Environmental Services

AGAT Laboratories

Instructions for Collection and Submitting Samples for Testing

Representative Samples

A representative sample is one that reflects the same characteristics as, and can be considered an accurate subset of the material being measured. Representative samples taken in a similar manner at the same time and location have an equal probability of yielding the same result. Sample collection techniques are outside of the scope of the laboratory however, the sampler must be cognisant of the conditions that the material sampled represents. Sampling points must be selected to address the intent of monitoring outlined in the Regulations. The choice of sample type (i.e., grab samples, composite samples or continuous in-line sampling) will depend on certain characteristics such as average, maximum or minimum concentrations of a contaminant. As well, the sample type selected must be fit for purpose so that the data gathered meets the monitoring objectives. For more information the reader is recommended to review documents such as MOE's Practices for the Collection and Handling of Drinking Water Samples, Ver.2, April 2009, and other practices recommended by EPA, MOE, the Ontario Clean Water Agency and other leading jurisdictions.

Sample Containers

Certain tests have specific volume and container-cleaning requirements. Microbiology tests require sterile containers and many organic tests require 1-litre sample volumes. Sampling containers are provided by AGAT Laboratories and are listed by parameter type on the back of AGAT's Chain of Custody form. Minimum volumes are specified as well.

Sample Collection

The collection and handling of samples is crucial to obtaining valid data. Disposable gloves may be worn and care must be taken that the inside of the container and cap do not come into contact with anything other than the atmosphere. If the inside of the sampling container is touched, it must be considered contaminated and should not be used. While the sample is being taken, the exterior of the cap should be held in the sampler's fingertips.

The collection of drinking water grab samples is generally done from taps located at the sampling points. Sampling taps should be free of aerators, except when sampling drinking water for lead testing where aerators are to be left on, hose attachments, strainers and mixing type faucets. The best method for collecting a grab sample is to collect the sample directly into the container provided by the laboratory. This eliminates the potential for sample contamination through the use of an intermediate container.

In the case of sampling for microbiological testing, phenols, sulphide, volatile organic compounds, hydrocarbons, and oil and grease (not regulated), the sample must always be collected directly into the laboratory sample container. Some sample containers are pre-charged with preservative; field personnel must not rinse these containers prior to sample collection. Also, sample containers for organic compound analysis should never be rinsed with the sample, as the organic compounds from the rinse may accumulate on the container walls and compromise the accuracy of the analytical results. Sample containers should be filled slowly to prevent overflowing when containers have been pre-charged with preservative, and to eliminate bubble formation.

Sample Filtering

Drinking water samples shall not be filtered in the field prior to analysis. As it is not expected that the consumer filters their water prior to drinking it, unfiltered samples will provide a more representative sample of what the consumer is drinking. Unfiltered samples for the measurement of organic compounds and microbiological parameters are very important because many organic compounds adsorb to the particulate present in a water sample and membrane filtering will remove bacteria from the sample.

Sample Preservation

Preservation may be required to stabilize the analyte of interest in the sample prior to its transportation to the laboratory. The main types of preservation for drinking water samples are refrigeration and pH control. Containers that have been pre-charged with preservative should not be rinsed or allowed to overflow or the preservative will be diluted.

Sample Holding Times

For certain tests, the sample must be received at the laboratory and analyzed within a short period of time. Examples of perishable parameters include turbidity, microbiological contaminants, volatile organic compounds and N-nitrosodimethylamine (NDMA). Laboratory method holding times for parameters are listed on the back page of the AGAT Laboratories Drinking Water Chain of Custody. Holding time is defined as the time between the collection of the sample and the start of analysis. **Note:** For lead testing unpreserved drinking water samples must be preserved at the lab within 14 days from date of collection.

Sample Labelling

Accurate and complete labelling of samples ensures that the sample's identity is maintained. This is very important for sample tracking and data interpretation and is mandatory for sample data reporting and adverse water quality notification requirements under the Regulations. It is advisable to pre-label all sample containers prior to taking the sample or to label each container immediately after the sample is taken to prevent confusion. An indelible (permanent) marker or pen should be used and the material from which the label is comprised should be able to withstand water. AGAT Laboratories Ltd. will supply the sampling container. Sample containers will have labels affixed to the container itself and it will list information regarding which test(s) is analysed from the container and the preservative, if any, pre-charged into the bottle.

The sample ID generated should be simple and unique to the sampling set/batch collected.

Sample Storage and Transportation

It is recommended that all samples be delivered to the laboratory as soon as possible after sampling. Samples should be kept cool (refrigerated) if immediate shipping is not possible. Samples should be packaged using the packing materials provided by AGAT Laboratories to avoid breakage during shipping. Samples must be shipped to arrive at the branch/laboratory before the holding time for the samples has expired. Note: Samples delivered to a branch location need to arrive with sufficient time to enable delivery to the laboratory in order to meet the test hold times as indicated on the back page of the COC.

Samples for microbiological testing should be packed with ice packs or a suitable leak-proof container of ice and shipped in insulated boxes/coolers. Loose ice must be encased in waterproof packaging or a sealed container to avoid possible contamination of the sample. If possible, the sample should be chilled to below 10°C, but not frozen, prior to packing. Optimal temperatures conditions during transport are less than 10°C.

The chain-of-custody record must be included in the shipping cooler. A written record of how the samples are shipped, the time, date, carrier and tracking numbers for the shipments should be kept by the sampler.

Chain-of-Custody (COC)

As previously mentioned, proper sample labelling is crucial to maintaining the identity of a sample. However, additional measures are then required to ensure a sample is traceable from the time of collection through to its analysis. These steps are referred to as a chain-of-custody and are used to ensure the integrity of the sample and resulting data. A chain-of-custody form provides an accurate written record that can be used to trace the possession, transfer and custody of a sample from the time of its collection through to its introduction into the analytical data set. As illustrated in the attached example of a completed Drinking Water Chain of Custody (COC) all information must be documented to ensure that samples can be processed immediately for lab testing. An incomplete COC can result in delays while the missing information is ascertained from the sender.

Each person involved in the chain of possession must sign the custody form when a sample or set of samples is received or relinquished. In the case of drinking water samples, an AGAT Drinking Water chain-of-custody form must accompany samples to the point of receipt by the laboratory. The intent of this form is to document the transfer of custody

of the samples from the sample custodian (sampler) to any other person and to the laboratory. If common carriers are used, receipts should be kept and, if packages are mailed, they should be registered and return receipts requested. These should be kept as part of the chain-of-custody documentation.

For lead testing each fixture needs to have its own unique identifier, e.g., "T001" for tap number one. This identifier should be used on the sample bottle and chain of custody form. When completing the chain of custody form, include the unique identifier in the form's description or location field, and whether the fixture is a tap or fountain, if a filter is used, and the location.

E.g., T001-tap-filter-kitchen, or F002-fountain-2nd floor/ northwest wing.

Once the samples have arrived at the laboratory, the chain-of-custody form will be signed off by an authorized person at the laboratory receiving the samples. Any samples that arrive in a condition unsuitable for analysis (e.g., broken, improperly preserved) will be documented and the client contacted for further directions on how they wish to proceed. This includes checking sampling dates recorded on containers or on COC to make certain that holding times for the tests requested have not been exceeded. Clients will be notified of samples that cannot be analyzed so that a second sample can be collected.

Sample Delivery to Branches

Samples can be submitted to any AGAT Branch/Depot through common couriers or by direct drop-off in person between the hours of operation indicated in the table above. Samples must be received by an AGAT staff on duty during normal office hours.

Relative to sample holding times it is essential that samples are received as quickly as possible after collection to ensure that samples can be delivered to the analytical lab in time to meet specified parameter hold times. If delivery of samples will occur late in the day on Fridays the Branch should be contacted in advance to enable staff to be able to make arrangements with common couriers or AGAT drivers to have samples picked up before closing time and rerouted to our main lab.

Field Quality Control Samples

EQUIPMENT RINSATE: A sample of analyte-free media which has been used to rinse the sampling equipment. It is collected after completion of decontamination and prior to sampling. This blank is useful in documenting adequate decontamination of sampling equipment.

TRIP BLANK: A sample of analyte-free media taken from the laboratory to the sampling site and returned to the laboratory unopened. A trip blank is used to document contamination attributable to shipping and field handling procedures. This type of blank is useful in documenting contamination of volatile organics samples.

FIELD or TRAVEL BLANK: Are defined as matrices that have negligible or unmeasurable amounts of the substance of interest. They are prepared by transferring the analyte free media from one vessel to another or by exposing the media to the sampling environment at the sampling site.
TRIP SPIKE: is a sample of uncontaminated reagent water free of any interfering substances to which a known amount of standard solution and appropriate preservative have been added by the laboratory performing the analysis. The trip spiked blank must be prepared within 24 hours of accompanying the sample containers to the sampling location. The travelling spiked blank is brought to the field and returned, unopened, to the same laboratory for analysis. The trip spiked blank must be spiked with solutions containing all the target parameters required to be analyzed.

A travelling spiked blank sample should provide an indication of the degree of degradation of the target parameters from the time of sampling to analysis.

Ontario Branch Locations

AGAT Laboratories has an extensive network of branches and depots located throughout Canada and internationally. Following is a list of Ontario branches.

Branch	Address	Tel/Fax #'s	Reception - Hours of Operation
GeoChem Div. (Lab)	5623 McAdam Road Mississauga, ON L4Z 1N9	**Tel:** 905-501-9998 **Fax:** 905-501-0589	8:00am - 7:00pm M-F 9:00am - 2:00pm Sat
Environmental Lab	5835 Coopers Ave Mississauga, ON L4Z 1Y2	**Tel:** 905-712-5100 **Fax:** 905-712-5122	**Winter Hours:** Jan 2 – March 31 8:00am - 7:00pm M-F 8:00am - 2:00pm Sat **Summer Hours:** April 1 – Dec 31 8:00am - 9:00pm M-F 8:00am - 4:00pm Sat
Kingston Branch	Unit 2 590 Cataraqui Woods DR Kingston, ON K7P 1T8	**Tel:** (613) 384-1888 **Fax:** (613) 384-1493	8:00am - 5:00pm M-F
Kitchener Branch	975 Bleams Road Unit # 4 Kitchner, ON N2E 3Z5	**Tel:** (519) 894-3883 **Fax:** (519) 894-0929	8:00am - 5:00pm M-F
London Branch	300 Exeter Road Units 10-12 London, ON N6L 1A3	**Tel:** 519-652-6826 **Fax:** 519-652-9733	8:00am - 5:00pm M-F
Ottawa Branch	6 Antares Drive Phase II Unit 7 Ottawa, ON K2E 8A9	**Tel:** (613).225-8668 **Fax:** (613).225-8718	8:00am - 5:00pm M-F
Stoney Creek Branch	903 Barton Street East Unit 19 Stoney Creek, ON L8E 5P3	**Tel:** 905-643-8163 **Fax:** 905-643-3391	8:00am - 5:00pm M-F
Sudbury Branch	2054, Kingsway Road Sudbury, ON P3B 4J8	**Tel:** (705) 560-5001 **Fax:** (705) 560-5035	8:00am - 5:00pm M-F