

**QUALITY ASSURANCE AUDIT REPORT
Executive Summary**

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

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EXECUTIVE SUMMARY

On June 8th through 11th, 2015, the Ambient Air Quality Assurance team of AECOM 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 was found to be outside of the audit objective of $\pm 2^\circ$ at three sites: Godley, Decatur, and Lancaster. These sensors were realigned and found to be within the audit objective. Following realignment, there is no further field action required.

Out of the 48 compounds being analyzed, six compounds (ethylene, propylene, acetylene, styrene, 1,2,3-trimethylbenzene, and n-undecane) were found to be outside of the audit objective of $\pm 30\%$ at several sites, while cis-2-pentene and isoprene were outside of audit parameters at only one site. These audit results are comparable historically to other AECOM auto-GC audits and indicate that there is not a significant issue.

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

At least once a quarter, a canister prepared by a quality assurance team member with known concentrations of selected VOCs is sent to the GD Air Testing Laboratory to evaluate the performance of their lab. Below are GD Air's most recent performance evaluation canister results analyzed on June 23, 2015.

Compound	Known Concentration (ppb-v)	Lab Results (ppb-v)	Percent Recovery
Propylene	8.7	9.0	103.2%
Freon-12 (Dichlorodifluoromethane)	4.2	4.3	101.0%
Chloromethane (Methyl Chloride)	4.3	4.2	97.9%
Vinyl Chloride	4.3	4.3	98.1%
1,3-Butadiene	8.5	8.7	101.9%
Bromomethane	4.2	4.1	99.4%
Chloroethane	4.2	4.6	109.3%
Freon-11 (Trichlorofluoromethane)	4.4	4.6	105.1%
1,1-Dichloroethene	4.3	4.0	93.0%
Methylene Chloride (Dichloromethane)	4.3	3.8	88.1%
1,1-Dichloroethane	4.3	3.9	89.9%
Hexane	12.7	13.1	103.1%
Chloroform	4.2	3.8	90.0%
1,2-Dichloroethane	4.4	3.6	81.6%
1,1,1-Trichloroethane	4.3	3.9	89.8%
Benzene	4.4	3.8	86.9%
Carbon tetrachloride	4.3	3.9	91.3%
Cyclohexane	4.3	3.2	74.5%
1,2-Dichloropropane	4.4	3.7	84.0%
Trichloroethylene	4.3	4.7	108.9%
Heptane	4.4	3.8	85.1%
c-1,3-Dichloropropene	4.6	4.4	95.1%
t-1,3-Dichloropropene	4.5	4.2	92.2%
1,1,2-Trichloroethane	4.4	3.5	79.0%
Toluene	4.5	3.5	79.2%
1,2-Dibromoethane	4.4	3.6	83.0%
Tetrachloroethylene	4.4	3.6	82.5%
Chlorobenzene	4.5	3.5	77.8%
Ethylbenzene	4.4	3.8	86.5%
p-Xylene & m-Xylene	8.6	7.5	87.4%
Styrene	4.4	3.9	89.6%
o-Xylene	4.4	3.6	80.4%
1,1,2,2-Tetrachloroethane	4.4	2.4	54.8%
4-Ethyltoluene (p-Ethyltoluene)	4.2	3.1	73.7%
1,3,5-Trimethylbenzene	4.3	3.5	81.6%
1,2,4-Trimethylbenzene	4.3	3.3	76.7%
Ethyl Bromide (Bromoethane)	4.3	4.1	95.5%
2,2,4-Trimethylpentane	4.3	3.8	87.6%
Ethylene	4.5	5.4	119.3%
Ethane	4.5	4.9	107.0%
Propane	4.2	2.1	49.2%
1-Butene	4.2	4.3	103.1%
Butane	4.2	4.2	99.8%
1-Pentene	4.2	5.2	124.3%
Pentane	4.2	4.9	116.6%
1-Hexene	4.0	3.0	74.5%

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	8.4	7.3	86.6%	7.4	88.1%	7.5	89.4%	7.2	86.2%
Ethylene	8.4	6.2	73.5%	6.6	78.9%	6.4	75.9%	6.1	73.1%
Propane	12.0	11.2	93.2%	11.3	94.4%	11.5	96.2%	11.2	93.3%
Propylene	12.3	8.4	68.6%	8.5	69.1%	9.1	73.8%	7.9	64.4%
Iso-Butane	16.0	15.7	98.3%	16.4	102.6%	16.6	103.9%	15.7	97.9%
N-Butane	16.0	15.9	99.6%	16.5	103.4%	16.9	105.9%	15.6	97.5%
Acetylene	8.4	5.8	69.5%	5.9	69.7%	6.3	74.8%	5.8	68.5%
Trans-2-Butene	16.0	15.7	98.4%	16.3	101.7%	16.7	104.6%	14.9	93.0%
1-Butene	16.0	15.8	99.0%	17.0	106.1%	16.7	104.6%	15.2	95.2%
Cis-2-Butene	17.2	16.6	96.4%	17.1	99.2%	17.5	102.0%	16.1	93.5%
Cyclopentane	20.5	20.0	97.3%	20.7	100.8%	21.1	102.8%	19.7	96.2%
Iso-Pentane	21.5	21.1	98.2%	21.9	101.9%	21.9	101.9%	20.7	96.2%
N-Pentane	20.5	20.4	99.5%	21.0	102.6%	21.4	104.4%	19.9	97.3%
1,3-Butadiene	16.8	16.1	96.0%	17.4	103.7%	17.3	102.8%	14.4	85.9%
Trans-2-Pentene	21.0	19.7	93.8%	21.3	101.6%	20.9	99.6%	16.7	79.3%
1-Pentene	20.5	19.0	92.7%	20.7	101.1%	20.7	101.2%	17.7	86.2%
Cis-2-Pentene	22.0	20.1	91.6%	22.1	100.6%	21.9	99.6%	13.7	62.1%
2,2-Dimethylbutane	25.2	22.5	89.4%	26.2	104.1%	25.4	100.9%	22.0	87.5%
2-Methylpentane	24.6	23.5	95.6%	25.3	102.7%	24.1	98.1%	20.8	84.4%
Isoprene	21.0	16.8	79.9%	17.9	85.2%	18.7	88.9%	13.8	65.5%
n-Hexane	25.2	25.1	99.5%	29.5	116.9%	23.6	93.7%	22.8	90.4%
Methylcyclopentane	25.2	21.2	84.1%	21.7	86.2%	21.5	85.2%	19.8	78.5%
2,4-Dimethylpentane	29.4	29.0	98.6%	29.4	99.9%	30.5	103.7%	30.5	103.7%
Benzene	25.2	22.3	88.6%	21.6	85.7%	22.2	87.9%	22.3	88.5%
Cyclohexane	25.2	22.7	90.3%	23.7	94.0%	23.0	91.2%	23.4	92.7%
2-Methylhexane	30.1	24.0	79.7%	23.7	78.8%	24.0	79.7%	21.3	70.9%
2,3-Dimethylpentane	30.1	30.1	99.8%	32.1	106.7%	30.3	100.5%	32.9	109.2%
3-Methylhexane	29.4	26.6	90.6%	27.9	94.9%	26.8	91.3%	27.5	93.5%
2,2,4-Trimethylpentane	33.6	29.9	88.9%	31.0	92.1%	30.6	90.9%	29.7	88.5%
n-Heptane	29.4	26.4	89.8%	26.8	91.3%	26.7	90.7%	26.3	89.6%
Methylcyclohexane	29.4	26.3	89.4%	27.4	93.3%	27.0	91.9%	26.4	89.9%
2,3,4-Trimethylpentane	32.8	29.4	89.8%	29.9	91.2%	29.4	89.6%	28.8	87.7%
Toluene	29.4	25.8	87.7%	25.0	85.1%	26.7	90.7%	25.2	85.7%
2-Methylheptane	33.6	29.6	88.1%	30.1	89.7%	29.4	87.5%	29.7	88.3%
3-Methylheptane	33.6	29.9	88.8%	29.7	88.5%	28.7	85.4%	29.9	88.9%
n-Octane	32.8	29.2	88.9%	29.8	91.0%	29.0	88.5%	29.3	89.5%
Ethylbenzene	33.6	27.8	82.9%	27.8	82.9%	27.3	81.2%	26.3	78.4%
M&P-Xylene	65.6	54.3	82.8%	54.4	83.0%	53.1	81.0%	52.0	79.3%
Styrene	32.8	24.3	74.0%	23.4	71.5%	24.3	74.0%	22.0	67.0%
O-Xylene	32.8	27.0	82.2%	29.0	88.3%	27.9	85.1%	27.3	83.1%
N-Nonane	36.0	31.3	86.9%	32.9	91.5%	31.2	86.6%	30.0	83.2%
Isopropylbenzene	36.0	31.1	86.4%	32.0	89.0%	30.2	84.0%	29.7	82.5%
n-Propylbenzene	35.1	29.7	84.7%	29.7	84.6%	29.0	82.6%	28.4	80.9%
1,3,5-Trimethylbenzene	36.0	28.9	80.2%	29.6	82.2%	29.5	81.9%	29.3	81.3%
1,2,4-Trimethylbenzene	36.0	28.6	79.5%	28.0	77.8%	27.5	76.4%	27.1	75.3%
n-Decane	41.0	32.0	78.1%	33.7	82.3%	29.5	72.0%	30.9	75.4%
1,2,3-Trimethylbenzene	35.1	26.6	75.7%	26.4	75.3%	23.9	68.0%	24.2	68.8%
n-Undecane	42.9	28.5	66.4%	30.0	69.9%	24.9	58.1%	25.4	59.3%

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	8.4	7.1	84.1%	7.7	91.5%	7.5	89.2%	7.4	87.7%
Ethylene	8.4	6.1	72.7%	6.0	71.9%	6.1	73.1%	6.3	74.9%
Propane	12.0	10.9	90.6%	11.7	97.8%	12.3	102.3%	11.1	92.7%
Propylene	12.3	9.0	73.5%	8.0	65.3%	9.0	73.0%	8.4	68.4%
Iso-Butane	16.0	15.4	96.4%	15.5	96.8%	16.6	103.8%	15.5	97.0%
N-Butane	16.0	15.5	97.1%	15.7	98.0%	17.1	106.7%	15.5	96.6%
Acetylene	8.4	4.0	47.4%	6.5	77.7%	7.5	88.8%	6.1	72.9%
Trans-2-Butene	16.0	15.3	95.9%	15.2	95.2%	16.7	104.4%	15.3	95.8%
1-Butene	16.0	15.3	95.7%	15.5	97.0%	16.6	103.7%	15.4	96.2%
Cis-2-Butene	17.2	16.4	95.3%	16.2	94.1%	17.7	103.1%	16.2	94.4%
Cyclopentane	20.5	19.7	96.1%	19.8	96.4%	21.4	104.5%	19.4	94.9%
Iso-Pentane	21.5	20.6	95.7%	21.1	98.2%	22.4	104.3%	20.6	95.7%
N-Pentane	20.5	20.1	97.8%	20.4	99.7%	21.7	105.8%	19.8	96.6%
1,3-Butadiene	16.8	15.3	91.3%	15.8	94.3%	15.2	90.5%	15.6	92.7%
Trans-2-Pentene	21.0	19.1	91.0%	20.0	95.3%	20.0	95.3%	19.1	90.9%
1-Pentene	20.5	17.6	86.1%	19.6	95.4%	18.1	88.5%	18.2	88.7%
Cis-2-Pentene	22.0	18.7	85.1%	20.4	93.0%	20.6	93.7%	19.0	86.2%
2,2-Dimethylbutane	25.2	23.8	94.6%	24.7	98.0%	24.7	98.1%	21.7	86.0%
2-Methylpentane	24.6	23.1	94.1%	24.5	99.6%	24.7	100.3%	22.0	89.4%
Isoprene	21.0	15.0	71.6%	15.8	75.4%	17.6	83.9%	15.1	72.1%
n-Hexane	25.2	22.9	91.0%	24.3	96.5%	25.6	101.8%	24.1	95.6%
Methylcyclopentane	25.2	19.7	78.0%	29.5	117.2%	25.2	100.2%	19.9	79.0%
2,4-Dimethylpentane	29.4	29.0	98.7%	23.2	79.0%	30.8	104.7%	30.3	103.1%
Benzene	25.2	21.8	86.5%	23.8	94.4%	24.6	97.5%	20.5	81.2%
Cyclohexane	25.2	22.5	89.4%	24.4	97.0%	26.0	103.0%	22.0	87.5%
2-Methylhexane	30.1	21.6	71.8%	25.8	85.8%	28.7	95.3%	22.6	75.1%
2,3-Dimethylpentane	30.1	30.8	102.5%	32.4	107.6%	32.6	108.3%	31.3	103.9%
3-Methylhexane	29.4	26.0	88.4%	28.4	96.4%	30.4	103.4%	27.1	92.3%
2,2,4-Trimethylpentane	33.6	28.7	85.4%	32.4	96.4%	34.3	102.2%	29.7	88.3%
n-Heptane	29.4	25.5	86.6%	28.4	96.5%	29.5	100.5%	26.2	88.9%
Methylcyclohexane	29.4	25.7	87.3%	28.4	96.6%	30.0	102.0%	26.1	88.9%
2,3,4-Trimethylpentane	32.8	27.6	84.2%	31.2	95.1%	32.3	98.4%	28.6	87.3%
Toluene	29.4	23.2	79.0%	26.4	89.9%	27.3	93.0%	24.3	82.7%
2-Methylheptane	33.6	27.9	83.0%	31.4	93.5%	32.9	97.8%	29.3	87.2%
3-Methylheptane	33.6	28.6	85.2%	31.9	94.9%	33.7	100.4%	27.8	82.8%
n-Octane	32.8	27.7	84.3%	30.9	94.2%	33.0	100.6%	29.5	89.9%
Ethylbenzene	33.6	26.0	77.3%	28.5	84.9%	30.6	91.0%	28.1	83.6%
M&P-Xylene	65.6	49.8	75.9%	55.5	84.6%	59.2	90.3%	57.7	87.9%
Styrene	32.8	21.6	65.8%	24.6	75.0%	26.7	81.3%	23.3	71.1%
O-Xylene	32.8	26.2	79.9%	29.0	88.4%	29.7	90.6%	29.2	89.0%
N-Nonane	36.0	29.1	80.8%	32.3	89.6%	34.0	94.5%	32.2	89.4%
Isopropylbenzene	36.0	28.9	80.2%	31.0	86.0%	32.4	90.1%	30.5	84.8%
n-Propylbenzene	35.1	26.9	76.7%	29.4	83.9%	31.4	89.4%	29.1	82.9%
1,3,5-Trimethylbenzene	36.0	25.6	71.2%	28.1	78.1%	28.7	79.8%	30.3	84.2%
1,2,4-Trimethylbenzene	36.0	26.6	73.9%	27.8	77.2%	29.3	81.3%	25.4	70.7%
n-Decane	41.0	30.6	74.6%	30.4	74.2%	33.4	81.4%	31.1	76.0%
1,2,3-Trimethylbenzene	35.1	23.9	68.2%	24.1	68.8%	26.3	74.9%	22.7	64.8%
n-Undecane	42.9	28.8	67.2%	25.3	59.0%	28.7	67.0%	25.7	59.9%

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	8.4	7.3	87.3%	7.1	85.0%	7.6	90.4%	7.1	84.1%	7.4	88.0%
Ethylene	8.4	5.6	66.8%	5.0	59.0%	5.9	69.8%	6.0	71.5%	4.3	51.0%
Propane	12.0	11.4	94.6%	10.8	90.1%	11.7	97.6%	12.9	107.6%	11.4	95.4%
Propylene	12.3	8.7	71.0%	7.1	58.1%	8.0	64.8%	8.8	71.9%	7.5	61.2%
Iso-Butane	16.0	17.2	107.3%	15.2	94.8%	16.0	100.1%	16.3	101.6%	16.2	101.3%
N-Butane	16.0	17.3	107.8%	15.4	96.1%	16.3	102.1%	16.2	101.4%	16.4	102.2%
Acetylene	8.4	6.7	80.3%	5.2	62.5%	5.8	68.7%	5.7	68.3%	4.9	58.9%
Trans-2-Butene	16.0	17.1	106.9%	14.9	93.4%	16.1	100.9%	16.2	101.3%	16.0	100.2%
1-Butene	16.0	17.1	106.7%	14.9	93.3%	16.1	100.7%	16.3	101.9%	15.8	98.4%
Cis-2-Butene	17.2	18.0	104.5%	15.8	91.9%	17.0	98.7%	17.1	99.6%	16.6	96.8%
Cyclopentane	20.5	21.7	105.7%	19.2	93.9%	20.5	99.8%	20.6	100.5%	20.4	99.3%
Iso-Pentane	21.5	22.7	105.5%	20.4	94.7%	21.6	100.3%	21.7	101.0%	21.4	99.7%
N-Pentane	20.5	21.8	106.4%	19.5	95.3%	21.0	102.3%	20.9	101.9%	21.0	102.5%
1,3-Butadiene	16.8	16.1	95.5%	15.5	92.3%	16.5	98.5%	16.2	96.5%	16.3	97.1%
Trans-2-Pentene	21.0	20.1	95.5%	19.0	90.6%	20.4	97.0%	19.8	94.4%	19.7	93.7%
1-Pentene	20.5	19.3	94.2%	18.6	90.9%	20.0	97.6%	18.5	90.4%	19.1	93.0%
Cis-2-Pentene	22.0	18.9	85.8%	20.0	90.8%	21.2	96.4%	20.5	93.4%	20.1	91.5%
2,2-Dimethylbutane	25.2	24.7	98.2%	23.8	94.5%	25.2	99.9%	24.0	95.3%	24.8	98.5%
2-Methylpentane	24.6	25.2	102.3%	23.3	94.8%	24.0	97.7%	23.5	95.5%	24.1	98.2%
Isoprene	21.0	15.9	75.6%	16.9	80.6%	18.1	86.3%	16.9	80.4%	15.9	75.9%
n-Hexane	25.2	23.9	94.9%	23.2	92.0%	23.9	94.9%	23.8	94.4%	24.9	98.7%
Methylcyclopentane	25.2	22.1	87.7%	21.4	84.8%	20.2	80.0%	22.1	87.8%	22.4	89.0%
2,4-Dimethylpentane	29.4	30.2	102.8%	29.8	101.3%	32.8	111.4%	32.7	111.1%	30.3	103.1%
Benzene	25.2	24.3	96.5%	22.1	87.7%	22.6	89.7%	22.0	87.4%	22.0	87.2%
Cyclohexane	25.2	24.2	96.2%	22.9	90.9%	24.3	96.5%	25.4	101.0%	24.6	97.7%
2-Methylhexane	30.1	24.7	81.9%	24.4	80.9%	22.1	73.4%	23.2	76.9%	22.3	74.1%
2,3-Dimethylpentane	30.1	31.0	103.1%	29.9	99.2%	33.5	111.4%	32.9	109.4%	33.9	112.5%
3-Methylhexane	29.4	27.8	94.6%	26.6	90.6%	28.9	98.4%	28.8	98.0%	28.5	96.8%
2,2,4-Trimethylpentane	33.6	31.1	92.6%	30.6	91.2%	30.9	92.0%	31.7	94.4%	32.1	95.4%
n-Heptane	29.4	27.1	92.1%	26.4	89.7%	27.0	91.9%	27.3	92.9%	26.3	89.5%
Methylcyclohexane	29.4	27.7	94.1%	26.8	91.2%	28.0	95.2%	28.0	95.3%	28.9	98.4%
2,3,4-Trimethylpentane	32.8	29.3	89.5%	29.5	89.8%	28.4	86.7%	29.0	88.5%	30.5	92.9%
Toluene	29.4	26.4	89.7%	24.8	84.5%	25.2	85.9%	24.6	83.8%	26.7	90.7%
2-Methylheptane	33.6	29.5	87.8%	29.8	88.8%	29.9	88.9%	29.0	86.4%	30.4	90.4%
3-Methylheptane	33.6	30.2	89.8%	29.8	88.8%	31.3	93.2%	30.0	89.3%	31.2	92.9%
n-Octane	32.8	30.1	91.7%	29.5	89.8%	30.2	92.2%	29.6	90.3%	31.2	95.1%
Ethylbenzene	33.6	27.3	81.2%	27.5	81.7%	26.3	78.2%	26.3	78.4%	27.5	81.9%
M&P-Xylene	65.6	53.4	81.3%	53.7	81.8%	50.7	77.3%	50.4	76.8%	54.4	82.9%
Styrene	32.8	24.6	75.1%	24.4	74.4%	21.8	66.5%	22.2	67.6%	20.4	62.3%
O-Xylene	32.8	27.9	85.1%	28.3	86.4%	27.5	83.9%	25.8	78.7%	29.7	90.6%
N-Nonane	36.0	31.6	87.7%	32.2	89.4%	31.4	87.2%	29.4	81.7%	33.2	92.1%
Isopropylbenzene	36.0	29.5	82.0%	30.6	85.1%	29.3	81.3%	28.9	80.3%	30.0	83.3%
n-Propylbenzene	35.1	28.6	81.5%	29.5	84.1%	28.0	79.8%	27.7	79.0%	29.5	83.9%
1,3,5-Trimethylbenzene	36.0	26.4	73.3%	29.9	83.1%	29.4	81.6%	27.4	76.1%	29.3	81.3%
1,2,4-Trimethylbenzene	36.0	27.2	75.5%	28.2	78.2%	27.1	75.2%	25.7	71.5%	27.5	76.4%
n-Decane	41.0	31.6	77.0%	32.7	79.7%	33.0	80.5%	29.7	72.3%	33.2	81.0%
1,2,3-Trimethylbenzene	35.1	24.0	68.3%	24.8	70.6%	22.0	62.7%	23.5	66.9%	23.5	67.1%
n-Undecane	42.9	27.3	63.6%	26.8	62.4%	23.7	55.2%	25.2	58.8%	29.3	68.4%