MEMORANDUM

To: AIR QUALITY CONSULTANTS

From: John Sliwinski
OSB Lab

Re: Sampling Volumes Guidelines

Date: 15 February 2002

Multisorbent and VOST Tubes

Suggested sampling volumes for sorbent tubes ATD-GC/MSD for a large number of proportionally represented chemicals.

TVOCs		SAMPLING VOLUME (L)		
GC/MSD mg/m^3	**FID ppm (Propane)**	**Range**	**Maximum**	**Split Maximum**
0.5 – 1.0	0.2	20 - 30	50	None – 1:1
5	2	5 - 10	20	None – 1:1
15	6	5 - 10	20	1:3 – 1:4
25	10	5 - 10	10	1:3 – 1:4
100	40	1 - 3	5	1:3 – 1:4
500	200	0.1 – 0.5	1	1 – 1:10

It is difficult to generally predict how a sample concentration chromatographs without prior characterization. A concentration of $25mg/m^3$ of a single peak requires much less volume to prevent saturation than $25mg/m^3$ of 250 peaks that are proportionally represented.

Split ratios greater than 10 are not recommended due to degeneration of method accuracy and losses in overloaded tubes.

Charcoal Tubes

Charcoal tubes are used where concentrations exceed 100mg/m^3 and larger sample volumes need to be taken for representative sampling. Present methods use a CS_2 extraction volume of 2.0mL or 4.0mL and a standard injection of 1µL. The smallest syringe that can be used is 0.5µL range and can deliver 0.05µL with reasonable precision.

TVOCs		SAMPLING VOLUME (L)		
GC/MSD mg/m^3	**FID ppm (Propane)**	**Range**	**Maximum**	**µL (4000 Dilution)**
100	50 - 300	50 - 200	200	1
500	250 - 1500	30 - 100	200	0.5 - 1
1000	500 - 3000	30 - 50	100	0.5 – 1
2000	1000 - 6000	10 - 30	50	0.5 - 1
5000	2500 - 15000	5 - 30	50	0.5 – 1
10000	5000 - 30000	5 - 10	20	0.5 - 1

Gas Bags

Gases with high concentrations can be sampled with Tedlar bags where routine injections range 0.01mL to 300mL. The net concentration analyzed overlaps with the charcoal method but permits determination of low boiling fractions lost in the CS_2 method. High boiling organics tend to be lost (deposited) in gas bags. Larger volumes are not usually sub-sampled due to artifacts NNDMA and Phenol leaching from bags and producing large peaks.