



1. SCOPE AND APPLICATION

- 1.1 This SOP covers the initial processing and preservation of water quality samples collected for analysis of Water Parameters.
- 1.2 The objective of compliance sampling is that the samples will be representative of all contaminants of the system or source, and that the sample will be handled in so that no significant changes in composition will occur in transit to laboratory

2. MATERIALS AND PROCEDURES

2.1 Materials Required

2.1.1 For sampling

- i. Sample bottles, preservatives, labels and marker pens
- ii. Sample storage/transit containers and ice packs
- iii. Filtering apparatus (if required) ✓ Samplers/sampling equipment
- iv. Rubber boots, waders, etc.
- v. Standard operating procedures for sampling
- vi. Spares of all above items if possible and when appropriate

2.2.2 For Documentation

- i. Pens/wax crayons
- ii. Sample labels
- iii. Field notebook
- iv. Report forms



2.2.3 For On-site Testing

- i. List of analyses to be performed on site
- ii. Check stocks of consumables (including distilled water, pH buffers, standards and blanks); replenish and refresh as appropriate
- iii. Check and calibrate meters (pH, conductivity, dissolved oxygen, turbidity, thermometers)
- iv. Other testing equipment according to local practice
- v. Standard operating procedures and equipment manuals
- vi. Spares (e.g., batteries)
- vii. Tissue Papers

2.2.4 Safety

- i. First-aid kit
- ii. Waders, gloves, etc.
- iii. Fire extinguisher (if appropriate)

3. Sampling Precautions

Do Not:

- ⊗ Contaminate the bottle by touching the inside of the bottle.
- ⊗ Contaminate the bottle lid by touching the inside rim.
- ⊗ Put the bottle lid on the ground while sampling.
- ⊗ Rinse the bottle where preservatives and matrices are used.



- ⊗ Transport aquatic facility water samples with other water samples, e.g. effluent or drinking water.

Always:

- ✓ Collect microbiological samples before collecting other samples.
- ✓ Label the bottle before sampling.
- ✓ Discard damaged or contaminated bottles. If in doubt throw it out and take sample in a new bottle.
- ✓ Wash your hands thoroughly before and collecting samples.

Also:

- ⚠ If there is any reason to suspect that contamination has occurred during sampling, discard the sample and take another sample using a new sampling bottle

3.1 On-site analysis

1. closely follow the instructions provided by the manufacturer of the chemical test kits used at the sampling site;
2. always use contaminant-free containers and where possible, prepare containers and testing equipment at sampling sites;



3. always use devices or instruments that have been calibrated at the required frequency (thermometer and pH-meter);
4. always use contaminant-free containers and where possible, prepare containers and testing equipment at sampling sites;
5. always use devices or instruments that have been calibrated at the required frequency (thermometer and pH-meter);
6. reagents that are used for analysis must be kept in a clean, dry, well-ventilated and dark location until use;
7. always take measurements with reagents in a suitable location. Avoid leaving reagents in prolonged sun exposure;
8. seal reagent bottles correctly after use;
9. never place wet fingers on reagent bottles; this may lead to inaccurate results;
10. verify product expiry dates. Once the date indicated is past, you cannot be certain that results are reliable;
11. discard expired products, in accordance with regulations in effect

3.2 Precautions on documentation

1. keep an accurate record of each sample collected using the correct form or notebook;
2. All measurements taken in the field must be recorded in the field notebook before leaving the sampling station.



3.3 Safety Precautions

1. Wear nitrile gloves to avoid *contact with water, as well as protect wounds on hands*



2. Wash water, soap, and disinfectant should be used after all sampling even if the sampled water appears to be uncontaminated.



Note: - To avoid contamination from water sources

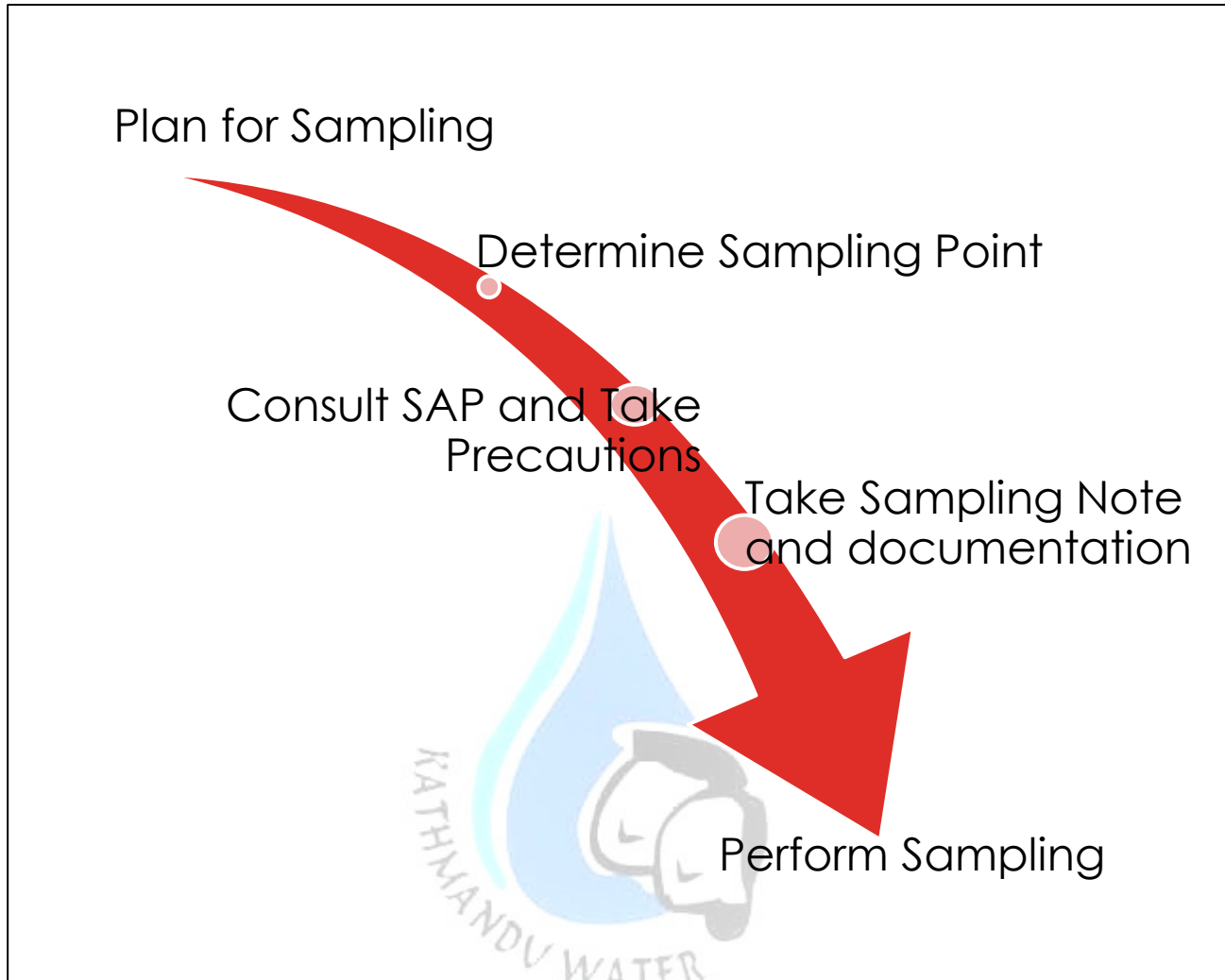
3. Protect feet with Plastic boot covers while in mud or water.

Note: - To avoid contamination of water, places, people, equipment

4. Remove Plastic boot cover before washing hands;
5. Avoid carrying a pencil or Pen in the mouth while sampling.
6. Avoid rubbing eyes.



4. Sample Collection Procedure



4.1 Sampling Guidelines

1. Take a labelled sample bottle.

Make Sure to Lid on until you are ready for sampling

3. Rinse the sample container 3 times with the sample before filling.

Note: This does not apply, however, if the storage/transport bottle already contains a preservative chemical.

4. The temperature of the sample should be measured and recorded immediately after the sample is taken.



5. A small air space should be left in the sample bottle to allow the sample to be mixed
6. All measurements taken in the field must be recorded in the field notebook before leaving the sampling station.
7. Samples should be transferred to sample bottles immediately after collection if they are to be transported. *Note: -If analysis is to be carried out in the field, it should be started as soon as possible.*

4.2 Labeling Sample Bottles

1. Label the sample container properly.
2. The sample code and the sampling date should be clearly marked
3. Information on the sample container or the tag should include:
 - Sample code number (identifying location)
 - Date and time of sampling
 - Source and type of sample
 - Pre-treatment or preservation carried out on the sample
 - Any special notes for the analyst
 - Sampler's name

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Date: Sample number:
Location: Sample time:
Personnel: Note:
Organisation:
Sample type:

4.3 Documenting of sample

1. Complete the sample identification form for each sample.



2. The sample identification form should be filled for each sampling occasion at a monitoring station.
3. If more than one bottle is filled at a site, this is to be registered on the same form.
4. Sample identification forms should be kept in a master file at the laboratory where the sample is analyzed.
5. All supporting information should be recorded in the field notebook before leaving the sampling station.

Importance of Supporting Information

Such conditions as the ambient air temperature, the weather, the presence of dead fish floating in the water or of oil slicks, growth of algae, or any unusual sights or smells should be noted, no matter how trivial they may seem at the time.

IMPORTANT:- These notes and observations will be of great help when interpreting analytical results.

⚠ CAUTION: - Field notebooks should not be discarded but stored for future reference

4.4 Sampling Procedure

A. Sampling from a tap or pump outlet

1. Clean the tap. Use a clean cloth to wipe the outlet and to remove any dirt.
2. Open the tap. Turn on the tap to maximum flow and let the water run for 1-2 minutes. Turn off the tap.

Note: Some people omit the next two steps and take the samples at this stage, in which case the tap should not be adjusted or turned off, but left to run at maximum flow.



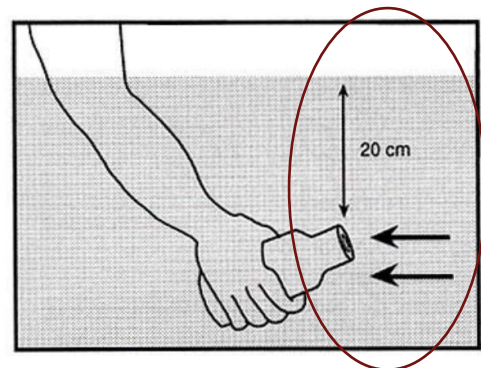
3. Sterilize the tap for 1 minute with a flame (from a gas burner, cigarette lighter or an alcohol-soaked cotton wool swab).
4. Open the tap before sampling. Carefully turn on the tap and allow water to flow at medium rate for 1 - 2 minutes. *Note: - Do not adjust the flow after it has been set.*



B. Sampling water from a water-course or reservoir (Collecting a sample from surface water)

1. Hold the bottle near its bottom and submerge it to a depth of about 20 cm, with the mouth facing slightly downwards.

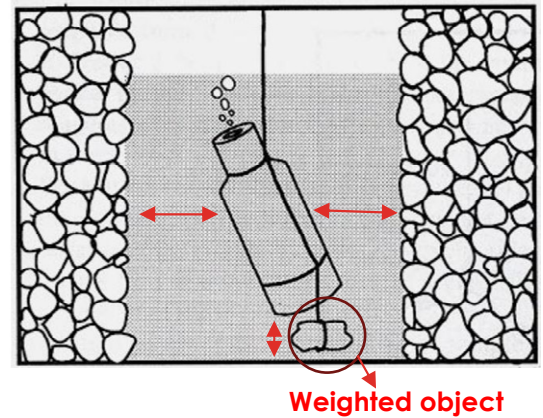
Note: - If there is a current, the bottle mouth should face towards the current and turn the bottle upright to fill it.





C. Sampling from dug wells and similar sources

1. Attach the bottle to the string. Take a sufficient length of string, rolled around a stick, and tie it to the bottle string.
2. Lower the bottle. Lower the weighted bottle into the well, unwinding the string slowly.



Note: - Do not allow the bottle to touch the sides and bottom of the well which disturb any sediment particles.

3. Immerse the bottle completely in the water
4. Raise the bottle. After the bottle is completely full and discard a little water to provide an air space.
5. Cap the bottle.

5. Transport of Sample

1. Samples for chemical analysis should arrive at the analytical laboratory and be analysed within 24 hours of collection, since some variables are subject to change during storage
2. Special Box or Ice Box is used in order to transport Sample from one point to other.

Note: To reduce the sample spillage





6. Preservatives and Preservation of water sample for Chemical Analysis

Refer Table 1

Table 1 Sample preservation and Preservatives

Kathmandu Upatyaka Khanepani Limited Sampling/Handling Guide						
	PARAMETERS	CONTAINER TYPE	PRESERVATIVE	HOLDING TIME	MIN. SAMPLE	See Note
<i>Inorganics and Physical Tests</i>	Acidity or Alkalinity	0.5-1 L plastic	Chill 4°C	14 days	150 mL	
	Ammonia Nitrogen, Total	250 mL plastic/glass	1 mL 1:1 Sulfuric Acid	28 days	100 mL	
	Anions Bromide, Chloride, Fluoride, Sulfate	0.5-1 L plastic	Chill 4°C	28 days	50 mL	
	BOD, Colour, and Turbidity	0.5-1 L plastic	Chill 4°C	2 / 3 days	500 mL	
	Bromate, Chlorate	125 mL plastic	2 mL 0.28% Ethylenediamine	28 days	50 mL	
	Carbon, Inorganic (Dissolved or Total)	125-250 mL amber glass	Chill 4°C	14 days	50 mL	
	Carbon, Organic (Dissolved or Total)	125-250 mL amber glass	1 mL 1:1 Sulfuric Acid	28 days	50 mL	
	Chemical Oxygen Demand (COD)	125-250 mL plastic/glass	1 mL 1:1 Sulfuric Acid	28 days	50 mL	
	Chlorine, Total or Free	125 mL plastic	Chill 4°C (Keep in the dark)	0.25 hours	100 mL	
	Chlorite	125 mL plastic	2 mL 0.28% Ethylenediamine	14 days	50 mL	
	Cyanide - Total, WAD or Free	145 mL plastic	0.5 mL 6N Sodium Hydroxide	14 days	30 mL	
	Electrical Conductivity	0.5-1 L plastic	Chill 4°C	28 days	50 mL	
	Metals, Dissolved or Total, and Hardness	125-250 mL plastic	1.5-3 mL 1:3 Nitric Acid	6 months	120 mL	
	- Chromium, Hexavalent	125 mL plastic	1 mL 50% Sodium Hydroxide	28 days	50 mL	
	- Mercury	40 mL glass vial	0.5 mL 1:1 Hydrochloric Acid	28 days	10 mL	
- Mercury, Ultra Trace	250 mL FLPE	1 mL 1:1 Hydrochloric Acid	28 days	30 mL		



KATHMANDU UPATYAKA KHANEPANI LIMITED

WATER/WASTE WATER QUALITY ASSURANCE DIVISION

**STANDARD OPERATING PROCEDURE
Sampling and Preservation**

SAP001

Effective Date:

Revised No.

Nitrate, Nitrite or Ammonia (unpreserved)	0.5-1 L plastic	Chill 4°C	2 / 3 days	50 mL	
Nitrogen, Kjeldahl or Organic	250 mL plastic/glass	1 mL 1:1 Sulfuric Acid	28 days	200 mL	
Nitrogen, Total	250 mL plastic/glass	1 mL 1:1 Sulfuric Acid	28 days	200 mL	
Oxygen, Dissolved	300 mL BOD bottle	2 pillows MnSO4 & Alkali/Azide	8 hours	300 mL	
pH	0.5-1 L plastic	Chill 4°C	0.25 hours	50 mL	
Phosphate, Ortho (Reactive)	0.5-1 L plastic	Chill 4°C	2 / 3 days	50 mL	
Phosphorus, Total	250 mL plastic/glass	1 mL 1:1 Sulfuric Acid	28 days	100 mL	
Phosphorus, Total Dissolved	250 mL plastic/glass	1 mL 1:1 Sulfuric Acid	28 days	100 mL	
Phosphorus, Total Diss. or Total (unpreserved)	0.5-1 L plastic	Chill 4°C	2 / 3 days	50 mL	
Solids - Filterable (TDS), Non-filterable (TSS)	0.5-1 L plastic	Chill 4°C	7 days	200 mL	

Table 2 Legends used in Table 1

CONTAINERS	
P	Bottles and lid linings are made of the following plastics: high- or low-density polyethylene, polypropylene, polystyrene, polyvinyl chloride or teflon
PPS	Sterile polypropylene bottle
G	Glass bottle
GS	Sterile glass bottle
PRESERVATIVES	
N	No preservative required
ST3	Sodium thiosulfate at a final concentration of 0.01 % (p/v)
OTHER	
N/A	Not applicable



7. References

- ❖ APHA Standard Method, Collection and Preservation of sample, TABLE 1060:I.
SUMMARY OF SPECIAL SAMPLING AND HANDLING REQUIREMENTS
- ❖ EPA Standard Method

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