

## Standard Operating Procedure (SOP) 2.4.1

### Protecting Sample Integrity For Water Quality Monitoring

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#### Introduction

Sample integrity is part of Quality Assurance Project Plans. All samples should be collected with enough time for analysis within the holding time of desired analysis. Guidelines need to be followed in order to minimize sample contamination and degradation. In order to ensure good representative data is collected from field samples, field preparation planning must be completed prior to any field activities.

#### Field Preparations

First, one must decide what the objectives of the field sampling event are. Next, a list of field supplies must be generated (Table 1). All meters to be used in the field should be calibrated and checked for proper functioning. Traceable certified standards are to be used and a log kept which shows all calibration and maintenance records. Spare batteries, calibration standards, and back-up meters should be available whenever possible. Sample containers must be inspected for cleanliness (precipitates and residues) and integrity (cracks, broken lid/seal). If preservatives are to be used they may be applied in advance in the laboratory to avoid accidental acid spills in the field. A gallon of distilled water and phosphate free soap is recommended for equipment cleaning between sampling sites. A blank sample (distilled water) may be placed in the ice-chest with ice to confirm no contamination from ice or handling activities occurs.

At least one ice chest is needed for sample preservation. Food and beverages should never be kept in the sample ice chest to avoid illnesses caused by enteric organisms found in surface water.

Health and safety equipment and measures are also part of field preparations. A first aid kit, gloves, life vest, poison IV medication, sun block, and insect repellent are recommended. A cell phone for emergency calls and to check in when entering/exiting a dangerous environment is recommended. A Global Positioning System (GPS) device is advisable to map sample locations for future reference.

#### Field Activities

Use clean disposable gloves when sampling and clearly label bottles and chain of custody with sample information. Samples should be placed in a 4° ice chest and kept at 4° immediately after sampling and until they are received by the analyzing laboratory.

When sampling various stations along a flowing channel (river, creek, etc.) it is best to sample from mouth to head to avoid disturbances that may result in sample contamination. If sampler must stand in the channel, stand downstream and sample in an up-stream direction holding sample collection bottle with the opening towards upstream. Avoid sediment disturbance and collection from stagnant pools.

Tightly close sample bottles and place inside a Ziploc type bag. Samples should be placed in ice-chest immediately after collection. Samples should not be submerged in water during transportation and caution should be taken to minimize bottle breakage.

In addition, field homogenized duplicates and field blanks are a good way to evaluate the integrity of samples.

Samples should be collected first and be immediately followed by field data collection (temperature, turbidity, conductivity, dissolved oxygen, pH, color, odor), sample name, time of sampling, sampler initials and any other pertinent information.

**Post Field Activities**

After completing field activities and prior to transferring samples the field person (sampler) must start a chain of custody for each sample. Each time the sample is transferred from one person to another, the chain of custody form is filled. Upon arrival at the laboratory, sample integrity must be inspected for breakage or leakage, and temperature.

All field meters must be disinfected and checked with standards to measure instrument drift during the field day (a log should be maintained). Sampling equipment such as submergible pumps, reusable filters, homogenizing container, bailers, syringes and any other reusable field equipment that was in contact with sample water should be disassembled and properly cleaned to avoid bacteria and alga growth.

Field data should be read and any correction made in order to copy field data into an electronic database. When the analyzing laboratory provides the sample analysis report the data can then be merged with the field data in the database. Any data discrepancies should be noted.

Table 1. Field preparation sample list for water sampling.

Item description	Quantity	Notes
Field log book (water-proof)		
Sharpies / Pens		
Sample bottles: Glass		
Plastic		
homogenizing container		
Preservatives (acid)		
GPS / Topographic-map		
Cell phone		
Dixie cups		
Syringes		
Tape		
Sip-lock bags		
Ice-chest		
Ice		
Trash bags		
Meters: pH		
Dissolved oxygen		
Turbidity		
Temperature		
Conductivity		
Other		

Disposable globes		
Waders		
Deionizer water (DI)		
<b>Item description</b>	<b>Quantity</b>	<b>Notes</b>
Water pump		
Tubing		
Bailers		
Buckets		
Rope		
First aid kit		
Sun block		
Safety cones		
Measuring tape		
Phosphate free soap		

\*A hat, food, and water are also recommended.

For further guidance visit the SWAMP-Clean Water Team Citizen Monitoring Program website  
 < [http://www.swrcb.ca.gov/water\\_issues/programs/swamp/cwt\\_volunteer.shtml#resource](http://www.swrcb.ca.gov/water_issues/programs/swamp/cwt_volunteer.shtml#resource) >