

## Guidelines on Water Quality Monitoring , 2017

### 1. Short title:-

- (a) This may be called the Guidelines on Water Quality Monitoring, 2017
- (b) The Guidelines would later be notified through Gazette Notification.

### 2. Application: - It shall apply to all organizations, agencies and any other body monitoring surface and ground water quality.

### 3. Definitions:- In this order, unless the context otherwise requires;-

- (a) **“Agencies”** means water quality monitoring agencies involved in water quality monitoring of surface water and ground water;
- (b) **“Authority”** means the Water Quality Assessment Authority (WQAA) constituted under sub-sections (1) and (3) of section 3 of the Environment (Protection) Act, 1986;
- (c) **“Aquifer”** is a geological formation that stores and transmits water;
- (d) **“Accreditation”** means a formal recognition from an appropriate competent authority that a laboratory is competent to carry out specific tests or specific types of tests.
- (e) **“Accredited Laboratory”** means a laboratory that has been evaluated and given recognition by an appropriate competent authority to perform a specified measurement or task, usually for specific parameter and for a specified period of time.
- (f) **“Baseline Station”**: means the water quality monitoring location where there is no influence of human activities on water quality;
- (g) **“Borewell”** means a deep narrow hole made in the ground especially to locate water.
- (h) **“Composite Sample (Time and Flow)”**: *Time composite sample* is a combination of multiple individual samples taken at pre-selected times from a particular location to represent the integrated composition of the water being sampled. Usually all samples added to the composites are equal in volume, but *flow-proportional composite* samples collect amounts proportional to flow.
- (i) **“Depth Integrated Sample”** means a mixture of grab samples collected from different depths at a particular point.
- (j) **“Flux Station (or Impact Station)”** means the location for measuring the mass of particular pollutant on main river stem for measuring the extent of pollution due to human interference or geological feature at any point of time and is necessary for measuring impact of pollution control measures adopted;
- (k) **“Grab Sample”** means a water quality sample collected at a particular time and place representing only the composition of the source at that time and place.

- (l) "Hotspot" means location/site where concentration of a particular parameter or a group of parameters, except bacteriological parameters, are beyond the permissible limits of drinking water quality as prescribed in the BIS code IS 10500:2012.
- (m) "Monitoring" means standardized measurements of identified parameters in the order to define status and trends of water quality;
- (n) "Open Dugwell" means a shallow hole dug down into the water table.
- (o) "Protocol" means a system of uniform water quality monitoring mechanism developed by Water Quality Assessment Authority.
- (p) "Pollutant" means any solid, liquid or gaseous substance present in such concentration as may be, or tend to be, harmful to living bodies.
- (q) "Polluted Stretch" means the polluted locations in a continuous sequence in a river. The polluted location is defined with respect to 'Primary Water Quality Criteria' of Central Pollution Control Board.
- (r) "Quality Assurance Programme" means a programme described in paragraph 13 of this Order.
- (s) "Trend Station" means the monitoring location designed to show how a particular point on a watercourse varies over time due to both geogenic and anthropogenic activities.
- (t) "Tubewell" means a well made by driving a tube into the earth to a stratum/aquifer that bears water
- (u) "Width Integrated Sample" means a mixture of grab samples collected from different width of river/lake along a cross-sectional line.
- (v) "Well" means any structure sunk for the search or extraction of groundwater, including open well, dug well, bore well, dug-cum-bore well, tube well, filter point, collector well, infiltration gallery, recharge wells, disposal well or any of their combinations or variations.
- (w) "Water Quality Monitoring Network" means a systematic planning for collection, preservation, transportation, storage, analysis of water samples and dissemination of data for national water bodies restricted to surface and ground water in the country.

#### 4. Monitoring station and frequency of sampling:

##### I. Surface Water

- (1) The classification of stations and frequency of sampling in respect of surface water shall be as follows:-
- (a) All the stations shall be a combination of Baseline, Trend, Flux (or Impact) stations and Hotspot stations.
- (b) The Baseline stations shall be monitored once in two months (i.e. six times a year) for perennial rivers, lakes/reservoirs and seasonal rivers. Trend stations shall be monitored with an increased frequency of once in a month (i.e. twelve times in a year). Flux (or

- Impact) and Hotspot stations shall be monitored twice a month (i.e. twenty-four times in a year) depending upon pollution potential or importance of water use.
- (c) All agencies shall follow the sampling frequency and parameters for analysis of surface water as mentioned in the Table-I given below:-

**Table — I**  
**Frequencies and parameters for analysis of surface water samples**

1	2	3
Type of Station	Frequency	Parameters
Baseline	<p><b>Perennial rivers and lakes/reservoirs:</b> Six times a year</p> <p><b>Seasonal rivers:</b> Six times (at equal spacing) during flow period</p>	<p style="text-align: center;"><b><u>(A) Pre-monsoon: Once a year</u></b></p> <p>Analyse 25 parameters as listed below:</p> <p>(a) <b>General:</b> Colour, odour, Temperature, pH, Electrical Conductivity (EC), Dissolved Oxygen (DO), Turbidity, Total Dissolved Solid (TDS)</p> <p>(b) <b>Nutrients:</b> Ammoniacal Nitrogen (NH<sub>4</sub>-N), Nitrite &amp; Nitrate Nitrogen (NO<sub>2</sub> + NO<sub>3</sub>), Total Phosphate (Total P)</p> <p>(c) <b>Demand parameters:</b> Bio-chemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD)</p> <p>(d) <b>Major ions:</b> Sodium (Na<sup>+</sup>), Potassium (K<sup>+</sup>), Calcium (Ca<sup>++</sup>), Magnesium (Mg<sup>++</sup>), Carbonate (CO<sub>3</sub><sup>-</sup>), Bicarbonate (HCO<sub>3</sub><sup>-</sup>), Chloride (Cl<sup>-</sup>), Sulphate (SO<sub>4</sub><sup>-</sup>)</p> <p>(e) <b>Other inorganic:</b> Fluoride (F), Boron (B) and other location specific parameter, if any</p> <p>(f) <b>Microbiological:</b> Total Coliform and Faecal Coliform</p> <p style="text-align: center;"><b><u>(B) Rest of the year</u></b></p> <p style="text-align: center;">(After the pre-monsoon sampling, at every two months interval)</p> <p>Analyse 11 parameters: Colour, Odour, Temperature, pH, EC, DO, NO<sub>2</sub><sup>-</sup>, NO<sub>3</sub><sup>-</sup>, BOD, Total Coliform and Faecal Coliform.</p>

<p><b>Trend, Flux/Impact and Hotspots</b></p>	<p><b>Trend:</b> As indicated in column (3)</p> <p><b>Flux/Impact:</b> As indicated in column (3)</p> <p><b>Hotspots:</b> As indicated in column (3)</p>	<p><b>A. (i) For Trend Stations:</b> Analyse 25 parameters as listed for Baseline stations once every month i.e. 12 times a year</p> <p><b>(ii) For Flux/Impact Stations:</b> Analyse 25 parameters as listed for Baseline stations twice every month i.e. 24 times a year.</p> <p><b>(iii) For Hotspot stations:</b> Analyse 25 parameters as listed for Baseline stations twice every month i.e. 24 times a year.</p> <p><b>B. Micropollutants: For Trend, Flux/Impact and Hotspot stations</b></p> <p><b>(i) Pesticides-Analyse once a year during pre-monsoon period</b></p>
		<p>Alachlor, Atrazine, Aldrin/ Dieldrin, alpha-HCH, beta-HCH, gamma-HCH (Lindane), delta-HCH, Butachlor, Chloropyrifos, 2,4-Dichlorophenoxyacetic acid, DDT (o,p' and p,p'-isomers of DDT, DDE and DDD), Endosulfan (alpha, beta and sulphate), Ethion, Isoproturon, Malathion, Methyl Parathion, Monocrotophos, Phorate.</p> <p><b>(ii) Toxic Metals:- Analyse twice a year during pre-monsoon and post monsoon periods</b></p> <p>Arsenic [As (III) &amp; As (V)], Aluminum (Al), Silver (Ag), Cadmium (Cd), Cobalt (Co), Copper (Cu), Chromium [Cr(III) &amp; Cr (VI)], Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Selenium (Se), Zinc (Zn), (The parameters may be selected based on local need)</p> <p><b>(iii) Polynuclear Aromatic Hydrocarbons (PAH), Polychlorinated Biphenyls (PCB) and Trihalomethanes (THM) -Analyse as per site specific requirement.</b></p>

**Note:**

- i. The parameters mentioned in the above Table shall be the minimal requirement. This does not, however, restrict analysis of more parameters depending upon the specific requirements of the analyzing agency and its manpower availability.

- i. For lakes or reservoirs, monitoring of additional parameters, like **Total kjeldhal Nitrogen, Chlorophyll, Total Plankton Count and Productivity** shall be included in the list of parameters.
- iii. If **bio-monitoring** is done in river or lake or reservoir, additional specific parameters are to be considered.
- iv. River water samples may be collected from upstream, centre line and downstream of the rivers in towns identified as Hotspots to evaluate the inflow of pollutants in the town and water quality of the outflow from the town. The point of collection of water samples at downstream of the town should be selected at a location where proper mixing of domestic/industrial effluents with river water has taken place.
- v. Longitudinal DO experiment is need based and site specific. If required, DO experiments may be conducted at least twice a year (once during pre-monsoon season when temperature is high and discharge is low and once during monsoon season) in polluted towns and once in a year during pre-monsoon elsewhere.
- ~~vi. The monitoring agencies should get the analysis done for Pesticides, Toxic metals, PAH, PCB and THM through outsourcing if the present infrastructure is not sufficient.~~
- vii. In case a new pesticide comes in the market in future, it should also be monitored and required facilities should be created in all the apex organizations. Till such infrastructure is created in the organizations, the analytical job can be outsourced to NABL accredited and recognized laboratories and research organizations.
- viii. If **radioactive elements** are reported from a particular place, it is the responsibility of monitoring agency to collaborate with Bhabha Atomic Research Centre (BARC), Mumbai or any other organization under Department of Atomic Energy and get the samples analyzed from there.

## II. Ground Water

The classification of stations and frequency of sampling in respect of ground water shall be as follows:

- (a) All stations shall be classified as Baseline stations.
- (b) Baseline stations shall be re-classified as Trend and Hotspot stations where there is a perceived problem.
- (c) All agencies shall follow the sampling frequency and parameters for analysis of ground water as mentioned in the Table-2 given below:-

**Table — 2**  
**Frequencies and parameters for analysis of ground water samples**

1	2	3
Type of Station	Frequency	Parameters
Baseline	Twice a year (Pre and post monsoon season)	<p><b>A. Pre and Post Monsoon Season:</b> Analyze 22 parameters as listed below:</p> <p>a. <b>General:</b> Colour, Odour, Temperature, pH, EC, TDS</p> <p>b. <b>Nutrients:</b> NO<sub>2</sub><sup>-</sup>, NO<sub>3</sub><sup>-</sup>, Orthophosphate</p> <p>c. <b>Demand Parameter:</b> COD</p> <p>d. <b>Major Ions:</b> Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>++</sup>, Mg<sup>++</sup>, CO<sub>3</sub><sup>-</sup>, HCO<sub>3</sub><sup>-</sup>, Cl<sup>-</sup>, SO<sub>4</sub><sup>-</sup></p> <p>e. <b>Other inorganics:</b> F, B and other location specific parameter, if any</p> <p>f. <b>Microbiological:</b> Total Coliform and Faecal Coliform</p> <p><b>B. Micropollutants:</b></p> <p>(i) <b>Pesticides-</b> Analyze once a year during pre-monsoon period Alachlor, Atrazine, Aldrin/ Dieldrin, alpha-HCH, beta-HCH, gamma-HCH (Lindane), delta-HCH, Butachlor, Chloropyriphos, 2,4-Dichlorophenoxy acetic acid, DDT (o,p' and p,p'-isomers of DDT, DDE and DDD), Endosulfan (alpha, beta ans sulphate), Ethion, Isoproturon, Malathion, Methyl Parathion, Monocrotophos, Phorate.</p> <p>(ii) <b>Toxic Metals-</b> Analyze twice a year during pre-monsoon and post monsoon periods Arsenic (As (III) &amp; As (V), Aluminum (Al), Silver (Ag), Cadmium (Cd), Cobalt (Co), Copper (Cu), Chromium (Cr(III) &amp; Cr (VI), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Selenium (Se), Zinc (Zn), (The parameters may be selected based on local need)</p> <p>(iii) <b>Polynuclear Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs) and Trihalomethanes (THM)-Analyze as per site specific requirement.</b></p>

Trend and Hotspots	Twice a year (Pre and post monsoon season and other times, if required)	<p>A. Pre and Post Monsoon Season: Analyse all the parameters including Micropollutants as listed for Baseline stations.</p> <p>B. Other times (if required): Analyse 15 parameters as listed below:-</p> <p>(a). General: Colour, Odour, Temperature, EC, pH, TDS,</p> <p>(b) Nutrients: NO<sub>2</sub><sup>-</sup>, NO<sub>3</sub><sup>-</sup>, Orthophosphate</p> <p>(c) Demand parameter: COD</p> <p>(d) Major ions: Cl<sup>-</sup></p> <p>(e) Other inorganics: F, B and other location specific parameters, if any.</p> <p>(f) Microbiological: Total Coliform and Faecal Coliform</p> <p>(g) Micropollutants: As per site specific requirement</p>
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Note:

- (i) The parameters mentioned in the above Table shall be the minimal requirement. This does not, however, restrict analysis of more parameters depending upon the specific requirements of the analyzing agency and its manpower availability.
- (ii) If Chemical Oxygen Demand (COD) value exceeds 20 mg/l, the sample shall be analysed for Biochemical Oxygen Demand (BOD) also.
- (iii) The monitoring agencies should get the analysis done for Pesticides, Toxic metals, PAH, PCB and THM through outsourcing if the present infrastructure is not sufficient.
- (iv) In case a new pesticide comes in the market in future, it should also be monitored and required facilities should be created in all the apex organizations. Till such infrastructure is created in the organizations, the analytical job can be outsourced to NABL accredited and recognized laboratories and research organizations.
- (v) If radioactive elements are reported from a particular place, it is the responsibility of monitoring agency to collaborate with BARC, Mumbai or any other organization under Department of Atomic Energy and get the samples analyzed from there.

#### 5. Sample Collection:

- (1) The procedure for sample collection in respect of surface water shall be as under:
  - a) Samples for Baseline and Trend stations shall be collected from well-mixed section of the river or main stem 30 cm below the water surface using a Dissolved Oxygen (DO) sampler or weighted bottle.

b) Samples for Impact stations shall be collected 30 cm below the water surface from the point of interest, such as bathing ghats, downstream of point discharges, water supply intakes and other sources.

c) The Dissolved Oxygen (DO) in the sample shall be fixed immediately after collection and DO analysis shall be done either in the field or in laboratory.

(2) The procedure for sample collection in respect of reservoir water shall be as under:

a) Reservoir water quality has temporal, spatial as well as depth variation. The water is generally not well-mixed and sampling from a single depth may inadequately represent the overall water quality. It is, therefore necessary to ensure that sampling stations are truly representative of the water body.

b) It is necessary to conduct preliminary survey to determine whether and where differences in water quality occur before deciding on the number of stations to establish. The most important feature of water in reservoir is vertical stratification which results in water quality variation along the depth. The vertical stratification at a sampling station can be detected by taking a temperature reading at 1 m below the surface and another at 1 m above the bottom. If there is a significant difference (more than 3 °C) between the two readings, there is a "thermocline" (a layer where the temperature changes rapidly with depth) and the reservoir is stratified. In stratified reservoirs, more than one sample is necessary to describe water quality.

c) For reservoirs of 10 m depth or more, it is essential that the position of the thermocline is first assessed by means of regularly-spaced temperature readings through the water column (e.g. metre intervals). Samples should then be taken according to the position and extent (in depth) of the thermocline. As a general guide, the minimum samples should consist of 1 m below the water surface, just above the determined depth of the thermocline, just below the determined depth of the thermocline, and 1 m above the bottom sediment (or closer if possible without disturbing the sediment). If the thermocline extends through several meters depth, additional samples are necessary from within the thermocline in order to characterise fully the water quality variations with depth.

d) In general, if the water depth at the sampling site is less than 10 m, the minimum sampling programme should consist of a sample taken 1 m below the water surface and another sample taken at 1 m above the bottom sediment.

e) Access to reservoir sampling stations is usually by boat and returning to precisely to the same locations for subsequent samples can be extremely difficult unless GPS is used or alternatively poles may be installed for the purpose.

(3) The procedure for sample collection in respect of ground water shall be as under:

(a) Open dugwells, which are not in use or have been abandoned, shall not be considered as water quality monitoring station. However, such well could be considered for water level monitoring. The ground water quality monitoring agencies should close down the unused open dugwells if they are potential source of microbiological contaminations in the areas without affecting the water level monitoring programme by replacing the abandoned dugwells with piezometers.

(b) Weighted sample bottle to collect sample from an open well about 30 cm below the surface of water may be used. The plastic bucket, which is likely to skim the surface layer only, shall not be used.



- (c) Samples from the production tube wells shall be collected after running the well for about five minutes.
- (d) Non-production piezometers shall be purged using a submersible pump. The purged water volume shall equal 4 to 5 times the standing water volume, before sample is collected.
- (e) For bacteriological samples, when collected from tube wells or hand pump, the spout or outlet of the pump shall be sterilized under flame by spirit lamp before collection of sample in container.

**6. Sample preservation and transportation:**

- (1) The type of containers and sample preservation to be adopted shall be as mentioned in the Table-3 below:

**Table-3**

1 Analysis	2 Container	3 Preservation
General	Glass, PE (polyethylene)	4°C, dark
BOD	Glass, PE	4°C, dark
COD, NH <sub>3</sub> , NO <sub>2</sub> , NO <sub>3</sub>	Glass, PE	H <sub>2</sub> SO <sub>4</sub> , (pH < 2)
Coliform	Glass, PE, Sterilized	4°C, dark
DO	BOD bottle	DO fixing chemicals
Fluoride	PE	None
Phosphate	Glass	None
Pesticides	Glass, Teflon	4°C, dark
Toxic metals	Glass, PE	HNO <sub>3</sub> , (pH < 2)

- (2) Samples shall be transported to concerned laboratory as soon as possible, preferably within forty-eight hours of collection.
- (3) Analysis for coliforms shall be started within twenty-four hours of collection of sample. If time is exceeded, it should be recorded with the result.
- (4) Departments involved in monitoring should provide adequate training to the persons involved in water quality monitoring on collection and preservation techniques of water samples.
- (5) Departments involved should review the sample collection and analysis programme if it is not in conformity with Protocol norms. If it is not possible to adhere to transport time and analysis time due to large number of samples in one laboratory, the departments should outsource the analysis to nearby existing accredited laboratory.
- (6) Sample identification forms for the water sample analysis for surface and ground water samples shall be as per annexed **Form-I** and **Form-II**.

**7. Quantity of samples to be collected:**

The quantity of samples to be collected for analysis shall be as follows:

- 1. General analysis: 1 litre.
- 2. Bacteriological analysis: 100 ml. in sterilized bottle.
- 3. Metal analysis: 250 to 500 ml.
- 4. Pesticide analysis: 100 ml.

#### **8. Sample records:**

- (1) Each laboratory shall have a bound register, which shall be used for registering samples as they are received. A format for sample receipt register is annexed as **Form-III**.
- (2) The Laboratory In-Charge shall maintain a register for assignment of works to specific analyst.

#### **9. Analytical Techniques:**

Each agency shall follow the analytical techniques prescribed in the 'Standard Methods for analysis of Water and Wastewater' published by American Public Health Association (latest edition) or 'Methods for Testing Water and Wastewater-methods of sampling and testing (physical and chemical)' by Bureau of Indian Standards - IS:3025.

#### **10. Analysis records and data validation:**

A recommended format for recording data including all parameters is enclosed as Form – IV. The results of laboratory analyses shall be entered in the format provided in Form – IV (Table-1) for validation. Report of Toxic metals and Pesticide residues may be recorded separately as per Form IV- Table 2a and Table 2b respectively. Validation checks should be performed in the laboratory on completion of the analysis.

#### **11. Manpower requirements in laboratories:**

The manpower requirements shall be optimized by the concerned monitoring agencies in order to get the maximum utilization of man-days for timely completion of analysis.

#### **12. Data Processing, Reporting and Dissemination:**

Each monitoring agency shall process the analytical data and report the data after validation to the Data Centre at the Central Pollution Control Board (CPCB) or Central Water Commission (CWC). The CPCB or CWC shall store the data and disseminate through website or electronic mail to various users on demand. There should be free sharing of data among the various agencies collecting the water quality data.

#### **13. Quality Assurance Programme:**

The Quality Assurance Programme for the laboratories of various agencies shall contain a set of operating principles, written down and agreed upon by the organization, delineating specific functions and responsibilities of each person involved. Each laboratory of water quality monitoring agencies shall follow the guidelines of Quality Assurance Programme prescribed by their respective Central Laboratory or Headquarters and shall participate in Inter Laboratory Quality Assurance Programme like Proficiency Testing (PT) organized by them or any other agency on regular basis. Inter laboratory AQC exercise shall be compulsorily conducted once in a year in all state/central organizations.

#### **14. Accreditation of laboratories:**

The water quality laboratories shall seek recognition from the Ministry of Environment, Forests and Climate Change, Government of India or accreditation from National Accreditation Board for Testing and Calibration Laboratories (NABL) under Ministry of Science and Technology, Government of India. The water quality monitoring agencies/organizations should provide adequate financial support for strengthening of their laboratories with adequate manpower and their upgradation with advance instruments for the purpose of recognition / accreditation.

## FORM - I

## SAMPLE IDENTIFICATION FOR SURFACE WATER SAMPLES

Sample Code :								
Observer :				Agency :		Project :		
Date :		Station Name and Code :						
Time :		Latitude :			Longitude :			
Depth of Sample :		River :			Division :			
Parameter Code	Container				Preservation			
	Glass	PVC	PE	Teflon	None	Cool	Acid	Other
(1) General								
(2) Bacteriology								
(3) BOD								
(4) COD, NH <sub>3</sub> , NO <sub>3</sub>								
(5) Toxic Metals								
(6) Trace Organics								
Source of Water								
<input type="checkbox"/> River	<input type="checkbox"/> Main Current	<input type="checkbox"/> Bridge		<input type="checkbox"/> Water		<input type="checkbox"/> Fresh		
<input type="checkbox"/> Drain	<input type="checkbox"/> Right Bank	<input type="checkbox"/> Boat		<input type="checkbox"/> Sediment		<input type="checkbox"/> Brackish		
<input type="checkbox"/> Canal	<input type="checkbox"/> Left Bank	<input type="checkbox"/> Wading		<input type="checkbox"/> Susp. Matter		<input type="checkbox"/> Salt		
<input type="checkbox"/> Reservoir	<input type="checkbox"/> other	<input type="checkbox"/> other		<input type="checkbox"/> Biota		<input type="checkbox"/> Effluent		
Sample Types	<input type="checkbox"/> Grab	<input type="checkbox"/> Time Comp.	<input type="checkbox"/> Flow Comp.	<input type="checkbox"/> Depth-integ	<input type="checkbox"/> Width-integ			
Sample Device	<input type="checkbox"/> Weighted Bottle			<input type="checkbox"/> Pump		<input type="checkbox"/> Depth Sampler		
Field Determination								
Temperature:	pH		EC		µmhos/cm		DO	mg/L
Odour code	[1] Odour free	[6] Septic		Colour code	[1] Light brown	[6] Dark green		
	[2] Rotten eggs	[7] Aromatic			[2] Brown	[7] Light black		
	[3] Burnt sugar	[8] Chlorinous			[3] Dark brown	[8] Black		
	[4] Soapy	[9] Alcoholic			[4] Light green	[9] Clear		
	[5] Fishy	[10] Unpleasant			[5] Green	[10] Other (Specify)		
Remarks								
Weather	<input type="checkbox"/> Sunny		<input type="checkbox"/> Cloudy		<input type="checkbox"/> Rainy		<input type="checkbox"/> Windy	
Water vel.(m/sec)	<input type="checkbox"/> High (>0.5)		<input type="checkbox"/> Medium (0.1-0.5)		<input type="checkbox"/> Low (<0.1)		<input type="checkbox"/> Standing	
Water Use	<input type="checkbox"/> None				<input type="checkbox"/> Cultivation / Irrigation			
	<input type="checkbox"/> Bathing & Washing				<input type="checkbox"/> Cattle washing			
	<input type="checkbox"/> Melon / vegetable farming				<input type="checkbox"/> Industrial / Organised water supply			

**FORM-II**

**SAMPLE IDENTIFICATION FOR GROUND WATER SAMPLES**

Sample Code											
Observer			Agency				Project				
Date Time		Station Address and Code Location: Village: Tehsil: District: State					Latitude: Longitude:				
Source of Sample		Open dug well / Dug cum bore well			Hand pump		Tube Well/ bore well			Piezometer	
Parameter Code		Container				Preservation					
		Glass	PVC	PE	Teflon	None	Cool	Acid	Other		
(1) General											
(2) Bacteriology											
(3) BOD											
(4) COD											
(5) Toxic Metals											
(6) Trace Organics											
<b>Field Determination</b>											
Temp		°C	pH			EC micromhos/cm					
Odor code	(1) Odor free (3) Burnt sugar (5) Fishy (7) Aromatic (9) Alcoholic	(2) Rotten eggs (4) Soapy (6) Septic (8) Chlorinous (10) Unpleasant	Color code			(1) Light brown (3) Dark brown (5) Green (7) Clear	(2) Brown (4) Light green (6) Dark green (8) Other(specify)				
<b>Hydro geological Information</b>											
<b>Well Data</b>											
Diameter			Q						cm		
Total Depth			D						m bgl		
Static Water Level (Avg.)			SWL						M bgl		
Aquifer Characteristics											
Use of the well/tubewell/bore well											
Depth of Slot pipes									M bgl		
Land use in surrounding area											
<i>If the tubewell/bore well/piezometer is purged, complete below</i>											
<b>Field Flow Measurement</b>											
Static Water Level			SWL						mbgl		
Actual pump setting depth									M		
Purging duration									min		
Pump discharge			Q						L/min		
Volume purged			V						L		

FORM-III

Sample Record for Analysis

Date / time received at lab	Date / time collected	Lab. ID No	Station Name and Code	Tehsil/ District	Project	Collecting agency / collector	Preservation	Parameter Code
1	2	3	4	5	6	7	8	9

Sample receipt register

Note:

- Column (3) gives the laboratory sample assigned to the sample as it is received in the laboratory. Note that the numbering has two parts separated by hyphen. The first part is assigned in a sequential manner as samples are received from various stations. If two samples are collected at the same time from a station for different sets of analysis, the first part of the number is the same. The second part corresponds to the parameter code as given in the sample.
- Column (4) gives the station code conventionally followed by the monitoring agency.
- Column (6) gives the project under which the sample is collected.
- Column (9) corresponds to the parameter(s) code given in the sample identification form.
- The result of the analysis of all the samples having the same first part of the code would be entered in the data entry system as one sample having the same station code and time of sample collection.

Lab. Sample No.
Water Quality Stations
Date of Sampling
Total Cations (meq/L)
Total Anions (meq/L)
Ion Balance (%)
pH vs Alkalinity (If pH < 8.3, P, Alk = 0)
% Sodium
SAR
RSC
TDS/EC Ratio
BOD/COD Ratio

Lab. Sample No.
Water Quality Stations
Date of Sampling
Temperature (°C)
Colour Code
Odour Code
DO (mg/L)
pH
EC (umhos/cm)
TDS (mg/L)
Turbidity (NTU)
NH <sub>4</sub> -N (mg/L)
NO <sub>3</sub> (mg/L)
NO <sub>2</sub> (mg/L)
PO <sub>4</sub> -P (mg/L)
BOD (mg/L)
COD (mg/L)
Phenolphthalein (mg/L as CaCO <sub>3</sub> )
Total (mg/L as CaCO <sub>3</sub> )
Total (mg/L as CaCO <sub>3</sub> )
Calcium (mg/L as CaCO <sub>3</sub> )
Na <sup>+</sup> (mg/L)
K <sup>+</sup> (mg/L)
Ca <sup>2+</sup> (mg/L)
Mg <sup>2+</sup> (mg/L)
CO <sub>3</sub> <sup>2-</sup> (mg/L)
HCO <sub>3</sub> <sup>-</sup> (mg/L)
Cl <sup>-</sup> (mg/L)
SO <sub>4</sub> <sup>2-</sup> (mg/L)
F <sup>-</sup> (mg/L)
Boron (mg/L)
Silicate (mg/L)
Total (MPN/100ml)
Fecal (MPN/100ml)
Total Cations (meq/L)
Total Anions (meq/L)
Ion Balance (%)
pH vs Alkalinity (If pH < 8.3, P, Alk = 0)
% Sodium
SAR
RSC
TDS/EC Ratio
BOD/COD Ratio

FORM - IV, Table 1

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Micropollutants-Pesticide Residues

Lab. Sample No.			
Water Quality Stations			
Date of Sampling			
Date of Receipt			
Signature of Analyst	Checked By	micrograms/L	Alachlor
			Atrazine
			Aldrin/ Dieldrin
			Alpha HCH
			Beta HCH
			Butachlor
			Chloropyriphos
			Delta HCH
			2,4-Dichlorophenoxy acetic acid
			DDT (o,p and p,p-isomers of DDT, DDE and DDD)
			Endosulfan (alpha, beta and sulphate)
			Ethion
			Gamma-HCH (Lindane)
			Isoproturaon
			Malathion
			Methyl parathion
			Monocrotophos
			Phorate

Form-IV, Table 2a

Lab. Sample No.	Water Quality Stations	Date of Sampling	Date of Receipt	Micropollutants-toxic metals																	
				Al	As	As(III)	As(V)	Cd	Cr	Cr(VI)	Cr(VI)	Cu	Co	Hg	Mn	Ni	Pb	Se	Zn		

Signature of Analyst

Checked By

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