



Sample Temperatures

How many samples are received by the lab cold? The answer may surprise you

“Samples should be sealed and transported to the laboratory as soon as practicable, using suitable cooling aids (preferably ice bricks or in a refrigerated container) to ensure samples start cooling as soon as possible, and they should be stored in a refrigerator ($\leq 6^{\circ}\text{C}$) until analysis.”

NEPM B3 no longer requires samples to be received at the Laboratory at 4°C as long as the client has attempted to cool their samples below ambient.

Temperature control of water samples during delivery to the lab

There is a general conception that sample temperatures must be at 4°C .

Envirolab Group recently in January 2016 tested this common theory that water samples need to be kept cold at 4°C .

The team firstly took the surface temperature of 104 samples in bottles and jars typically received in eskies at our Envirolab Sydney lab.

As a note, these eskies were from local Sydney clients generally delivered to the lab the same day as sampling. The samples had been placed in the eskies with a mix of both ice and ice bricks.



How many samples are received cold by the lab?

The table below lists the temperature range of the 104 samples. From the table, 31% were received at $< 5^{\circ}\text{C}$. 28% of eskies were received at $5-10^{\circ}\text{C}$, 26% at $10-15^{\circ}\text{C}$ and 15% of eskies were $> 15^{\circ}\text{C}$.

So to put those figures another way, **69% of eskies were received at > 5 degrees.**

$< 5^{\circ}\text{C}$	$< 5^{\circ}\text{C}$	$5-10^{\circ}\text{C}$	$5-10^{\circ}\text{C}$	$10-15^{\circ}\text{C}$	$10-15^{\circ}\text{C}$	$> 15^{\circ}\text{C}$	$> 15^{\circ}\text{C}$
Ice	Ice Pack	Ice	Ice Pack	Ice	Ice Pack	Ice	Ice Pack
16%	15%	15%	13%	13%	13%	3%	12%

Is this a problem?

For distilled water samples in a VOC Vial with no headspace, it doesn't seem to be a problem. The table below summarizes an additional experiment conducted in February 2016 at Envirolab. Water VOC Vials were spiked with 20ppb VOC's and stored over several hours at either 8 °C, 21 °C or 40 °C. These VOC Vials were then analysed.

As can be seen from the list below of selected VOC's, there is no significant difference in results across all three temperature ranges.

	40 °C	21 °C	8 °C
	% Recovery	% Recovery	% Recovery
DICHLORODIFLUOROMETHANE	114	110	111
CHLOROMETHANE	103	99	104
VINYL CHLORIDE	103	102	101
CHLOROETHANE	99	98	96
TRICHLOROFLUOROMETHANE	116	112	113
1,1-DICHLOROETHENE	99	98	96
TRANS-1,2-DICHLOROETHENE	100	99	98
MTBE	100	99	96
CHLOROFORM	100	100	98
1,1,1-TRICHLOROETHANE	99	99	97
1,1-DICHLOROPROPENE	99	98	96
CARBON TETRACHLORIDE	97	98	96
BENZENE	100	100	98
DIBROMOMETHANE	100	99	97
1,2-DICHLOROPROPANE	99	99	97
TRICHLOROETHENE	122	92	83
BROMODICHLOROMETHANE	97	98	95
1,1,2-TRICHLOROETHANE	100	100	97
TOLUENE	101	100	97
TETRACHLOROETHENE	103	100	97
1,1,1,2-TETRACHLOROETHANE	100	99	96
CHLOROBENZENE	102	101	98
ETHYL BENZENE	103	101	98
BROMOFORM	98	95	92
STYRENE	100	98	95
O-XYLENE	102	100	97
2-CHLOROTOLUENE	104	99	95
4-CHLOROTOLUENE	104	99	96
1,3,5-TRIMETHYLBENZENE	106	99	96
1,2,4-TRICHLOROBENZENE	112	96	94
NAPHTHALENE	113	97	92
HEXACHLOROBUTADIENE	106	100	102

Conclusion

A headspace free VOC vial of distilled water will not suffer from volatile losses in a warm esky up to 40 °C. However, samples with headspace, for instance a poorly packed soil jar, may not have the same outcome.

Where to from here?

At a later date, our team will expand this experiment to a combination of real ground/surface/waste water and soils.

For further information on this test or sending a water sample for testing call **1300 424 344** or email **David Springer**: dspringer@envirolab.com.au