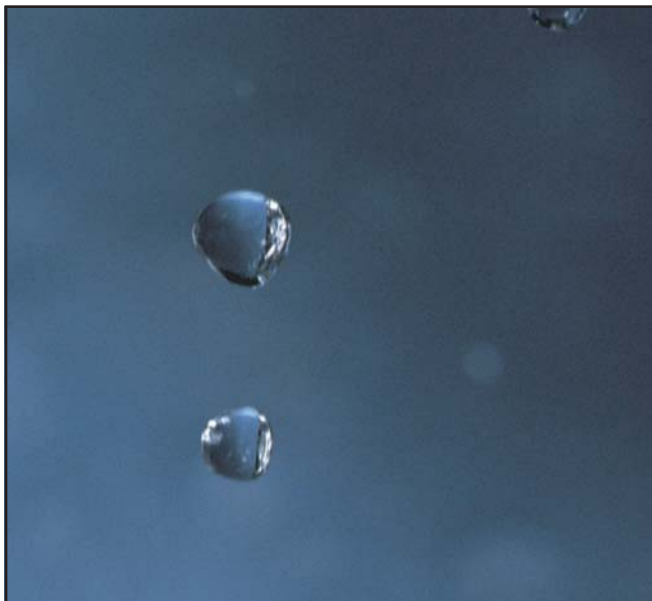


# Cooling Tower Emissions

Analysis by Gas Chromatography



*Engineered Solutions, Guaranteed Results.*



WASSON-ECE  
INSTRUMENTATION

# Cooling Tower Analysis

## Reliability

Delivering maximum up time through quality engineering

## Precision

Generating repeatable data through innovative engineering

## Efficiency

Providing high speed multi-dimensional chromatography

Wasson-ECE Instrumentation has developed on-line analyzers specifically designed to meet the analytical requirements for cooling tower emissions monitoring. Unlike the competitor's solution, this analyzer is also compliant with TCEQ Appendix P, the El Paso Stripper method, making Wasson-ECE the complete solution for cooling tower emissions monitoring.

## Analyzer Features

Automated calorific value calculation

HR-VOC detection limit to 50 ppm for each component

Pre-column to remove interferences

Run time of less than 15 minutes

Automatic daily verification check in compliance with TCEQ guidelines



The stand-alone cabinet is purged, air-conditioned, and rated for outside use in Class I, Division 2, Groups C and D hazardous areas. This cabinet requires no shelter and is a cost-effective solution.

The on-line bench top instrument is positioned in one of our complete instrument shelters. The separate sample system is rated for hazardous areas and is mounted on the exterior wall of the shelter. The shelter is air-conditioned, X-Purged, and outfitted with hydrocarbon sensors for use in Class I, Division 2 plant locations.

# Advantages

## The Wasson-ECE Advantage

### Method Compliance

Wasson-ECE's sample system is completely compliant with the TCEQ Source Sampling Procedures Manual Appendix P method for cooling tower monitoring (the El Paso Stripper method). This removes the questions that may arise by using an alternative method.

### Sample Handling

Cooling towers present very difficult samples to analyze. Often these samples may contain biocides, heavy organics, and particulates. Wasson-ECE's sample system is custom designed for the maximum amount of up time.

### Positive Component Identification

Wasson-ECE's cooling water analyzer uses capillary columns that provide a much higher resolution than the packed columns used by most on-line GC vendors. This avoids many of the conflicts that can be caused by interfering chemicals.



## What are HR-VOCs?

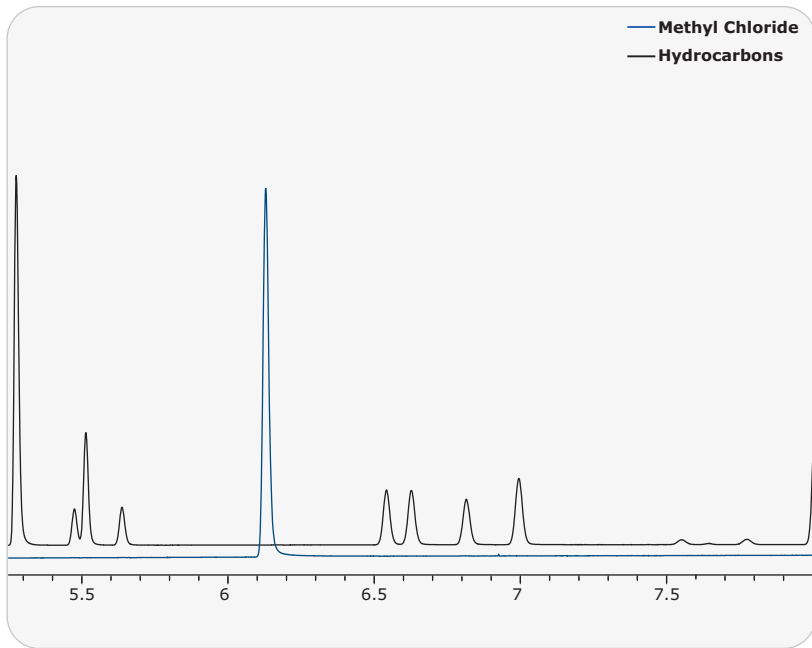
Highly reactive volatile organic components (HR-VOCs) are light olefins that act as ozone precursors. HR-VOCs in Harris County are defined as ethylene, propylene, 1,3-butadiene, and butenes. HR-VOCs in the Houston and Galveston area counties surrounding Harris county are defined as ethylene and propylene.



## Why Cooling Tower Emissions?

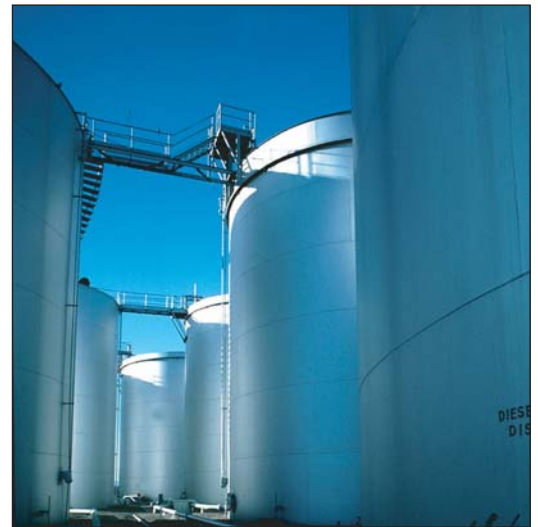
Leaks in plant heat exchangers allow HR-VOCs to be transferred from the process fluid into the cooling water. During evaporation of the cooling water, these HR-VOCs can be released into the atmosphere.

# Cooling Tower Analysis



## Interference Control

Wasson-ECE has tested the cooling tower analyzer for a variety of components that could cause possible interferences. The only component not removed is methyl chloride, but as shown in the chromatogram on the left, does not interfere with the components of interest.



## Retention Time (min) Repeatability

Run	Ethylene	Propylene	1,3-Butadiene
1	3.889	4.939	8.026
2	3.897	4.994	8.026
3	3.896	4.943	8.026
4	3.893	4.941	8.025
5	3.892	4.941	8.025
6	3.893	4.941	8.025
7	3.891	4.940	8.025
8	3.889	4.938	8.024

\* 9.25 min cycle time, temperature and pressure programs are utilized.

## Repeatability

Repeatability is critical in ensuring that results are accurate over time. The table to the left shows the excellent repeatability of Wasson-ECE with an average RSD of only 0.16 %.

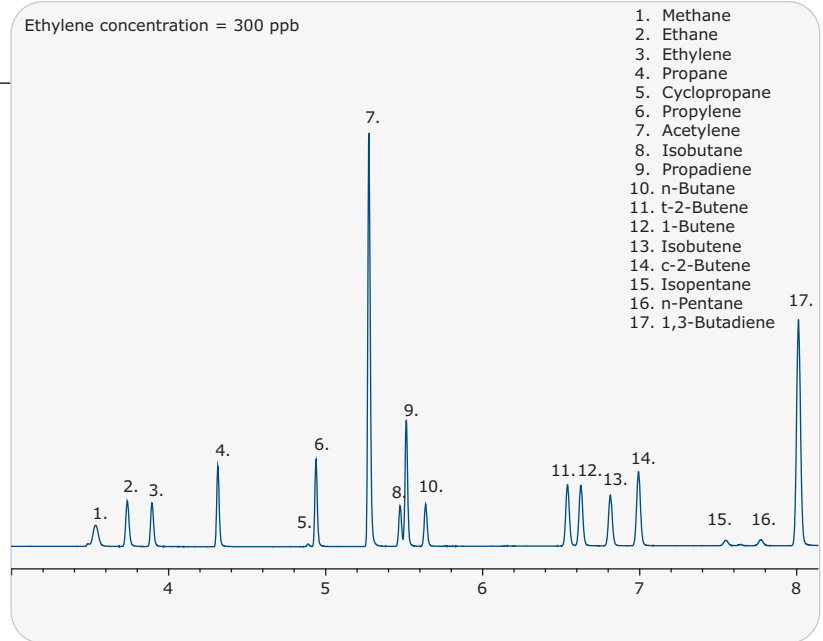
# Cooling Tower Analysis

## Resolution

This chromatogram demonstrates how the HR-VOCs specified by TCEQ are fully resolved from the non-regulated components.

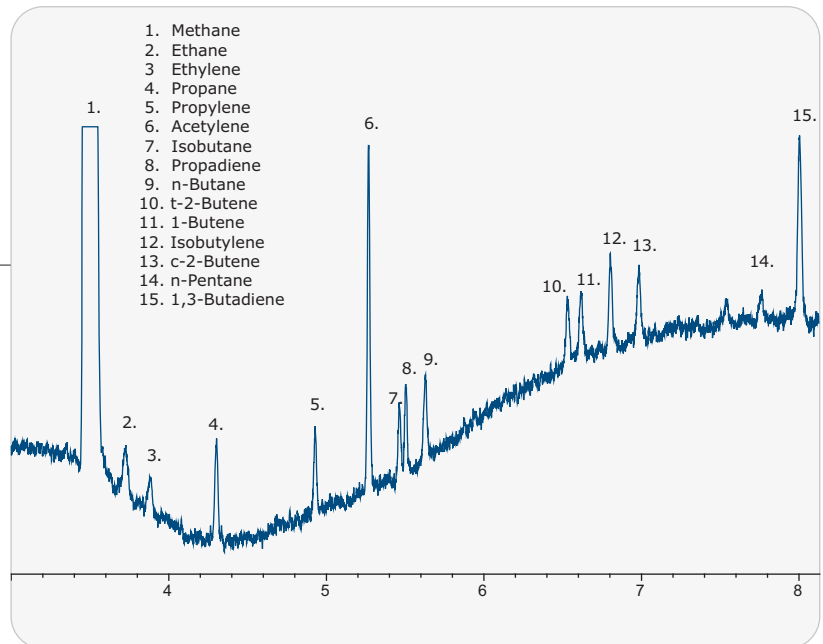


Ethylene concentration = 300 ppb



## Sensitivity

TCEQ regulations require a lower detection limit of 10 ppb by volume in water per HR-VOC component. The attached chromatogram displays a fully resolved ethylene peak at a concentration of 2 ppb.



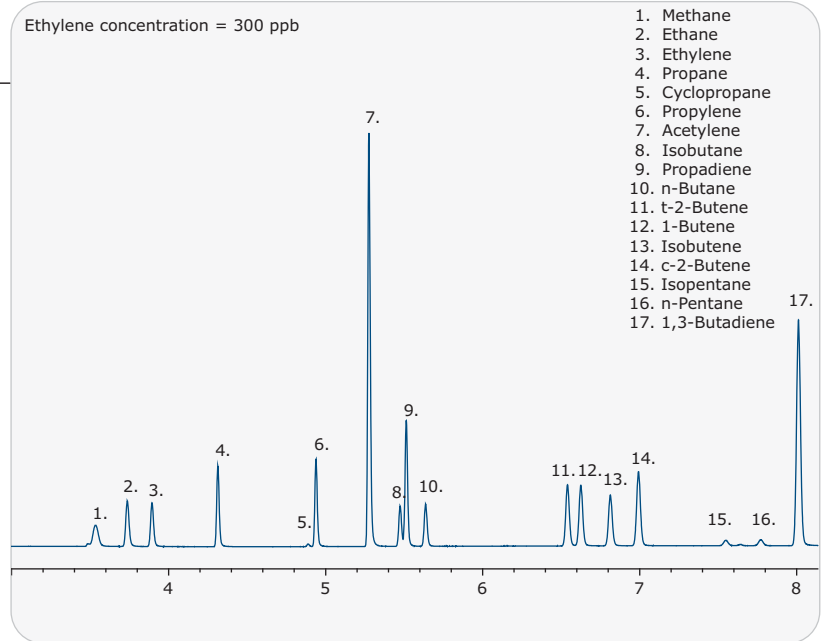
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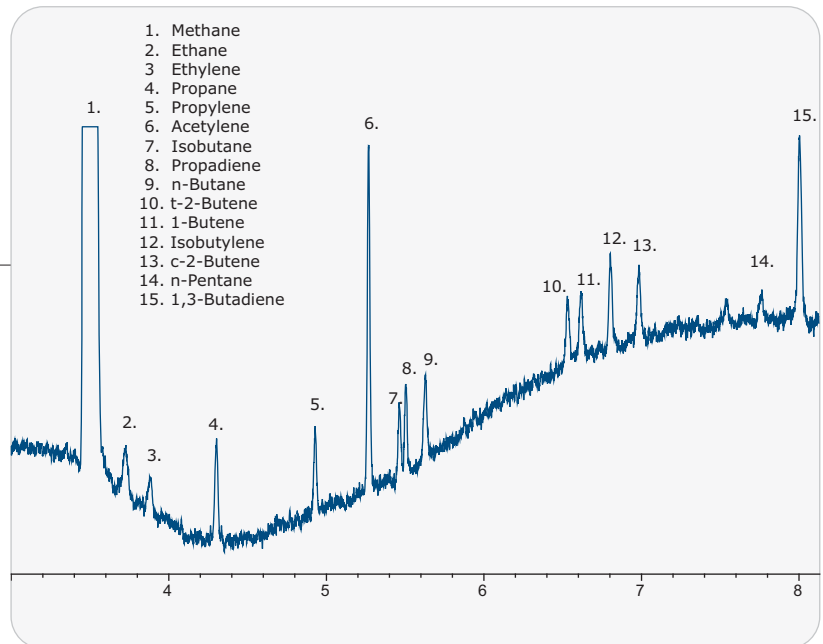


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# Sparge Sampling System

## Sparge Air Control

Pressure transducers for monitoring sparge air supply alert the user of problems. Both an electronic mass flow controller and a visual flow meter are employed for sparge flow monitoring.

## Sparge Vessel

This tube is fully compliant with the El Paso Stripper method. A sensor is used to measure sample temperature for use in the TCEQ specified calculation.

## Water Sample

A water flow meter is used for the TCEQ specified calculation. An advanced filtration system is utilized with automated backflush.

## Back Pressure Control

A low pressure regulator is used to provide flow to a gas chromatograph gas sampling valve.

## Enclosure Specifications

Each enclosure includes a thermostatically controlled heater, hand valve to drain the vessel, zero air generator, and a sample connection for connecting bags or canisters.

## Sparge Tube



# Process Configurations



## Process Analyzer Options

The gas chromatograph can be housed in a Class I, Division 2 stand-alone cabinet, or it can be placed in an instrument shelter complete with air conditioning, X-Purge, and hydrocarbon sensors rated for Class I, Division 2.

## Process Specifications

Class I, Division 2, Group C and D

On-line sample acquisition

Multi-stream, multi-method capability

Data output using Modbus or 4-20 mA

Stand alone unit requiring no additional shelter

Onboard database capabilities for logging results

Remote monitoring by on-site personnel or Wasson-ECE service engineers





Please contact us for more information



*Engineered Solutions, Guaranteed Results.*