



## **QUALITY ASSURANCE AUDIT REPORT**

### **North Texas Commission Ambient Air and Meteorological Monitoring**

**Prepared for:**

**North Texas Commission  
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**Conducted:**

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## EXECUTIVE SUMMARY

On June 23 through 26, 2014, the Ambient Air Quality Assurance team of URS Corporation (URS) conducted performance and technical system audits of the North Texas Commission (NTC) ambient air monitoring network, providing an independent assessment of the monitoring program.

The monitoring program at NTC consists of continuous gas chromatographs (GC), volatile organic compound (VOC) canister collection systems, and meteorological sensors including wind speed, wind direction, temperature, and barometric pressure.

The performance audit results indicate acceptable responses for measurement systems and monitoring equipment with the following exceptions:

The wind direction alignment at the UTA Campus, Godley, Benbrook, Rushing, Mansfield, Bowie, and Wichita Falls sites was found to be outside of the audit objective of  $\pm 2^\circ$ . Initial wind direction alignment readings were taken to determine a correction factor for previously collected data. These sensors were then realigned and found to be within the audit objective. Following realignment, there is no further field action required.

Eight of the compounds (ethylene, propylene, acetylene, styrene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, 1,2,3-trimethylbenzene, and n-undecane) out of the 48 compounds being analyzed were found to be slightly outside the audit objective of  $\pm 30\%$  at several sites. These audit results are comparable historically to other URS auto-GC audits and indicate that there is not a significant issue with these eight compounds.

The unprocessed boiling point column recoveries at the Everman site missed their elution windows by a small margin. The CVS run following the audit also noted this issue. The site operator optimized the method and reprocessed the data, correcting the issue.

Technical systems audit results demonstrate satisfactory operational procedures for collecting valid data.

Below are the audit standard results for all network GCs:

Compound Name	Audit Conc (ppbc)	Dish Airfield		Eagle Mountain		Decatur		Godley	
		GC Response ppbc	% Rec	GC Response ppbc	% Rec	GC Response ppbc	% Rec	GC Response ppbc	% Rec
Ethane	10.60	9.12	86.05%	9.76	92.08%	9.60	90.58%	9.74	91.85%
Ethylene	10.60	7.89	74.42%	8.25	77.87%	8.47	79.88%	8.23	77.60%
Propane	15.30	14.50	94.74%	15.22	99.45%	14.99	97.96%	14.55	95.12%
Propylene	15.30	10.58	69.14%	11.80	77.15%	11.58	75.70%	10.74	70.18%
Iso-Butane	20.00	20.39	101.94%	22.19	110.97%	20.82	104.11%	19.34	96.72%
N-Butane	19.60	20.65	105.35%	22.27	113.63%	21.18	108.04%	19.72	100.59%
Acetylene	10.60	7.86	74.17%	8.37	78.96%	8.25	77.86%	7.87	74.25%
Trans-2-Butene	19.60	20.39	104.03%	21.79	111.18%	20.78	106.01%	18.90	96.41%
1-Butene	19.60	20.31	103.64%	22.18	113.14%	20.79	106.08%	19.52	99.61%
Cis-2-Butene	21.20	21.72	102.46%	22.92	108.12%	21.94	103.50%	20.61	97.24%
Cyclopentane	25.50	25.85	101.37%	29.58	116.00%	26.28	103.05%	24.68	96.79%
Iso-Pentane	26.50	27.46	103.63%	29.28	110.48%	27.80	104.91%	25.69	96.93%
N-Pentane	25.50	26.48	103.85%	30.01	117.70%	26.99	105.85%	25.09	98.38%
1,3-Butadiene	21.20	20.16	95.08%	23.29	109.88%	20.71	97.67%	18.95	89.41%
Trans-2-Pentene	26.00	25.42	97.75%	29.15	112.11%	26.38	101.45%	23.43	90.11%
1-Pentene	25.50	23.63	92.67%	27.91	109.45%	26.01	102.00%	22.19	87.01%
Cis-2-Pentene	27.50	25.61	93.13%	29.77	108.27%	27.72	100.81%	22.27	81.00%
2,2-Dimethylbutane	31.20	30.26	96.98%	34.71	111.26%	32.53	104.25%	29.21	93.63%
2-Methylpentane	30.00	30.45	101.50%	34.17	113.91%	31.81	106.03%	27.81	92.69%
Isoprene	26.00	21.25	81.75%	24.69	94.96%	24.25	93.28%	19.68	75.70%
n-Hexane	31.20	29.82	95.57%	28.87	92.54%	30.53	97.86%	31.97	102.46%
Methylcyclopentane	31.20	26.63	85.34%	28.57	91.58%	28.68	91.94%	28.10	90.06%
2,4-Dimethylpentane	36.40	36.99	101.61%	41.96	115.28%	37.00	101.64%	41.12	112.97%
Benzene	30.60	27.99	91.47%	27.01	88.27%	28.98	94.70%	29.86	97.57%
Cyclohexane	31.20	28.32	90.77%	30.60	98.07%	30.23	96.89%	30.15	96.63%
2-Methylhexane	31.80	28.34	89.11%	30.74	96.68%	31.51	99.07%	30.30	95.27%
2,3-Dimethylpentane	36.40	37.55	103.15%	41.94	115.22%	38.71	106.35%	42.53	116.85%
3-Methylhexane	36.40	32.50	89.28%	37.06	101.82%	34.74	95.45%	37.04	101.75%
2,2,4-Trimethylpentane	41.60	37.64	90.49%	41.16	98.94%	40.12	96.44%	41.07	98.72%
n-Heptane	36.40	32.72	89.88%	35.48	97.48%	34.15	93.81%	36.18	99.40%
Methylcyclohexane	36.40	33.26	91.38%	36.41	100.04%	33.12	90.98%	36.56	100.45%
2,3,4-Trimethylpentane	40.80	35.80	87.73%	38.90	95.35%	37.28	91.38%	39.60	97.06%
Toluene	35.70	31.44	88.05%	34.62	96.97%	31.56	88.42%	34.32	96.14%
2-Methylheptane	40.80	35.76	87.64%	39.82	97.60%	37.62	92.21%	40.06	98.19%
3-Methylheptane	40.80	36.47	89.39%	40.56	99.42%	38.61	94.63%	40.72	99.80%
n-Octane	40.80	36.04	88.33%	38.46	94.27%	38.26	93.77%	40.56	99.41%
Ethylbenzene	40.80	33.33	81.69%	35.14	86.12%	35.18	86.22%	36.91	90.47%
M&P-Xylene	81.60	64.84	79.46%	68.19	83.57%	68.90	84.44%	72.84	89.27%
Styrene	41.60	28.87	69.41%	31.25	75.13%	30.53	73.38%	31.92	76.74%
O-Xylene	40.00	33.69	84.21%	36.14	90.36%	36.21	90.52%	37.96	94.91%
N-Nonane	44.10	37.42	84.85%	41.09	93.18%	39.41	89.37%	42.55	96.49%
Isopropylbenzene	43.20	37.13	85.94%	39.59	91.64%	39.39	91.18%	41.56	96.21%
n-Propylbenzene	43.20	35.25	81.61%	37.77	87.43%	37.54	86.89%	38.98	90.23%
1,3,5-Trimethylbenzene	44.10	35.14	79.67%	40.04	90.80%	36.73	83.28%	39.76	90.16%
1,2,4-Trimethylbenzene	44.10	34.03	77.17%	36.21	82.10%	34.61	78.49%	36.95	83.78%
n-Decane	50.00	38.47	76.94%	41.63	83.26%	38.51	77.03%	42.89	85.77%
1,2,3-Trimethylbenzene	43.20	31.60	73.16%	33.25	76.97%	31.68	73.32%	34.63	80.16%
n-Undecane	52.80	38.66	73.22%	40.32	76.37%	34.37	65.10%	36.22	68.59%

Compound Name	Audit Conc (ppbc)	Benbrook		Everman		Elm Fork		Flower Mound	
		GC Response ppbc	% Rec	GC Response ppbc	% Rec	GC Response ppbc	% Rec	GC Response ppbc	% Rec
Ethane	10.60	9.63	90.88%	9.49	89.55%	8.45	79.67%	9.51	89.71%
Ethylene	10.60	6.29	<b>59.35%</b>	7.51	70.86%	6.54	<b>61.67%</b>	8.26	77.95%
Propane	15.30	15.66	102.33%	14.48	94.62%	15.80	103.27%	14.67	95.87%
Propylene	15.30	11.41	74.55%	10.50	<b>68.61%</b>	11.91	77.82%	11.53	75.34%
Iso-Butane	20.00	22.14	110.72%	20.26	101.32%	20.96	104.81%	20.13	100.63%
N-Butane	19.60	22.36	114.10%	20.60	105.09%	20.97	106.99%	20.59	105.05%
Acetylene	10.60	8.46	79.77%	7.50	70.80%	9.66	91.18%	8.00	75.51%
Trans-2-Butene	19.60	21.77	111.09%	20.33	103.71%	20.64	105.30%	20.27	103.43%
1-Butene	19.60	21.85	111.47%	20.58	104.98%	20.66	105.43%	20.26	103.36%
Cis-2-Butene	21.20	22.51	106.19%	21.50	101.42%	21.91	103.34%	21.28	100.37%
Cyclopentane	25.50	27.94	109.55%	26.19	102.70%	26.30	103.15%	25.77	101.04%
Iso-Pentane	26.50	29.03	109.55%	27.36	103.24%	27.47	103.66%	27.13	102.36%
N-Pentane	25.50	28.39	111.32%	26.76	104.96%	26.86	105.33%	26.31	103.16%
1,3-Butadiene	21.20	21.25	100.23%	20.55	96.95%	19.94	94.03%	20.31	95.82%
Trans-2-Pentene	26.00	26.52	101.98%	25.75	99.04%	25.89	99.59%	25.76	99.06%
1-Pentene	25.50	24.50	96.08%	24.73	96.98%	24.32	95.37%	24.96	97.87%
Cis-2-Pentene	27.50	26.06	94.78%	26.17	95.15%	26.50	96.37%	26.62	96.79%
2,2-Dimethylbutane	31.20	33.63	107.77%	30.45	97.60%	31.52	101.03%	31.12	99.75%
2-Methylpentane	30.00	32.35	107.84%	30.93	103.10%	31.53	105.09%	29.39	97.98%
Isoprene	26.00	21.82	83.91%	21.50	82.69%	22.92	88.15%	22.76	87.54%
n-Hexane	31.20	31.82	101.99%	33.92	108.71%	32.26	103.39%	32.19	103.16%
Methylcyclopentane	31.20	30.77	98.62%	26.89	86.18%	31.33	100.41%	29.10	93.27%
2,4-Dimethylpentane	36.40	37.59	103.27%	37.36	102.65%	36.91	101.40%	37.11	101.94%
Benzene	30.60	30.63	100.09%	28.57	93.37%	30.48	99.62%	29.57	96.64%
Cyclohexane	31.20	30.81	98.76%	29.37	94.14%	30.88	98.99%	30.50	97.77%
2-Methylhexane	31.80	33.30	104.73%	29.49	92.73%	35.17	110.61%	32.86	103.34%
2,3-Dimethylpentane	36.40	39.32	108.01%	38.72	106.37%	37.88	104.06%	39.99	109.86%
3-Methylhexane	36.40	35.57	97.73%	33.31	91.52%	35.89	98.60%	36.67	100.74%
2,2,4-Trimethylpentane	41.60	40.25	96.76%	38.58	92.74%	40.57	97.52%	39.31	94.49%
n-Heptane	36.40	35.42	97.30%	33.61	92.34%	36.22	99.52%	35.30	96.97%
Methylcyclohexane	36.40	35.63	97.89%	34.01	93.42%	36.38	99.95%	35.77	98.28%
2,3,4-Trimethylpentane	40.80	38.52	94.40%	36.91	90.47%	40.36	98.93%	38.05	93.26%
Toluene	35.70	33.57	94.03%	32.29	90.45%	35.28	98.84%	33.00	92.44%
2-Methylheptane	40.80	38.28	93.81%	36.89	90.42%	40.39	99.00%	38.59	94.59%
3-Methylheptane	40.80	38.69	94.83%	37.46	91.81%	41.39	101.44%	38.92	95.40%
n-Octane	40.80	38.52	94.42%	36.89	90.40%	40.35	98.89%	38.57	94.52%
Ethylbenzene	40.80	34.90	85.53%	33.66	82.50%	38.68	94.80%	36.41	89.23%
M&P-Xylene	81.60	67.11	82.25%	65.86	80.72%	74.95	91.85%	72.71	89.10%
Styrene	41.60	29.11	<b>69.98%</b>	29.60	71.16%	32.87	79.01%	30.44	73.17%
O-Xylene	40.00	35.18	87.96%	34.38	85.95%	37.37	93.43%	36.90	92.24%
N-Nonane	44.10	39.56	89.71%	38.36	86.99%	41.73	94.63%	41.56	94.24%
Isopropylbenzene	43.20	37.63	87.11%	36.50	84.48%	41.60	96.30%	40.33	93.35%
n-Propylbenzene	43.20	35.19	81.46%	35.25	81.59%	39.23	90.81%	38.03	88.03%
1,3,5-Trimethylbenzene	44.10	32.61	73.95%	34.29	77.75%	35.90	81.40%	40.86	92.65%
1,2,4-Trimethylbenzene	44.10	32.49	73.66%	33.71	76.45%	35.81	81.20%	30.88	70.02%
n-Decane	50.00	37.79	75.57%	38.27	76.54%	40.59	81.19%	39.25	78.49%
1,2,3-Trimethylbenzene	43.20	29.43	<b>68.13%</b>	30.77	71.23%	32.44	75.09%	31.59	73.12%
n-Undecane	52.80	35.56	<b>67.36%</b>	35.60	<b>67.42%</b>	31.91	<b>60.44%</b>	35.29	<b>66.83%</b>

Compound Name	Audit Conc (ppbc)	UTA		Mansfield		Kennedale		Rhome		Rushing	
		GC Response ppbc	%Rec	GC Response ppbc	%Rec	GC Response ppbc	%Rec	GC Response ppbc	%Rec	GC Response ppbc	%Rec
Ethane	10.60	9.40	88.68%	9.20	86.83%	8.62	81.35%	9.46	89.21%	10.20	96.23%
Ethylene	10.60	7.30	<b>68.87%</b>	5.76	<b>54.37%</b>	7.24	<b>68.33%</b>	6.73	<b>63.47%</b>	7.80	73.58%
Propane	15.30	15.50	101.31%	14.79	96.64%	13.54	88.47%	15.33	100.22%	15.50	101.31%
Propylene	15.30	11.80	77.12%	11.46	74.90%	10.73	70.11%	11.25	73.55%	11.60	75.82%
Iso-Butane	20.00	23.50	117.50%	22.13	110.66%	19.67	98.37%	22.42	112.11%	20.20	101.00%
N-Butane	19.60	23.70	120.92%	22.58	115.21%	20.08	102.44%	22.79	116.27%	20.70	105.61%
Acetylene	10.60	7.60	71.70%	7.80	73.57%	7.40	<b>69.84%</b>	8.08	76.24%	5.50	<b>51.89%</b>
Trans-2-Butene	19.60	23.20	118.37%	21.90	111.73%	20.05	102.32%	22.19	113.21%	20.20	103.06%
1-Butene	19.60	23.10	117.86%	21.53	109.83%	19.59	99.96%	22.08	112.67%	19.70	100.51%
Cis-2-Butene	21.20	24.50	115.57%	23.07	108.82%	21.05	99.27%	23.47	110.70%	21.10	99.53%
Cyclopentane	25.50	29.50	115.69%	27.83	109.15%	24.82	97.32%	28.01	109.84%	26.00	101.96%
Iso-Pentane	26.50	31.20	117.74%	29.48	111.23%	26.04	98.26%	30.17	113.86%	26.60	100.38%
N-Pentane	25.50	30.00	117.65%	28.37	111.25%	25.21	98.87%	28.80	112.94%	26.40	103.53%
1,3-Butadiene	21.20	22.20	104.72%	21.48	101.31%	19.53	92.13%	21.41	100.97%	19.30	91.04%
Trans-2-Pentene	26.00	29.00	111.54%	27.06	104.06%	24.40	93.86%	27.65	106.35%	23.80	91.54%
1-Pentene	25.50	27.40	107.45%	25.98	101.90%	23.74	93.10%	26.11	102.38%	22.00	86.27%
Cis-2-Pentene	27.50	29.70	108.00%	28.01	101.86%	25.39	92.34%	28.15	102.38%	24.20	88.00%
2,2-Dimethylbutane	31.20	35.90	115.06%	32.82	105.21%	30.08	96.41%	33.12	106.14%	31.60	101.28%
2-Methylpentane	30.00	33.60	112.00%	32.68	108.92%	28.75	95.84%	33.65	112.17%	28.20	94.00%
Isoprene	26.00	24.90	95.77%	24.16	92.93%	21.44	82.47%	24.29	93.42%	21.10	81.15%
n-Hexane	31.20	32.20	103.21%	30.64	98.19%	27.30	87.48%	35.23	112.91%	32.50	104.17%
Methylcyclopentane	31.20	31.80	101.92%	30.67	98.31%	23.38	74.94%	30.76	98.59%	30.10	96.47%
2,4-Dimethylpentane	36.40	38.40	105.49%	37.00	101.66%	38.28	105.17%	38.32	105.27%	39.90	109.62%
Benzene	30.60	30.90	100.98%	29.01	94.80%	27.94	91.32%	29.84	97.50%	29.40	96.08%
Cyclohexane	31.20	32.40	103.85%	30.54	97.87%	29.37	94.15%	31.87	102.15%	31.70	101.60%
2-Methylhexane	31.80	34.70	109.12%	34.19	107.50%	26.23	82.47%	32.60	102.52%	32.00	100.63%
2,3-Dimethylpentane	36.40	40.40	110.99%	38.51	105.80%	39.05	107.28%	39.41	108.27%	41.60	114.29%
3-Methylhexane	36.40	37.20	102.20%	36.80	101.09%	35.03	96.24%	35.65	97.94%	37.30	102.47%
2,2,4-Trimethylpentane	41.60	41.30	99.28%	40.78	98.04%	37.90	91.10%	41.53	99.82%	41.80	100.48%
n-Heptane	36.40	36.30	99.73%	34.67	95.24%	32.79	90.07%	35.68	98.03%	34.80	95.60%
Methylcyclohexane	36.40	37.50	103.02%	34.94	95.99%	33.22	91.26%	35.75	98.21%	36.00	98.90%
2,3,4-Trimethylpentane	40.80	40.30	98.77%	38.59	94.58%	33.12	81.19%	38.64	94.70%	39.40	96.57%
Toluene	35.70	33.90	94.96%	33.65	94.25%	32.27	90.39%	31.78	89.01%	34.00	95.24%
2-Methylheptane	40.80	39.80	97.55%	38.30	93.87%	34.83	85.37%	38.11	93.40%	39.10	95.83%
3-Methylheptane	40.80	40.30	98.77%	38.70	94.84%	35.47	86.94%	38.77	95.02%	39.40	96.57%
n-Octane	40.80	39.60	97.06%	38.30	93.87%	34.41	84.33%	38.05	93.27%	39.50	96.81%
Ethylbenzene	40.80	36.60	89.71%	35.69	87.48%	31.25	76.60%	33.18	81.32%	34.90	85.54%
M&P-Xylene	81.60	70.30	86.15%	68.72	84.22%	60.95	74.69%	63.49	77.81%	68.40	83.82%
Styrene	41.60	31.90	76.68%	31.94	76.79%	26.38	<b>63.41%</b>	26.73	<b>64.26%</b>	32.90	79.09%
O-Xylene	40.00	36.50	91.25%	35.85	89.62%	33.65	84.12%	33.66	84.14%	37.20	93.00%
N-Nonane	44.10	40.70	92.29%	39.74	90.12%	37.04	84.00%	39.17	88.82%	42.10	95.46%
Isopropylbenzene	43.20	39.80	92.13%	39.46	91.35%	34.95	80.89%	37.08	85.82%	38.50	89.12%
n-Propylbenzene	43.20	37.60	87.04%	37.46	86.72%	32.07	74.24%	34.12	78.98%	36.60	84.72%
1,3,5-Trimethylbenzene	44.10	34.70	78.68%	36.30	82.31%	34.78	78.87%	30.22	<b>68.52%</b>	35.10	79.59%
1,2,4-Trimethylbenzene	44.10	34.50	78.23%	35.49	80.47%	29.66	<b>67.27%</b>	31.53	71.50%	36.80	83.45%
n-Decane	50.00	39.70	79.40%	40.91	81.81%	35.55	71.11%	38.94	77.88%	40.80	81.60%
1,2,3-Trimethylbenzene	43.20	31.40	72.69%	32.97	76.32%	26.24	<b>60.74%</b>	29.62	<b>68.56%</b>	32.40	75.00%
n-Undecane	52.80	35.30	<b>66.86%</b>	39.07	73.99%	31.98	<b>60.57%</b>	35.07	<b>66.43%</b>	37.40	70.83%