



SewAus

Census

Victoria, New South Wales, South Australia, Queensland, Tasmania, Biomarkers, Effluent, Sewage, Diet, Pesticides, Environment, Population Health, Pharmaceuticals, Western Australia, Biosolids, Influent, Wastewater, Spatial Analysis, Exposure, Northern Territory, Australian Capital Territory



SewAus Census 2021

Estimating per capita use and release of chemicals by wastewater analysis

Aims: We aim to assess human use and exposure to chemicals including drugs, pharmaceuticals, lifestyle chemicals, and unintentional exposure to environmental pollutants in the Australian population through the systematic collection and analysis of wastewater. After the success of the SewAus Census 2016 project, we aim to conduct longitudinal sampling on each anniversary of the Census. We aim to provide accurate and objective per-capita based consumption and release estimates for a wide range of chemicals and how these are changing over time.

Key sampling objectives:

- Sampling is planned for the 2021 Census day (Tuesday 10th August 2021) at WWTPs across the whole of Australia
- Where possible, we would like to collect daily influent and effluent samples, as well as a biosolid sample

Sampling:

Influent and effluent samples:

- 7 x 24 hour integrated samples on consecutive days
- Ideally we want high-frequency flow-proportional samples. If not, high-frequency time-proportional samples. We will ask operators to optimise on-site autosamplers
- If weekends are problematic, we will aim for a composite sample covering Saturday and Sunday
- From each daily integrated influent and effluent sample, three subsamples of each to be taken. The acid and preservative provided should be added to the subsamples labelled as: Acidified (■), Preserved (■)
- Sites without autosamplers will be provided with passive samplers as will some sites with autosamplers to further calibrate the passive samplers

Biosolids:

- 1 x Composite sample of 2 or more subsamples

Sample handling - samples to be frozen and couriered to QAEHS in one delivery post sampling (all supplied)

Sample collection days

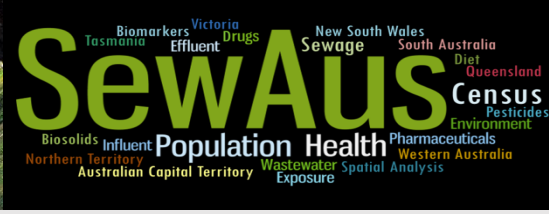
- Preference for samples to be collected for 7 consecutive days to include the night of Tuesday (1st August) (five options – see table below)

Thursday, 5 August 2021	Friday, 6 August 2021	Saturday, 7 August 2021	Sunday, 8 August 2021	Monday, 9 August 2021	Tuesday, 10 August 2021	Wednesday, 11 August 2021	Thursday, 12 August 2021	Friday, 13 August 2021	Saturday, 14 August 2021	Sunday, 15 August 2021
1	2	3	4	5	6	7				
	1	2	3	4	5	6	7			
		1	2	3	4	5	6	7		
			1	2	3	4	5	6	7	
				1	2	3	4	5	6	7

Important information



- We will supply collection bottles, passive samplers, labels, eskies, preservative/acid and pre-paid courier slips
- All WWTPs will be contacted individually prior to sampling to discuss requirements for that site. Site-specific sampling instructions will be provided with the packs sent out in the last week of July
- We will ask for a questionnaire to be completed during/after sampling. A “help-desk” will be available for the sampling period to answer queries and to help with completing the questionnaire. All results continue to be de-identified to maintain WWTP confidentiality and will be provided back to WWTPs.

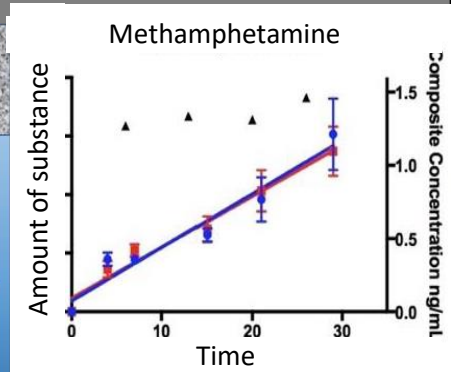
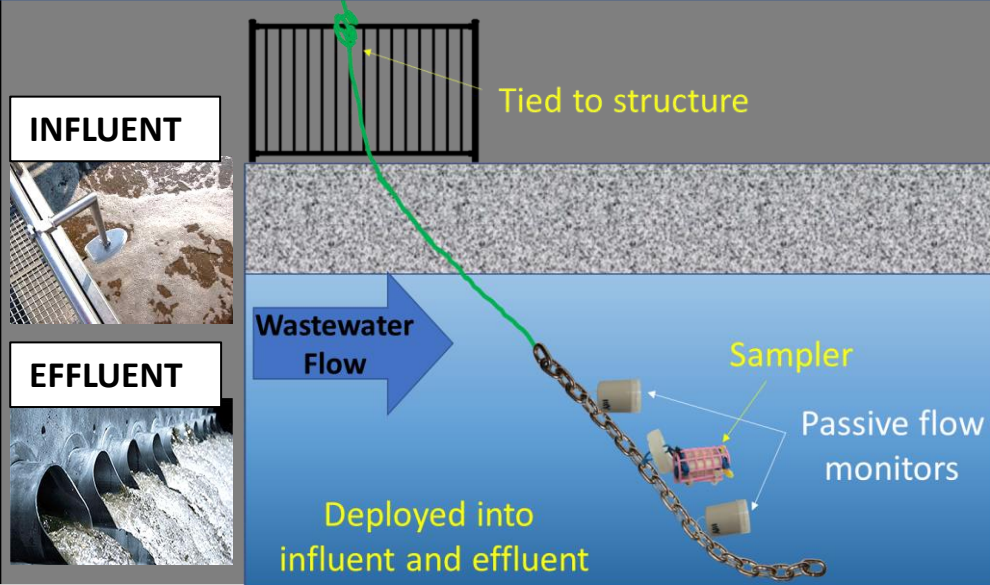


Passive sampler tubes in deployment mesh

Passive Samplers: What are they?

- Passive samplers are small tubes filled with a substance that *passively accumulates chemicals over time*
- We can submerge these in influent or effluent over several days/weeks to determine presence and concentration of chemicals such as pesticides, pharmaceuticals and drugs
- Passive samplers can be easily deployed to obtain data at sites where Autosamplers are not available/possible

Estimating chemicals using passive samplers – deployment and results



Expected results – accumulation of substance over time

Why Passive Samplers?

- Simple design consists of ready to deploy rope and chain, requiring no power
- Simple deployment: tie rope to structure, remove caps, submerge samplers into wastewater influent or effluent streams, leave for 1 week. Remove from wastewater, recap and send back.

Research:

- *This project aims to provide research data to help develop these tools*
- *Our goal is to be able to use these devices in locations where power or resources preclude the use of active composite sampling*