

**SUMMARY SHEET 25**  
**Total Gaseous Nonmethane Organic Emissions as Carbon**

		Run #1	Run #2	Run #3	Avg
Client/Plant Name	FDS 25				
Job No.	FDS 25				
Sampling Location	FDS 25				
Run ID #	FDS 25				
Test Date	FDS 25				
Run Start Time	FDS 25				
Run Finish Time	FDS 25				
Sample Tank Volume, L	V	FDS 25			
Pre-test Barometric Pressure, mm Hg	P <sub>b</sub>	FDS 25			
Pre-test Tank Pressure, mm Hg	P <sub>ti</sub>	FDS 25			
Post-test Tank Pressure, mm Hg	P <sub>t</sub>	FDS 25			
Pre-test Tank Temperature, °C	t <sub>ti</sub>	FDS 25			
Abs. Pre-test Tank Temperature (t <sub>ti</sub> + 273), K	T <sub>ti</sub>	SS 25			
Post-test Tank Temperature, °C	t <sub>t</sub>	FDS 25			
Abs. Post-test Tank Temperature, K	T <sub>t</sub>	SS 25			
Daily Response Factor for CO <sub>2</sub>	DRF <sub>CO2</sub>	LDS 25a			
Daily Response Factor for NMO	DRF <sub>NMO</sub>	LDS 25a			
ICV Volume, m <sup>3</sup>	V <sub>v</sub>	LDS 25a			
ICV Final Pressure, mm Hg	P <sub>f</sub>	LDS 25a			
ICV Final Temperature, K	T <sub>f</sub>	LDS 25a			
Final Tank Pressure, mm Hg	P <sub>tf</sub>	LDS 25a			
Final Tank Temperature, K	T <sub>tf</sub>	LDS 25a			
Volume of Metered Gas Sample, dscm	V <sub>s</sub>	SS 25			
<b><u>Concentration of Noncondensibles</u></b>					
Organics in Tank, ppm C	C <sub>tm</sub>	LDS 25a			
Organics in Stack, ppm C	C <sub>t</sub>	SS 25			
<b><u>Concentration of Condensibles</u></b>					
Organics in ICV, ppm C	C <sub>cm</sub>	LDS 25a			
Organics in Stack, ppm C	C <sub>c</sub>	SS 25			
<b><u>TGNMO Concentration in Stack</u></b>					
TGNMO Concentration, ppm C	C	SS 25			
TGNMO Concentration, mg C/dscm	m <sub>c</sub>	SS 25			
Audit Relative Error, %	RE	QA 1			

$$V_s = 0.3857 V \left[ \frac{P_t}{T_t} - \frac{P_{ti}}{T_{ti}} \right]$$

$$C_c = 0.3857 \frac{V_v P_f}{V_s T_f} C_{cm}$$

$$C_t = \left[ \frac{\frac{P_{tf}}{T_{tf}}}{\frac{P_t}{T_t} - \frac{P_{ti}}{T_{ti}}} \right] C_{tm}$$

$$C = C_t + C_c$$

$$m_c = 0.4993 C$$

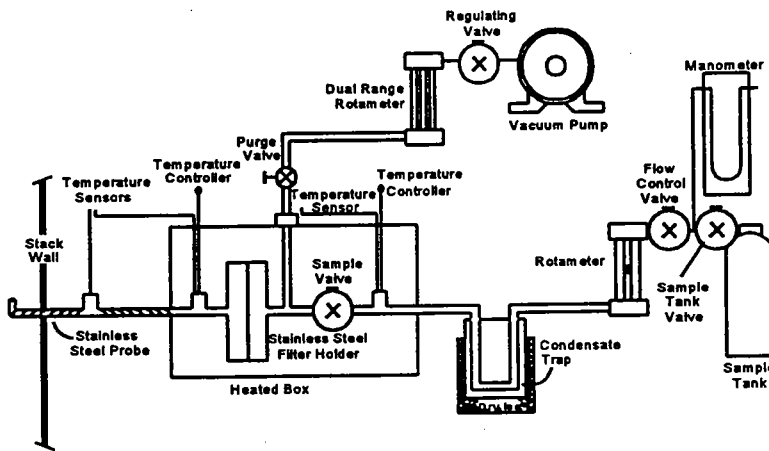


Figure F25-1. Sampling Train.

**FIELD PROCEDURE 25**  
**Total Gaseous Nonmethane Organic Emissions as Carbon**

*Note: The forms in this section contain the information required by the test method; we are aware that some of the technology specified in the test method is obsolete. In these cases, the user should modify the forms to make them consistent with the technology used.*

**A. Sampling**

1. Determine the sample tank volume by weighing it empty and then filling with deionized distilled water; weigh to  $\pm 5$  g, and record. Alternatively, measure the volume of water used to  $\pm 5$  mL.
2. Select a total sample time  $\geq$  minimum sampling time specified in the applicable subpart of the regulation, and calculate sampling rate based on sample tank volume.
3. Leak-check the sample tank as follows: Evacuate the sample tank to 10 mm Hg absolute pressure or less. Then close the sample tank valve, and allow the tank to sit for 30 min. The tank vacuum must not change  $> \pm 2$  mm Hg. This step may be conducted either in the laboratory or the field.
4. Just before assembly, measure the tank vacuum with a mercury U-tube manometer. Record this vacuum, the ambient temperature, and the barometric pressure at this time. Close the sample tank valve and assemble the sampling system as shown in Figure F25-1. Immerse the condensate trap body in dry ice. Keep the point where the inlet tube joins the trap body 2.5 to 5 cm above the top of the dry ice.
5. **Mandatory:** Calculate or measure the approximate volume of the sampling train from the probe tip to the sample tank valve. After assembling the sampling train, plug the probe tip, and make certain that the sample tank valve is closed. Turn on the vacuum pump, and evacuate the sampling system from the probe tip to the sample tank valve to  $\leq 10$  mm Hg absolute pressure. Close the purge valve, turn off the pump, wait  $\leq 5$  min, and recheck the indicated vacuum (this constitutes the leak-check). Calculate the maximum  $\Delta p$  in cm Hg ( $\leq 1\%$  of sampling rate); see FDS 25.
6. Unplug the probe tip, and place the probe into the stack perpendicular to the duct or stack axis; locate the probe tip at a single preselected point of average velocity facing nozzle away from the direction of gas flow. Seal the sample port sufficiently to prevent air in-leakage around the probe.
7. Set the probe temperature controller to 129°C and the filter temperature controller to 121°C. Allow the probe and filter to heat for about 30 min before purging the sample train.
8. Close the sample valve, open the purge valve, and start the vacuum pump. Set the purge rate between 60 and 100 cc/min, and purge the train with stack gas for  $\geq 10$  min.
9. Check the dry ice level around the condensate trap, and add dry ice if necessary. Record the clock time. Wait until the temperatures at the exit ends of the probe and filter are within their specified range, then close the purge valve and stop the pump. Open the sample valve and the sample tank valve.
10. Set the flow control valve to the selected sampling rate, and maintain a constant rate ( $\pm 10\%$ ) during sampling.
11. Record the sample tank vacuum and flowmeter setting at 5-min intervals. (See FDS 25). End the sampling when required sampling time is reached or when a constant flow rate cannot be maintained because of reduced sample tank vacuum.
12. **Note:** If sampling is stopped because of the latter condition in step A11, proceed as follows: After closing the sample tank valve, remove the used sample tank from the sampling train (without disconnecting other portions of the sampling train). Take another evacuated and leak-checked sample tank, measure and record the tank vacuum, and attach the new tank to the sampling train. Proceed with the sampling until the required minimum sampling time has been exceeded.
13. After sampling is completed, close the flow control valve, and record the final tank vacuum; then record the tank temperature and barometric pressure.

**B. Sample Recovery**

1. Close the sample tank valve, and disconnect the sample tank from the sample system.
2. Disconnect the condensate trap at the flow metering system, and tightly seal both ends of the condensate trap. Do not include the probe from the stack to the filter as part of the condensate sample.

3. Keep the trap packed in dry ice until the samples are returned to the laboratory for analysis.
4. Identify and label the condensate trap and the sample tank(s).

**Notes**

1. Organic particulate matter interferes, but is eliminated by particulate filter.
2. Absorbed CO<sub>2</sub> in condensed water produce a positive bias. Determine CW = (%CO<sub>2</sub>)(%H<sub>2</sub>O). As a guideline, if CW is ≤100, the bias can be considered insignificant. Thus, a source having 10% CO<sub>2</sub> and 10% water vapor would not have a significant bias, but a source having 10% CO<sub>2</sub> and 20% water vapor might have a significant bias.

3. This method tends to give high biases for low concentrations (≤100 ppm C) and low bias for high concentrations. For low concentrations, consider Method 25A.
4. For low molecular weight organics, consider a totally automated semicontinuous nonmethane organics (NMO) analyzer interfaced directly to the source.



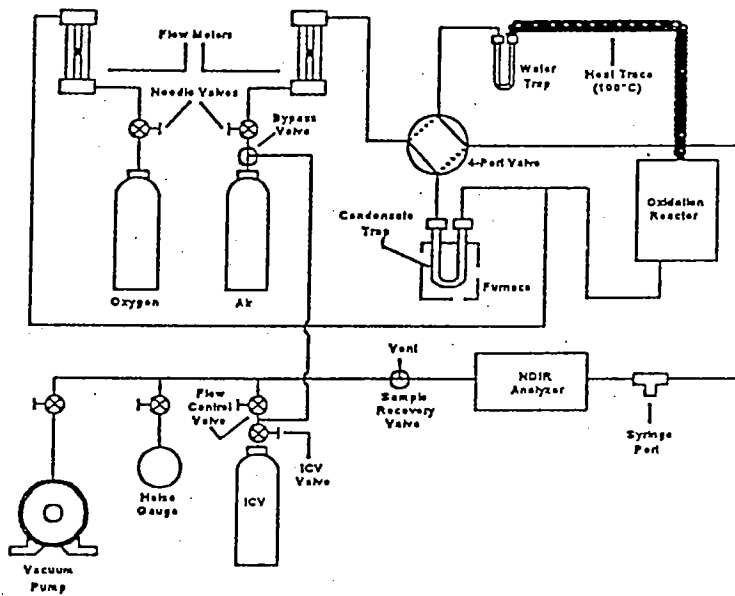


Figure L25-1. Condensate Recovery System.

**LABORATORY PROCEDURE 25**  
**Total Gaseous Nonmethane Organic Emissions as Carbon**

**A. Calibration Standards**

Each calibration gas must have a manufacturer recommended maximum shelf life (i.e., no change  $> \pm 5\%$  from its certified value), date of gas cylinder preparation, and certified organic concentration affixed to the cylinder before shipment to the buyer. Obtain the following standard gas mixtures:

1. Propane: nominal 20 ppm, 200 ppm, and 3000 ppm, in air.
2. Methane: nominal 1%, in air.
3. CO<sub>2</sub>: nominal 50 ppm, 500 ppm, and 1%, in air. The 1% mixture must have  $< 1$  ppm nonmethane organics (NMO).
4. Propane Mixture: nominal 50 ppm CO, 50 ppm CH<sub>4</sub>, 2% CO<sub>2</sub>, and 20 ppm C<sub>3</sub>H<sub>8</sub>, in air.
5. Hexane: nominal 50 ppm, in air.
6. Toluene: nominal 20 ppm, in air.
7. Methanol: nominal 100 ppm, in air.

**B. Equipment Preparation**

1. Perform all the necessary functions to bring the analyzer into proper working order.
2. Set the carrier gas flow to 29.5 cc/min He and 2.2 cc/min O<sub>2</sub>. Set the column oven to 85°C.

**C. NMO Analyzer Performance Test**

Perform these tests before the system is first placed in operation, after any shutdown  $> 6$  months, and after any major modification of the system.

1. **Oxidation Catalyst Efficiency Check.** Turn off or bypass the NMO analyzer reduction catalyst. Make triplicate injections of 1% methane standard, and average the FID response for unoxidized CH<sub>4</sub> (must be  $< 1\%$  of the methane concentration).
2. **Reduction Catalyst Efficiency Check.** With the oxidation catalyst unheated or bypassed and the heated reduction catalyst bypassed, make triplicate injections of 1% methane standard, and average the FID response. Repeat this procedure with both catalysts operative (must be  $\pm 5\%$  of each other).
3. **Analyzer Linearity Check and NMO Calibration.** While operating both the oxidation and reduction catalysts,
  - a. Make triplicate injections of each propane standard (A1), and calculate the average response factor (area/ppm C) for each concentration, relative standard deviation or RSD ( $\leq 2\%$ ) and the overall mean or RF<sub>NMO</sub> ( $\leq \pm 2.5\%$  of average).
  - b. Make triplicate injections of each CO<sub>2</sub> standard (A3), and calculate the average response factor (area/ppm C) for each concentration, RSD ( $\leq \pm 2\%$ ), and the overall mean response factor (RF<sub>CO<sub>2</sub></sub>) ( $\leq \pm 2.5\%$ ). In addition, RF<sub>CO<sub>2</sub></sub>  $\leq 10\%$  of RF<sub>NMO</sub>.
4. **System Performance Check.** Make triplicate injections of the calibration gases listed in A4 through A7, and average (measured NMO value for each gas must be  $\leq \pm 5\%$  of the expected value).

**D. Performance Check of Condensate Recovery Apparatus**

Perform these tests before the system is first placed in operation, after any shutdown of  $\geq 6$  months, and after any major modification of the system, or at the specified frequency.

1. **Carrier Gas and Auxiliary O<sub>2</sub> Blank Check.** Analyze each new tank of carrier gas or auxiliary O<sub>2</sub> with the NMO analyzer to check for contamination.
  - a. Purge the sample loop with the cylinder gases, and then inject the sample into the NMO analyzer. After the CO<sub>2</sub> (if any) elutes (about 100 sec under the specified operating conditions) and as soon as the detector response returns to baseline following the CO<sub>2</sub> peak, switch the carrier gas flow to backflush, and raise the column oven temperature to 195°C as rapidly as possible (e.g., 30°C/min).
  - b. Record any measured CH<sub>4</sub>, CO, CO<sub>2</sub>, or NMO, and sum. Return the column oven temperature to 85°C before the next analysis. Analyze each cylinder gas in triplicate, and average (the sum of the averages must be  $< 5$  ppm).
2. **System Performance Check.** Construct and insert a liquid sample injection unit (see Figure L25-1) into the condensate recovery and conditioning system in place of a condensate trap, and set the carrier gas and auxiliary O<sub>2</sub> flow rates to normal operating levels. Proceed as follows:

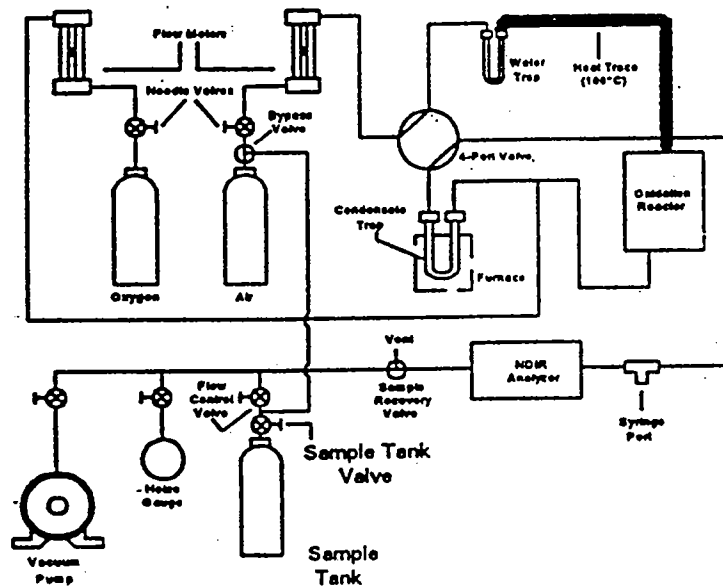


Figure L25-2. Condensate Recovery System. CQ purge.



- a. Attach an evacuated intermediate collection vessel (ICV) to the system, and switch from system vent to collect. With the carrier gas routed through the injection unit and the oxidation catalyst, make separate injections (in triplicate) of **50  $\mu$ L hexane, 10  $\mu$ L hexane, 50  $\mu$ L decane, and 10  $\mu$ L decane** into the injection port.
- b. Follow the procedure in step G to recover the sample. Measure the final ICV pressure, and then analyze the vessel to determine the CO<sub>2</sub> concentration.
- c. For each injection, calculate the %recovery and average (must be 100  $\pm$  10% with a relative standard deviation <5% for each set of triplicate injections).

#### E. NMO Analyzer Daily Calibration

Conduct these steps before and immediately after the analysis of each set of samples or on a daily basis (whichever occurs first).

1. CO<sub>2</sub> Response Factor. Conduct step C3b with 1% CO<sub>2</sub> calibration gas (must be  $\leq \pm 5\%$  of the initial RF<sub>CO<sub>2</sub></sub> (step C3b). Use this daily response factor (DRF<sub>CO<sub>2</sub></sub>) for analyzer calibration and the calculation of measured CO<sub>2</sub> concentrations in the ICV samples.
2. NMO Response Factors. Conduct step C4 with only the propane mixture standard (A4) (must be  $\leq \pm 5\%$  of the initial RF<sub>NMO</sub> (step C4). Use this daily response factor (DRF<sub>NMO</sub>) for analyzer calibration and calculation of NMO concentrations in the sample tanks.

#### F. Condensate Recovery System Check

See Figure L25-2. Each day before analyzing any samples, perform the following tests:

1. Leak-Check. With the carrier gas inlets and the sample recovery valve closed, install a clean condensate trap in the system, and evacuate the system to  $\leq 10$  mm Hg absolute pressure. Pressure change must be <2 mm Hg after 10 min.
2. System Background Test. Adjust the carrier gas and auxiliary O<sub>2</sub> flow rate to their normal values of 100 cc/min and 150 cc/min, respectively, with the sample recovery valve in vent position. Using a 10-mL syringe withdraw a sample from the system effluent through the syringe port. Inject this sample into the NMO analyzer, and measure the CO<sub>2</sub> content (must be <10 ppm).

3. Catalyst Efficiency Check. Conduct this check as follows:

- a. Replace the carrier gas cylinder with the 1% methane standard. Set the four-port valve to the recovery position, and attach an ICV to the recovery system. With the sample recovery valve in vent position and the flow-control and ICV valves fully open, evacuate the manometer or gauge, the connecting tubing, and the ICV to  $\leq 10$  mm Hg absolute pressure. Close the flow-control and vacuum pump valves.
- b. After the NDIR response has stabilized, switch the sample recovery valve from vent to collect. When the manometer or pressure gauge begins to register a slight positive pressure, open the flow-control valve. Adjust the flow to maintain atmospheric pressure  $\pm 10\%$  in the system. Continue collecting the sample in a normal manner until the ICV is filled to a nominal gauge pressure of 300 mm Hg.
- c. Close the ICV valve, and remove the ICV from the system. Place the sample recovery valve in the vent position, and return the recovery system to its normal carrier gas and normal operating conditions. Analyze the ICV for CO<sub>2</sub> using the NMO analyzer (must be  $\leq \pm 2\%$  of the methane standard concentration).

#### G. Condensate Trap CO<sub>2</sub> Purge and Sample Tank Pressurization and Analysis

Before analysis, the NMO and recovery systems must have met the performance specifications in steps C through F. The condenser trap may contain significant amounts of CO<sub>2</sub>, which must be removed before analyzing. To avoid loss of any condensed organics and residual sample gases, the trap is purged with zero air and the purged gases are collected in the original sample tank.

1. Set the four-port valve of the condensate recovery system in the CO<sub>2</sub> purge position as shown in Figure L25-2. With the sample tank valve closed, attach the sample tank to the sample recovery system. With the sample recovery valve in the vent position and the flow control valve fully open, evacuate the manometer or pressure gauge to the vacuum of the sample tank. Next, close the vacuum pump valve, open the sample tank valve, and record the tank pressure.

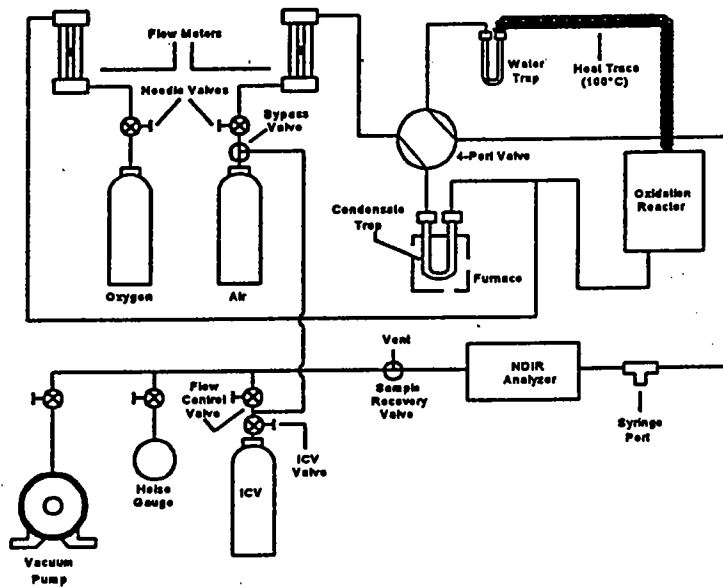


Figure L25-3. Condensate Recovery System, collection of trap organics.

2. Attach the dry-ice-cooled condensate trap to the recovery system, and initiate the purge by switching the sample recovery valve from vent to collect position. Adjust the flow control valve to maintain atmospheric pressure in the recovery system. Continue the purge until CO<sub>2</sub> in the trap effluent is < 5 ppm.
  3. After the NDIR response has reached a minimum level, extract with a 10-mL syringe a sample from the syringe port before the NDIR, and analyze CO<sub>2</sub> in the trap effluent with the NMO analyzer.
  4. After the completion of the CO<sub>2</sub> purge, use the carrier gas bypass valve to pressurize the sample tank to approximately 1,060 mm Hg absolute pressure with zero air.
  5. Analyze the sample for NMO in the sample tank as in step D, except purge the loop with sample.
4. Begin heating the tubing that connected the heated sample box to the condensate trap only after CO<sub>2</sub> falls below 10,000 ppm. This tubing may be heated in the same oven as the condensate trap or with an auxiliary heat source such as a heat gun. Heating temperature must not exceed 200°C. If a heat gun is used, heat the tubing slowly along its entire length from the upstream end to the downstream end, and repeat the pattern for a total of three times. Continue the recovery until CO<sub>2</sub> drops to < 10 ppm as determined by syringe injection as described under the condensate trap CO<sub>2</sub> purge procedure, step G3.
  5. After the sample recovery is completed, use the carrier gas bypass valve to pressurize the ICV to approximately 1060 mm Hg absolute pressure with zero air.
  6. Analyze the recovered condensate sample as in step D1a, except purge loop with sample and record the value obtained for the condensible organic material (C<sub>cm</sub>) measured as CO<sub>2</sub> and any measured NMO.

#### ***H. Recovery of the Condensate Trap Sample and Analysis***

1. See Figure L25-3. Attach the ICV to the sample recovery system. With the sample recovery valve in a closed position, between vent and collect, and the flow control and ICV valves fully open, evacuate the manometer or gauge, the connecting tubing, and the ICV to 10 mm Hg absolute pressure. Close the flow-control and vacuum pump valves.
2. Begin auxiliary oxygen flow to the oxidation catalyst at a rate of 150 cc/min, then switch the four-way valve to the trap recovery position and the sample recovery valve to collect position (see Figure L25-3). After the manometer or pressure gauge begins to register a slight positive pressure, open the flow control valve. Adjust the flow-control valve to maintain atmospheric pressure in the system within ± 10%.
3. Now, remove the condensate trap from the dry ice, and allow it to warm to ambient temperature while monitoring the NDIR response. If after 5 min, CO<sub>2</sub> in the catalyst effluent is below 10,000 ppm, stop the auxiliary oxygen flow to the oxidation catalyst. Begin heating the trap by placing it in a furnace preheated to 200°C. Once heating has begun, carefully monitor the NDIR response to ensure that the catalyst effluent concentration does not exceed 50,000 ppm. Whenever CO<sub>2</sub> exceeds 50,000 ppm, supply auxiliary oxygen to the catalyst at the rate of 150 cc/min.

#### **I. Audit Samples**

If appropriate, analyze the audit samples.

**LABORATORY DATA SHEET 25**  
**Total Gaseous NonMethane Organic Emissions as Carbon**

Client/Plant Name \_\_\_\_\_ Job # \_\_\_\_\_  
 City/State \_\_\_\_\_ Date \_\_\_\_\_  
 Analyzer ID # \_\_\_\_\_ Trap I.D. \_\_\_\_\_ Analyst \_\_\_\_\_

**Performance Test**

Sample ID or Condition	FID Area 1	FID Area 2	FID Area 3	Avg A	Avg RF (ppmC/Area)	RSD (%)	Diff. from Avg
<b>Oxidation Catalyst Efficiency Test: 1% CH<sub>4</sub> Certified Concentration _____</b>							
Red. cat. off/bypassed							
RF (from cal) x A = _____ ppm (< ± 1% of certified concentration?)							
<b>Reduction Catalyst Efficiency Check: 1% CH<sub>4</sub> Certified Concentration _____</b>							
Both catalysts off/bypassed							
Both catalysts operative							
A(on)/A(off) = _____ (≥ 0.95?)							
<b>Linearity Check</b>					<i>Note: Differences are calculated from overall average.</i>		
20 ppm C <sub>3</sub> H <sub>8</sub> Certified Conc. _____							
200 ppm C <sub>3</sub> H <sub>8</sub> Certified Conc. _____							
3,000 ppm C <sub>3</sub> H <sub>8</sub> Certified Conc. _____							
RSD < ± 2%? Avg RF of each cal gas < ± 2.5% of RF <sub>NMO</sub> ? RF <sub>NMO</sub> = Avg							
50 ppm CO <sub>2</sub> Certified Conc. _____							
500 ppm CO <sub>2</sub> Certified Conc. _____							
1% CO <sub>2</sub> Certified Conc. _____							
RSD < ± 2%? Avg RF of each cal gas ≤ ± 2.5% of RF <sub>CO2</sub> ? RF <sub>CO2</sub> = Avg							RF <sub>CO2</sub> ≤ 10% RF <sub>NMO</sub> ?
<b>System Performance Check</b>					Conc, ppm		
Propane Mixture Certified Conc. _____							
50 ppm Hexane Certified Conc. _____							
20 ppm Toluene Certified Conc. _____							
100 ppm Methanol Certified Conc. _____							
_____ Each gas value < ± 5% of the certified conc.?							

**LABORATORY DATA SHEET 25 (Continued)**  
**Condensate Recovery Apparatus**

Sample ID#	Injection 1 Area	Injection 2 Area	Injection 3 Area	Average Area	Conc, (ppm)	RSD (%)	% Recovery
<b>Carrier Gas or Auxiliary O<sub>2</sub> Blank Check:</b>				<b>Cylinder ID # _____</b>			
CH <sub>4</sub>							
CO							
CO <sub>2</sub>							
NMO							
				Sum			
_____ Sum of CH <sub>4</sub> , CO, CO <sub>2</sub> , or NMO concentration in the cylinder ≤ 5 ppm?							
<b>System Performance Check: Concentrations are for ppm CO<sub>2</sub>, C<sub>cm</sub></b>							
50 μL Hexane							
10 μL Hexane							
50 μL Decane							
10 μL Decane							
_____ Average % recovery 100 ± 10% and RSD < 5% for each set of triplicate injections?							

Molecular Weight of Injection Liquid, m      Hexane = \_\_\_\_\_      Decane = \_\_\_\_\_      g/g-mole

Liquid Volume Injected, L      10 or 50 μL

Density of Liquid Injected, ρ      Hexane = \_\_\_\_\_      Decane = \_\_\_\_\_      g/cc

Number of Carbon in Liquid, N      Hexane = 6      Decane = 10

Intermediate Tank Volume, V<sub>v</sub>      \_\_\_\_\_ m<sup>3</sup>

$$\% \text{Recovery} = 1.604 \frac{m}{L} \frac{V_v}{\rho} \frac{P_f}{T_f} \frac{C_{cm}}{N}$$

$$\% \text{Recovery} = 1.604 \frac{m}{L} \frac{V_v}{\rho} \frac{P_f}{T_f} \frac{C_{cm}}{N}$$

**QA/QC Check**

Completeness \_\_\_\_\_      Legibility \_\_\_\_\_      Accuracy \_\_\_\_\_      Specifications \_\_\_\_\_      Reasonableness \_\_\_\_\_

Checked by:

\_\_\_\_\_  
Analyst (Signature/Date)

\_\_\_\_\_  
Team Leader (Signature/Date)

**LABORATORY DATA SHEET 25a**  
**Total Gaseous Organic Emissions as Carbon**

Client/Plant Name \_\_\_\_\_ Job # \_\_\_\_\_

City/State \_\_\_\_\_ Date \_\_\_\_\_

Analyzer ID # \_\_\_\_\_ Analyst \_\_\_\_\_

**NMO Operating Conditions**He carrier gas flow [29.5 cc/min] \_\_\_\_\_ cc/min O<sub>2</sub> carrier gas flow [2.2 cc/min] \_\_\_\_\_ cc/min

Column Oven Temp. [85 °F] \_\_\_\_\_ °F

**Note:** Use the daily response factors ( $DRF_{CO_2}$  or  $DRF_{NMO}$ ) for analyzer calibration and calculation of CO<sub>2</sub> in ICV and NMO in sample tank.

**Daily Calibration**

Sample ID#	Area 1	Area 2	Area 3	Avg. Area	DRF
<b>NMO Analyzer CO<sub>2</sub> Response Factor:</b>					
1% CO <sub>2</sub> Certified Concentration _____					
_____ $DRF_{CO_2} \leq \pm 5\%$ of the initial $RF_{CO_2}$ (from LDS 25)?					
<b>NMO Response Factors: Analyze for propane only.</b>					
Propane Mixture Certified Conc. _____					
_____ $DRF_{NMO} \leq \pm 5\%$ of the initial $RF_{NMO}$ (from LDS 25)?					
<b>Condensate Recovery System Background Test</b>					ppm CO <sub>2</sub>
System Effluent, CO <sub>2</sub>					
_____ CO <sub>2</sub> content <10 ppm?					
<b>Condensate Recovery System Catalyst Efficiency Check</b>					ppm CO <sub>2</sub>
1% CH <sub>4</sub> Certified Conc. _____					
_____ ICV CO <sub>2</sub> concentration $\leq \pm 2\%$ of CH <sub>4</sub> certified conc.?					

\_\_\_\_\_ Condensate recovery system leak-checked at  $\leq 10$  mm Hg absolute for 10 min (<2 mm Hg change?)

\_\_\_\_\_ LDS 25 attached and data indicate acceptable performance?

\_\_\_\_\_ Analyst certification attached? *Certification should state that no shutdown of the NMO analytical apparatus of greater than 6 months occurred or no major modifications of the system were made after the performance test date for the NMO analyzer and condensate recovery system.*

LABORATORY DATA SHEET 25a (Continued)

**Condensate Trap Recovery**

- ICV initial pressure  $\leq 10$  mm Hg absolute?
- Auxiliary O<sub>2</sub> flow rate at 150 cc/min?
- If warm up at ambient for 5 min yields CO<sub>2</sub> < 10,000 ppm, aux. O<sub>2</sub> stopped?
- If heating trap to 200°C yields CO<sub>2</sub> > 50,000 ppm, aux O<sub>2</sub> supplied at 150 cc/min?
- Sample recovered from tubing that connected the heated sample box to condensate trap?
- Recovery continued 10 mL syringe samples by NMO analyzer are < 10 ppm CO<sub>2</sub>?
- ICV tank pressurized to 1060 mm Hg?

**Sample Analysis**

ICV Analysis								Sum, C <sub>cm</sub> = ppm CO <sub>2</sub> + ppm NMO			
Sample ID#	Area 1 CO <sub>2</sub> NMO		Area 2 CO <sub>2</sub> NMO		Area 3 CO <sub>2</sub> NMO		Avg.* CO <sub>2</sub> Area	CO <sub>2</sub> Conc., ( ppm C )	Avg.* NMO Area	NMO Conc., (ppm C)	Sum, C <sub>cm</sub> (ppm C)
Blank											

Run #	ICV ID	ICV Vol., V <sub>v</sub> (m <sup>3</sup> )	ICV Final Press., P <sub>f</sub> (mm Hg)	ICV Final Temp, T <sub>f</sub> (K)
1	_____	_____	_____	_____
2	_____	_____	_____	_____
3	_____	_____	_____	_____
Blank	_____	_____	_____	_____

**Condensate Trap CO<sub>2</sub> Purge and Sample Tank Pressurization**

- Sample collected until 10-mL syringe samples analyzed by NMO analyzer are < 5 ppm CO<sub>2</sub>?
- Sample tank pressurized with zero air to a final pressure of about 1060 mm Hg?

**Sample Analysis**

Sample Tank Analysis							
Sample ID#	Tank Final Press., P <sub>tf</sub> (mm Hg)	Tank Final Temp., T <sub>tf</sub> (K)	Area 1	Area 2	Area 3	Avg* Area	Conc., C <sub>tm</sub> (ppm C)
Blank							

\* If more than three injects are used, average all injects.  Sample loop purged with sample before analysis?

**QA/QC Check**

Completeness \_\_\_\_\_ Legibility \_\_\_\_\_ Accuracy \_\_\_\_\_ Specifications \_\_\_\_\_ Reasonableness \_\_\_\_\_

Checked by: \_\_\_\_\_  
Analyst (Signature/Date)

\_\_\_\_\_  
Team Leader (Signature/Date)