

## Keeping Water Samples before BART testing

*Quick Break Training*

12 March 2009

When your out in the field collecting water samples for BART testing and you do not want to start the BART tests until you get back to the office, the challenge arises as to how you keep the water samples until you get back to a place when you can do the testing. Obviously keeping the water samples for longer than a day creates problems since the bacteria in the water sample will change in their activity levels and dominant communities over time. There can be no doubt that changes will occur in bacterial activity but to level the “playing” field all of the samples should go through a common protocol in which the storage time is reasonably consistent. It is well known that most bacteria go into a dormant state when temperatures are reduced below 7°C. This can be done by placing the water samples into a refrigerated environment (4±2 °C) using a small portable refrigerator. Make sure that the sample bottles are not packed in too tightly since packed or stacked bottles can cause greater variations in temperature between samples. Depending upon the original temperature of the water, there would be different degrees of impact on the bacterial activity in the sample. However at storage temperatures of 4±2 °C, most bacteria become much less active. This means that the samples can be stored for longer (generally up to three weeks) before some of these bacteria become active again. Whether the sample has been kept for one day or as long as three weeks then they would all have been reduced to a common level of inactivity (static state). Thus comparisons cannot be made between samples stored for only one day with those stored for as long as three weeks.

In setting up the BART testers using these samples it is very important to have allowed the water samples to have returned to room temperature. To do this put the sample bottles out on a bench without stacking them or pushing them together. There needs to be a good flow of air around each bottle to ensure that all of the water samples have come up to room temperature (22±2 °C) before beginning the BART testing. Of course all of the water samples would be impacted by a cooling and then warming cycle which would affect the levels of bacterial activity but hopefully in a relatively common manner. It may be expected that the time lapses would normally have lengthened due to the additional time that the bacteria have now taken to adapt. While reactions may not be affected by the prolonged storage it could be expected that the time lapse (and hence the prediction of the pac/ml) would have lengthened with smaller predicted populations. However these data can be used comparatively for the various samples subjected to the same storage regimen.

Bottom line is that you can store water samples in a refrigerator for as long as three weeks and you will be able to conduct BART tests for the major bacterial communities. Bare in mind that the bacteria would be affected and some might actually thrive at these low temperatures while others in time will flourish. That is the reason for putting a three week upper limit on refrigerated. Also if the water sample is from a very cold source (e.g. 8±4 °C) then these bacteria might adapt quickly and dominate when the testing is done at room temperature.

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