TCEQ Experience with Method 18 at Inlet Streams

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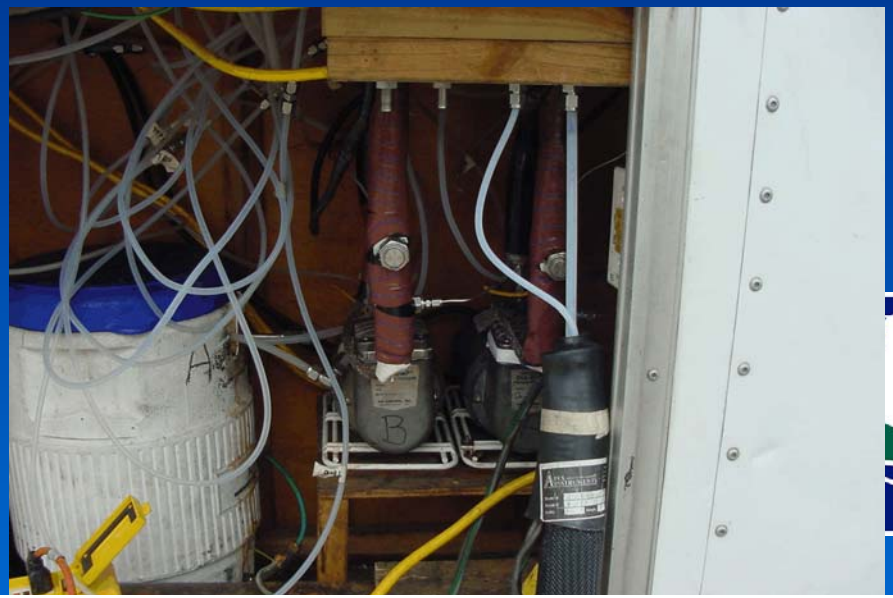
- METHOD 18--MEASUREMENT OF GASEOUS ORGANIC COMPOUND EMISSIONS BY GAS CHROMATOGRAPHY



Method 18 Inlet Testing

JOIN TOGETHER, THE LABORATORY GAS CHROMATOGRAPH AND A TOXIC, CORROSIVE, PRESSURIZED STREAM

APPLICABLE REGULATIONS

- REFERENCE METHODS – 40 CFR 60 APPENDIX A, 40 CFR 63 APP. A
- PERMITS REQUIRE DETERMINATION OF DRE, WHICH NECESSITATES INLET TESTING
- SUBPART NNN, 60.662, 98% DRE OPTION

SAMPLING OPTIONS IN METHOD 18

Bags, gc on site, sorbent tubes

- 8.2.1 Integrated Bag
- *Evacuated Canister/Flask* (flares only)
- 8.2.2 Direct Interface
- 8.2.3 Dilution Interface
- 8.2.4 Adsorption Tube
- 8.2. Condensate trap

WHAT IS DIFFERENT ABOUT INLET STREAMS?

TOXIC, UNDER PRESSURE, WET, HIGH CONC.'S

- High moisture
- High levels of pollutants
- Presence of condensate
- May be at significant positive pressure
- Closer to lines carrying toxic chemicals (valves cn leak)

Method 18 in general. What problems have we seen in TCEQ Region 12?

- Bags in the sunlight
- Improper pump for flow-through bag fill
- Improper sampling location
- No data sheets
- Big pieces of Tygon tubing to connect sorbent tubes
- SUMA Canisters

Sampling an “Empty” Barge

IMPROPER SAMPLING LOCATION

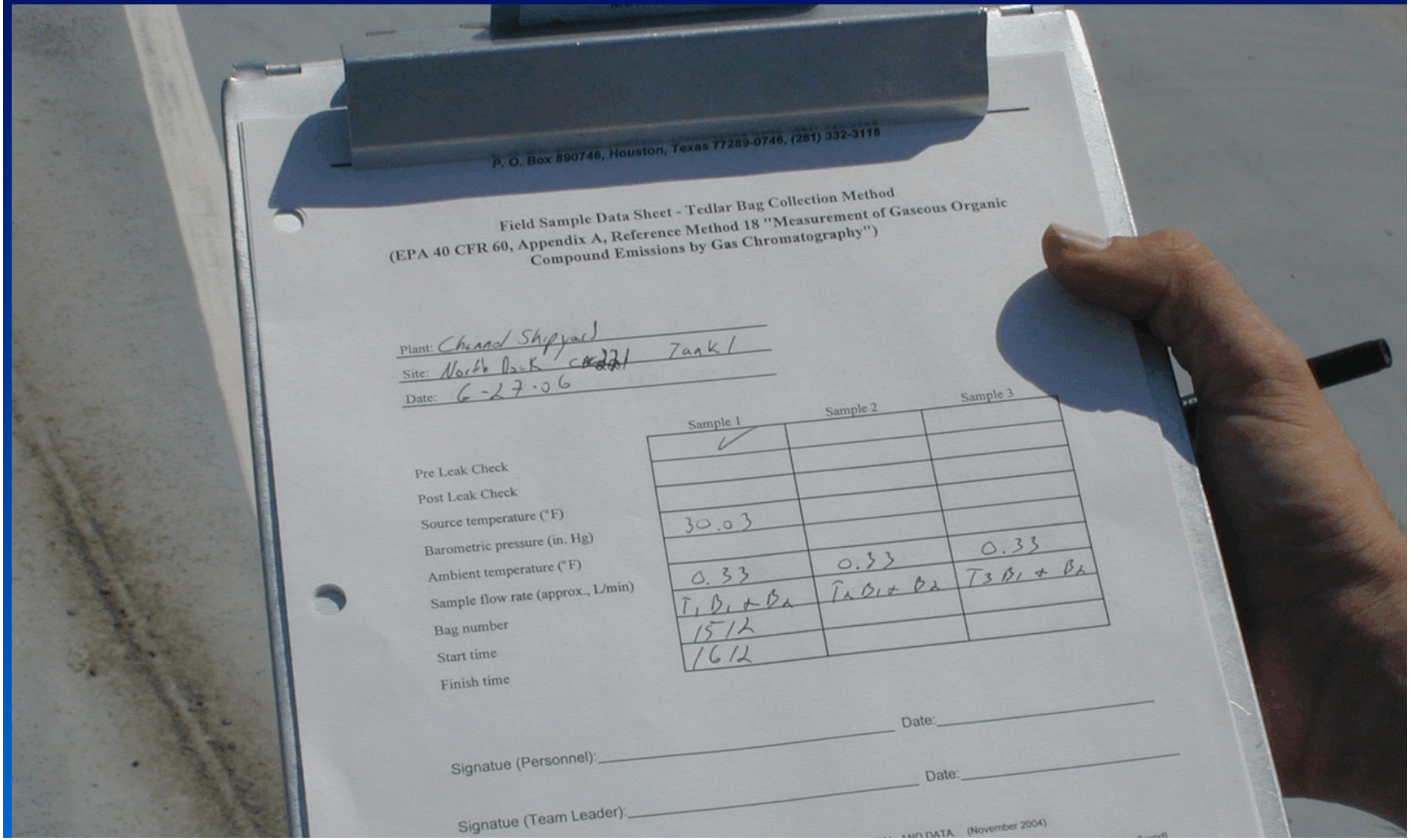
- Is this an acceptable sample tap?
- If used, insert a probe that goes into the main stream
- In this case, a gate valve could be installed; however, the opening is too close to the ground to allow insertion of probe.

PROPER SAMPLING LOCATION AND SETUP

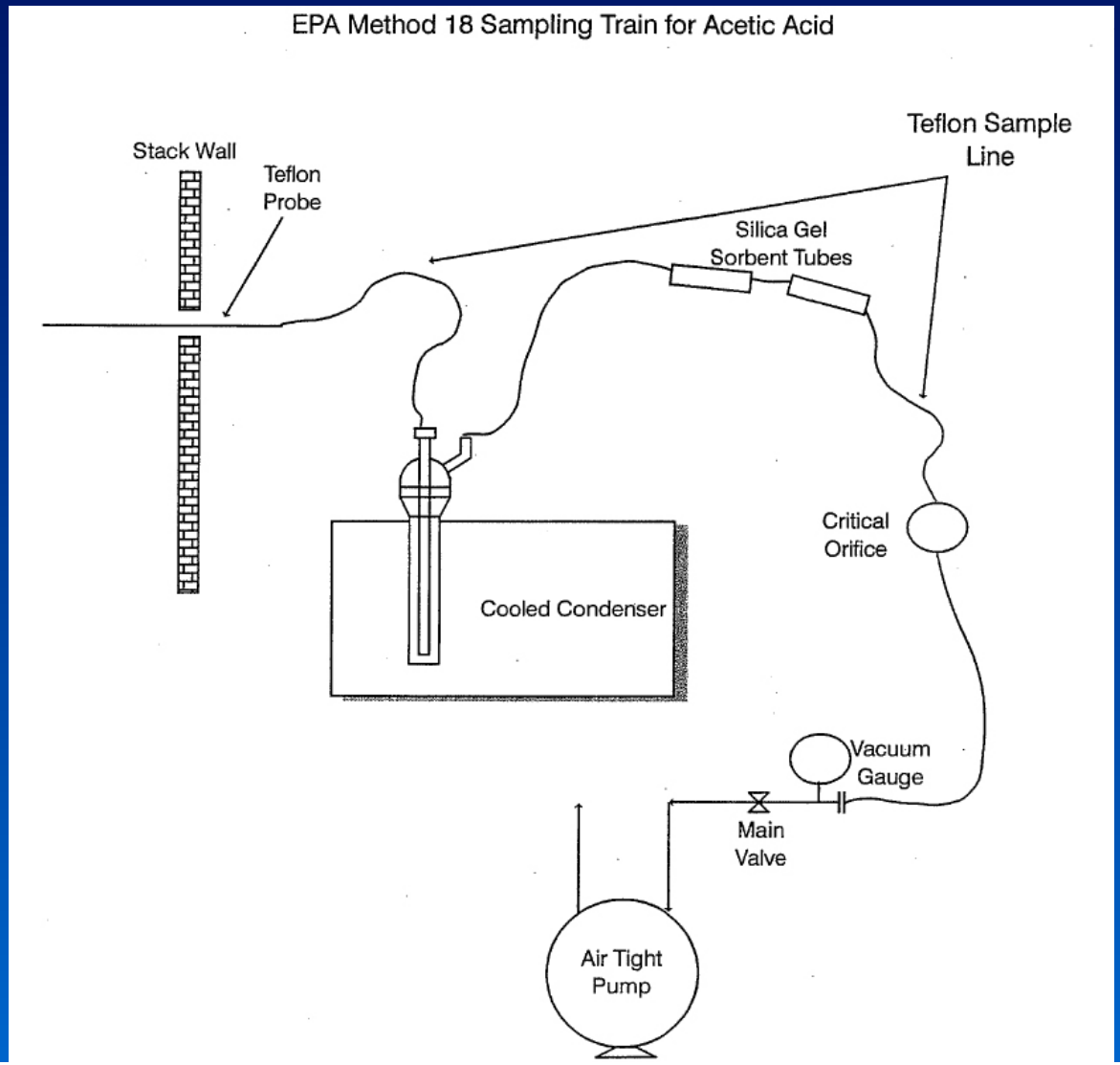
INLET IS WASTE GAS TO A FLARE

SAFETY CONSIDERATIONS

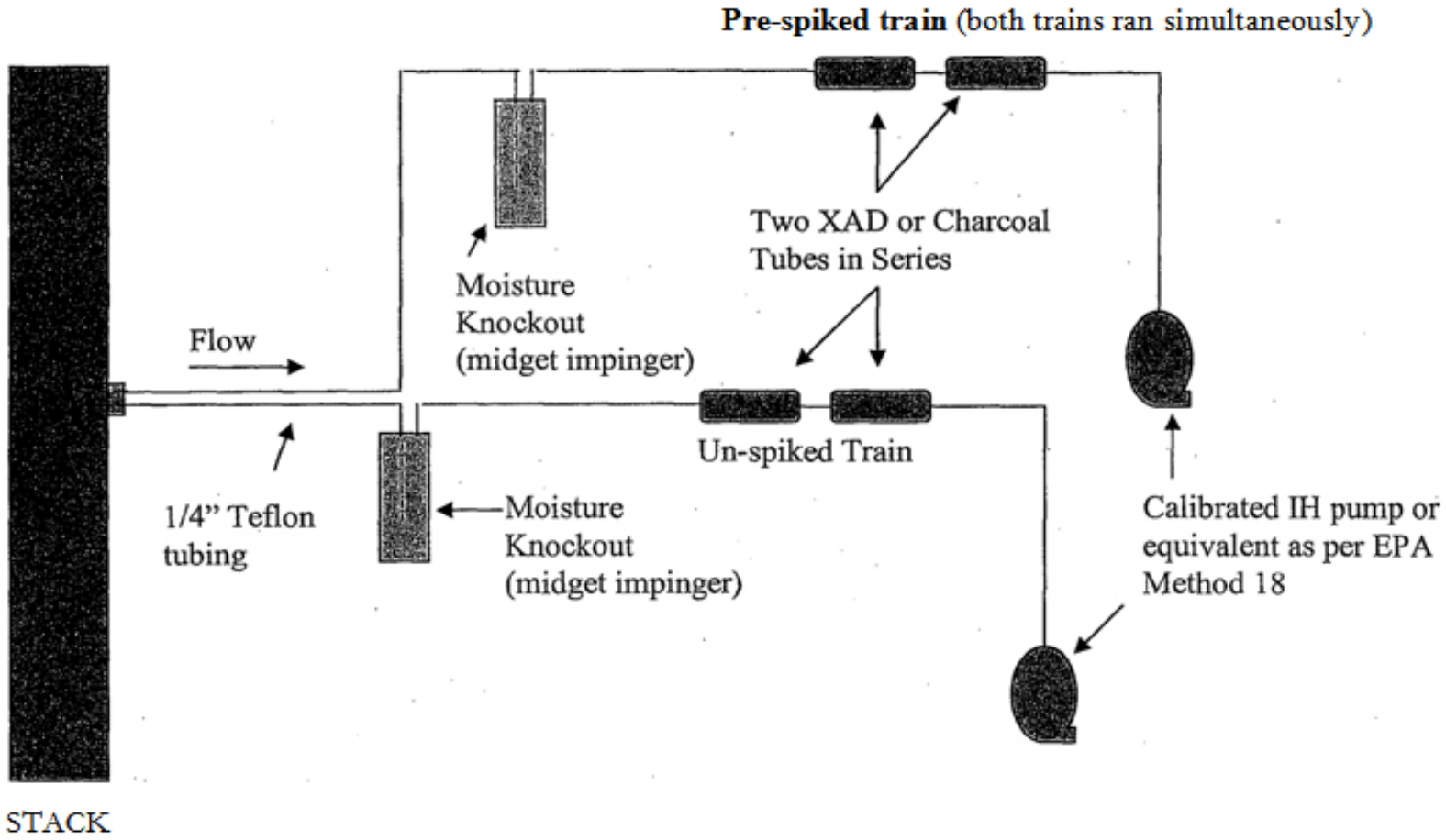
- GATE VALVE ON THE PORT?
- REACTIVE OR TOXIC GAS
- PRESSURE
- ACCESSIBILITY


P. O. Box 890746, Houston, Texas 77289-0746, (281) 332-3118
Field Sample Data Sheet - Tedlar Bag Collection Method
(EPA 40 CFR 60, Appendix A, Reference Method 18 "Measurement of Gaseous Organic Compound Emissions by Gas Chromatography")
Plant: Channel Shipyard
Site: North Bank Tank 1
Date: 6-27-06
Sample 1
Sample 2
Sample 3
Pre Leak Check
Post Leak Check
Source temperature (°F)
30.03
Barometric pressure (in. Hg)
Ambient temperature (°F)
Sample flow rate (approx., L/min)
0.33
0.33
0.33
Bag number
T1 B1 & B2
T2 B1 & B2
T3 B1 & B2
Start time
1512
Finish time
1612
Signatue (Personnel):
Date:
Signatue (Team Leader):
Date:
(November 2004)

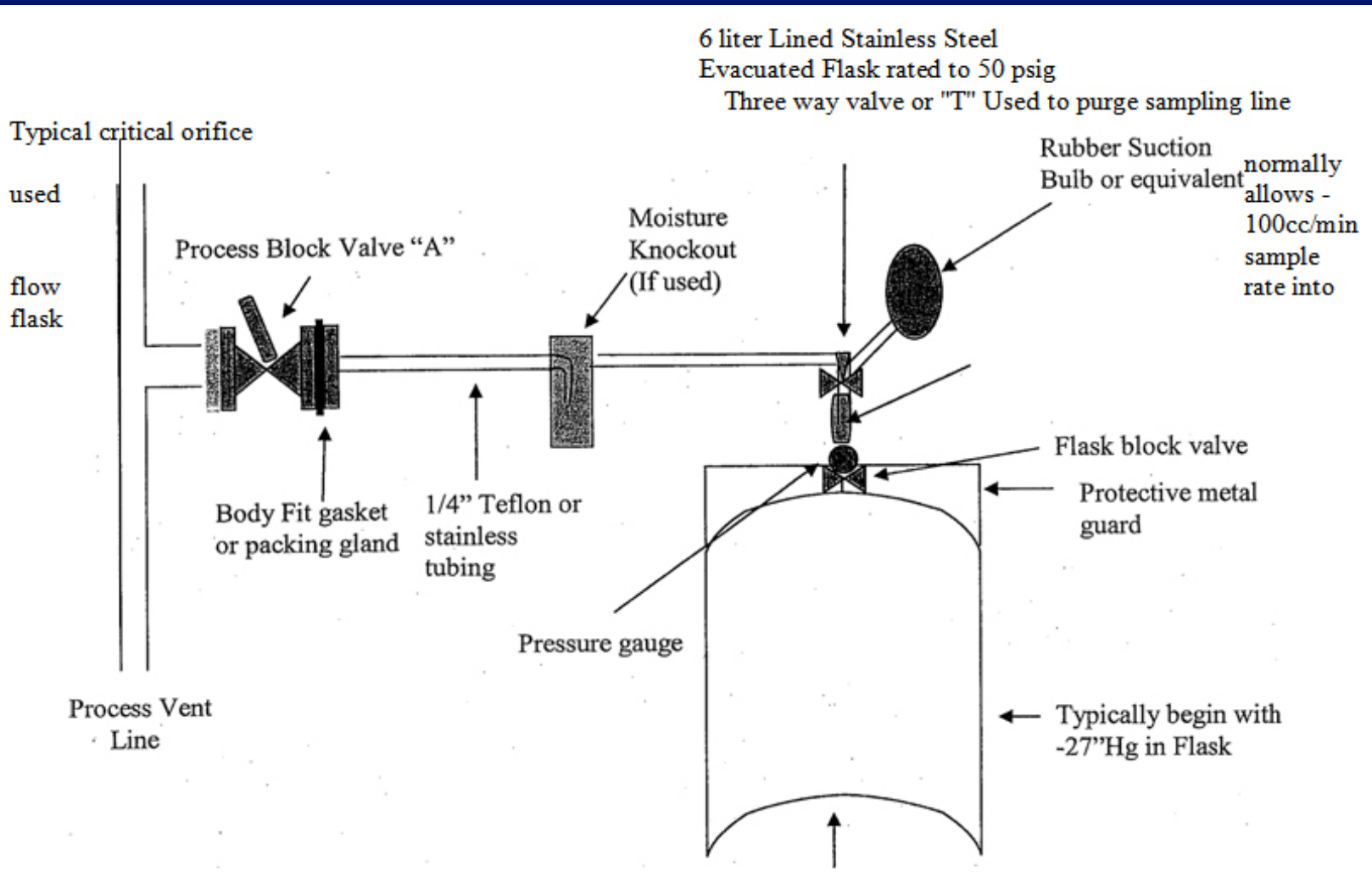
Setup for Sorbent Tube Samples



Sampling Setup for Sorbent Tubes



Connection of SUMA can to Source



Condensate Traps

USED FOR INLETS AND OUTLETS
Dry stream to wet scrubber
Combustion effluent

- SORBENT TUBES--add trap catch to tubes
- BAGS--measure bag volume, calculate mg in bag from ppmv, add trap mg to bag mg
- Recalculate ppmv with combined mg analyte

Example calculation, condensate

Analyte is acrolein, Mol. Wt. = 56.06

- Given: condensate catch = 0.0090 mg
- Vstd = .0078 cubic meters sample volume
- Ppmv = 0.0090/56.06 * 24.0/7.8/1000
- Ppmv = 0.494
- If 9 mg, ppmv = 494

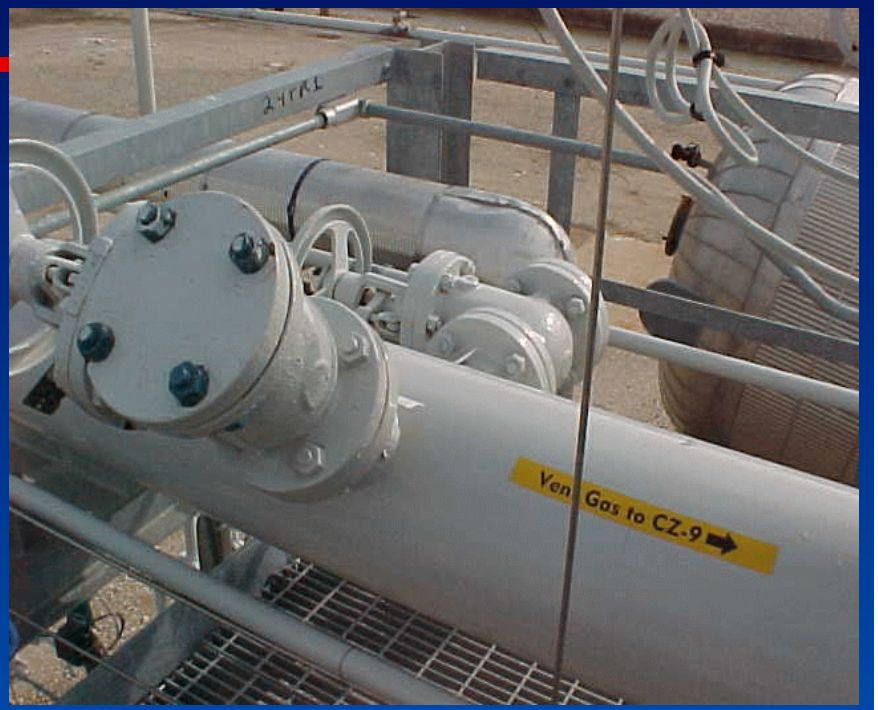
$$ppmv = \frac{1{,}000{,}000}{samplevol.liters}\left(mg.analyte/1000\right)/mol.wt * 24.1.l/mole$$

CONDENSATE TRAPS

ASSUMPTIONS AND PROBLEMS

- Works okay if the VOC dissolves in water
- Some VOC's like to condense on the surface of the trap, tubing, fittings
- What is the protocol for recovering? Solvent? Number of rinses? Analytical technique.
- Phthalate esters.

INLET FLOW RATE MEASUREMENT --OPPORTUNITY TO



- TRY OUT YOUR 45 DEG ANGLE MOISTURE TRAIN
- PRACTICE SKILLS WITH DUCT TAPE--SEAL AROUND PROBE
- USE YOUR NEW CUTTING TORCH TO MAKE ANOTHER PORT
- LEARN HOW TO DETERMINE DIRECTION OF FLOW

SUMMARY OF ISSUES

- NATURE OF INLET STREAMS CREATES TESTING SITUATIONS THAT DO NOT FIT METHOD PROTOCOLS
  - CONDENSATE TRAP--HOW TO RECOVER HYDROPHOBIC COMPOUNDS
  - SAFETY / EXPOSURE ISSUES (TOXICITY, PRESSURE, NEARBY LEAKERS)

SUMMARY

- CALIBRATION STANDARDS FOR DIRECT INTERFACE OPTION--USE SYRINGE/BAG TECHNIQUE?
  - MEASUREMENT OF SAMPLE VOLUME
  - M 18 BAG RECOVERY STUDY REQUIRED?
  - PORT SETUP