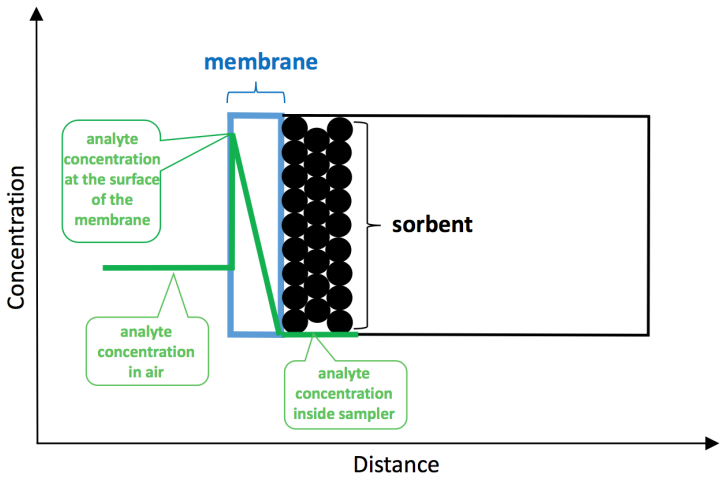
Environmental Division

AGAT Laboratories

The Waterloo Membrane Sampler™

AGAT Laboratories in partnership with SiREM, is pleased to announce that the Waterloo Membrane Sampler™ (WMS) is now available for passive soil vapour sampling exclusively at AGAT.

The Waterloo Membrane Sampler™ (WMS) is a cost-effective, simple-to-use passive sampler for soil vapour. The WMS provides quantitative concentration measurements with similar accuracy and precision to conventional active soil vapour samples collected using Summa canisters or TD Tubes.



The WMS is a permeation-type passive sampler. When it is exposed, the VOCs permeate through the membrane covering the top of the sampler vial, driven by a concentration gradient. The sorbent inside the sampler then traps the vapours and then the mass of each compound is determined by GC/MS at AGAT Laboratories.

Simpler sampling protocols for less training and less risk of inter-operator error.

- Smaller size for ease of shipping and handling.
- Minimizes sampling variability.
- Broad range of compounds.
- No pumps, mechanical parts, connections or calibrations.
- Time-integrated sampling.
- Quantitative results.
- More cost-effective than active sampling.

Pictured right: WMS suspended in a soil vapour holder.

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Frequently Asked Questions (FAQ)

- **Is the use of the WMS accepted by the Ministry?**

  - Under “Regulation 153 Vapour Intrusion Guidelines,” the WMS is accepted as an alternative sampling media for the collection of soil and sub-slab vapour. There is no prescribed sampling method that is recommended or preferred over another. It is the responsibility of the QP to determine what sampling media would be best for their site.

- **Can I use the WMS sampler for an RSC?**

  - Yes, as the WMS is an accepted sampling media, it can be used for soil vapour and sub-slab samples. A canister may still be needed for indoor air confirmation of vapour intrusion.

- **How does the WMS work?**

  - Passive samplers can be classified into two general types based on how the VOC uptake is controlled: **(1)** those that rely on diffusion through a stagnant air region (passive diffusion samplers) and; **(2)** those that rely on permeation through a nonporous membrane (passive permeation samplers).
    In the latter, VOCs permeate through the uptake-rate limiting membrane before they are collected by the sorbent.
    The Waterloo Membrane Sampler™ is a permeation-type passive sampler. When it is exposed to air, VOCs in the air permeate through the membrane covering the top of the sampler vial, driven by a concentration gradient. The sorbent inside the sampler then traps the vapours.

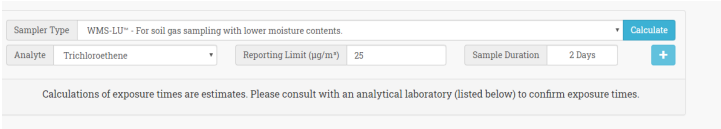
- **Is the WMS impacted by environmental changes?**

  - Unlike other media, the WMS has minimal effect from moisture, wind velocity, or barometric pressure.
    The hydrophobic nature of the membrane excludes water and also prevents turbulent uptake so the sampler can be deployed in high velocity environments such as soil gas extraction systems.

- **How long does the WMS have to be deployed?**

  - The WMS can be deployed for a minimum of a few days to up to 30 days. You can calculate deployment times by using the Sample Duration Calculator to determine what WMS will work best for your site.

    www.siremlab.com/pages/wms#calculator



- **Why are there different types of WMS samplers?**

  - Each WMS is designed to work in different types of soil.

  - The WMS-LUTM is a low-uptake WMS, used for vapour concentrations in soil gas. The lower uptake rates mitigate the effect of the sampler starvation that may occur when collecting soil gas, and will allow for quantitative soil gas sampling in drier subsurface conditions.

  - The WMS-TMTM is designed for VOC vapour concentrations in soil gas with low permeability or very wet soils.

- **What is the hold time for the WMS?**

  - Once a sample has been taken, the hold time is 14 days.

  - Samplers should be kept cool (ice packs but NO ICE is recommend, for these types of samples should not get wet) and shipped back to the lab. Target temperature is 10°C.

How does the WMS compare with more traditional sampling media?

	Residential	Attenuation Factor	WMS	Canister	TD tubes
	Guideline limits	**500X**			
Sampling Times			5 -30 day deployment	10-60 minutes	30 minutes / 3L
Field Time - setup not including sampling time			10-15 minutes	45-60 minutes	45-60 minutes
			Detection limits	Detection limits	Detection limits
	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
Benzene	0.51	253	132	1	4
Carbon Tetrachloride	0.42	209	163	2	2
Chlorobenzene	209	104500	238	1	150
1,4 Dichlorobenzene	0.28	139	114	2.5	2500
1,1 Dichloroethane	0.34	172	93	1.2	1500
1.2 Dichloroethane	0.04	21	63	1.3	1.5
Ethyl benzene	201	100500	198	0.9	5
Hexachlorobutadiene	0.05	25	21	5	1
Hexane	521	260500	556	1.1	15
Naphthalene	0.77	386	53	5	2.5
Styrene	54.20	27100	219	1	5
Tetrachloroethane 1,1,2,2	0.02	10	32	1.5	2.5
Tetrachloroethylene	52.10	26050	32	1	1.5
Toluene	1040	520000	278	10	10
1,1,2-Trichloroethane	0.07	35	160	1.5	0.5
Trichloroethylene	0.56	278	160	1	2.5
Vinyl Chloride	0.13	63	116	0.4	1
F1 (C6-C10)	621	310500	15	15	20
F2 (C10-C16)	107	53500	15	15	20

Requires Purging / Leak Test			NO	YES	YES
Impacted by Moisture			NO	YES	YES
Humidity / Weather			NO	YES	YES
Indoor Air			NO	YES	YES
Additional Equipment Required			NO	YES	YES

Average attenuation factor for soil vapour is between 100-1000x

For any other questions or help with determining what WMS will work best for you, please contact:

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