	P
43230	3mpna	3-Methylpentane	P
43246	2m1pe	2-Methyl-1-Pentene	O
43231	nhexa	n-Hexane	P
43289	t2hex	trans-2-Hexene	O
43290	c2hex	cis-2-Hexene	O
43262	mcpna	Methylcyclopentane	P
43247	24dmp	2,4-Dimethylpentane	P
45201	benz	Benzene	A
43248	cyhxa	Cyclohexane	P
43263	2mhxa	2-Methylhexane	P
43291	23dmp	2,3-Dimethylpentane	P
43249	3mhxa	3-Methylhexane	P
43250	224tmp	2,2,4-Trimethylpentane	P
43232	nhept	n-Heptane	P
43261	mcyhx	Methylcyclohexane	P
43252	234tmp	2,3,4-Trimethylpentane	P
45202	tolu	Toluene	A

Table A-6. AIRS code, abbreviation, hydrocarbon name, and species group (O=olefin, P=paraffin, A=aromatic).

AIRS code	Abbreviation	Hydrocarbon	Species Group
43960	2mhpe	2-Methylheptane	P
43253	3mhpe	3-Methylheptane	P
43233	noct	n-Octane	P
45203	ebenz	Ethylbenzene	A
45109	m/pxy	m/p-Xylene	A
45205	mxyl	m-Xylene	A
45206	pxyl	p-Xylene	A
45220	styr	Styrene	A
45204	oxyl	o-Xylene	A
43235	nnon	n-Nonane	P
45210	ispbz	Isopropylbenzene	A
45209	npbz	n-Propylbenzene	A
43256	apine	alpha-Pinene	O
45207	135tmb	1,3,5-Trimethylbenzene	A
45208	124tmb	1,2,4-Trimethylbenzene	A
43257	bpine	beta-Pinene	O
45211	oetol	o-Ethyltoluene	A
45212	metol	m-Ethyltoluene	A
45213	petol	p-Ethyltoluene	A
45218	mdeben	m-diethylbenzene	A
45219	pdeben	p-diethylbenzene	A
45225	123tmb	1,2,3-trimethylbenzene	A
43238	ndec	n-Decane	P
43954	nundc	n-Undecane	P
43102	tnmoc	Total Non-Methane Organic Compounds	
43502	form	Formaldehyde	C
43503	aceta	Acetaldehyde	C
43551	acet	Acetone	C
43218	13buta	1,3-butadiene	O
43225	2m1bte	2-methyl-1-butene	O
43295	3ethex	3-ethylhexane	P
43955	25mhex	2,5-dimethylhexane	P
43293	hex24m	2,4-dimethylhexane	P
43294	hex23m	2,3-dimethylhexane	P
43222	propa22m	2,2-dimethylpropane	P
43270	ibute	Isobutene	O
43240	mcpne	Methylcyclopentene	O
43395	4mhpte	4-Methylheptane	P
43000	pamshc	Sum PAMS Target Species	