Instructions for sampling

The sample should be collected from the surface down to about 1 dm from the bottom. If the bottom is solid and the sampling is made from a stationary point, for instance a bridge, a mark should be put on the wire of the winch for desired depth. If the depth is not constant, i.e. if sampling is made from a boat or if the bed varies, the depth must be sounded before each sampling. Within the first two decimeters below the surface the sampler must be lowered especially slowly in order to get a smooth inflow. Thereafter the sampler should be lowered at a uniform rate and raised back to the surface at a uniform rate, but not necessarily at the same rate.[1] If the volume of the sample is less than 500 mL after one round-trip integration another one may be made, but this time at a higher transit rate, to get additional water with a total volume still less than 800 mL.

The minimum transit rate is determined by sampling depth and stream velocity. To avoid flow through the container and simultaneous sedimentation the desirable maximum volume of the sample is 800 mL but may rise to about 950 mL without outflow through the exhaust tube of the container.

The table below shows in round numbers the maximum transit rates at different mean velocities. The sampling time is calculated on a volume of 800 mL and has been adjusted for the characteristics of the intake. Corresponding sampling depth is given in column 4 and the maximum sampling depth is calculated for a volume of 950 mL.

Average stream velocity (cm/s)	Sampling time (s)[2]	Max sampler transit rate (cm/s)	Max sampling depth for 800 mL (m)	Max sampling depth for 950 mL (m)
20	140	8	5.5	6.3
30	100	12	6	7
40	80	16	6.4	7.5
50	65	20	6.5	7.7
60	55	24	6.7	7.8
70	50	28	7	8.4
80	45	32	7.1	8.5
90	40	36	7.2	8.4 8.5
100	37	40	7.2	8.4 8.5

Spare nozzles, and preferably a complete set of tubes, should be kept in the field. If the nozzle of the tube is deformed, the characteristics of the intake will be altered. To avoid ice forming in the tubes during the frozen period the tubes should be kept at room temperature before use.

Reference

Nilsson, B., 1969: Development of a depth-integrating water sampler. *UNGI Rapport* 2, 17 pp. Uppsala University, Department of Physical Geography, ISSN 0375-8109.

[1] You may have learned a rule that the sampler must be moved at a steady pace downwards and then at the same pace up again. That is an operating procedure used by US government agencies, and not something dictated by the sampler or the sampling method. What matters for depth-integrating sampling is only that the transit rate is constant when going down, and constant when going up, but the two velocities can be different. Note, however, that it is important not to make any stop at the lowest point. The sampler must go directly from a downward to an upward motion (as immediately as is physically possible).

[2] Use sampling time to calculate transit rate as follows: Transit distance = 2 * (depth - 10 cm). Transit rate = transit distance / sampling time. Never exceed max sampler transit rate (which incidentally equals stream velocity divided by 2.5).