

Stream Sampling Form instructions

There are two types of records used for collecting stream water samples; one documents sample site characteristics and the other documents that actual water samples. Site characteristics are documented on two forms called Stream Sampling – Site Documentation (Form 1 and Form 2). These forms are used to document new sampling sites and to clarify and update existing site information.

The Stream Sampling – Sample Records (Form 3, Form 4, and Form 5) are used to record each sample site visit. These forms are to be completed each time you visit a sample site and collect data.

Site Information is needed at the top of each form, but varies slightly.

Form 1 and Form 3

Basic Site Information

1. Forest Name: document the National Forest where the sample will be collected.
2. Wilderness Name (if applicable): If the sample site is in a wilderness area, document the wilderness name.
3. Stream Name (USGS): Document the stream name where the sample site is located. In some cases the stream will not have a name, in this case document “Unnamed Stream” or “Unnamed Tributary to *Name of Stream*”.
4. Stream Name (Local): Document the local stream name. In most cases this will be the same as the USGS stream name. In some cases an unnamed USGS stream may have a local name associated with it.
5. Site Name: Document the specific site name, as there may be more than one site on a single stream there is a need for a unique sample site name. This unique site name should be developed at the project level. For example, you have a stream named “Mill Creek” with 3 different sample site locations you may call each site “Mill Creek SS1”, “Mill Creek SS2”, and “Mill Creek SS3”.
6. Site ID: There is a need to have a unique identifier for each sample site location and this Site ID should also be developed at the project level. The unique ID can be a mix of letters and numbers in any logical sequence (make sure to document the naming convention). In this case you may want to look bigger than the stream where the samples are being taken to a forest or regional scale. Using the example above, for site name “Mill Creek SS1” on the Smokey Forest, in Region 10. You may abbreviate the names and numbers in the ID, for example, R10SFMILLCKSS1. R10 = Region 10, SF = Smokey Forest, MILLCK = Mill Creek, SS1 = Sample Site 1.
7. Date of Visit: Enter the date you visit the sample site. Check the box whether this is the first “Initial” visit to this site to establish it as part of a survey or monitoring effort, or if this site has been visited and documented previously and therefore this is a “Subsequent” visit.
8. Field Team Leader Information: Enter the name, affiliation, phone number, and email address of the responsible field person.

9. Access Information: Check all boxes that apply to the access of this site. Document any travel directions (attach map if available), estimated time of travel and any additional information that may be helpful in getting to this site.

Form 2, Form 4, and Form 5

Note that each of these Forms has space near the top to enter information that identifies the stream, sample site and the date of sampling. This is an abbreviated version of the “Basic Site Information” described above. It is important to fully complete this “header” information on each Form to ensure data is kept together and consistent.

The instructions for completing the following four attributes are described under **Basic Site Information above**.

- Stream Name (Local): see item 4 above.
- Date of Visit: see item 7 above.
- Site Name: see item 5 above.
- Site ID: see item 6 above.

Stream Sampling – Site Documentation Form 1

Site Verification, GPS Information and Tagging

Most of this data will be collected and recorded at the sample site.

1. Stream Verified: Does the available data match conditions observed on the ground sufficiently to verify that the intended sampling site has been located (check Yes/No)? Check all methods used to verify that you have located the correct site.
2. GPS Information: Record the coordinates from the GPS unit —Latitude and Longitude in decimal degrees (if possible to 6 decimal places)—include the Datum of the collected coordinates (e.g., NAD83). Record the Elevation in feet or meters, and if the GPS unit has the capability, record its accuracy in feet or meters.
3. Site Tag: Record whether a metal tree tag has been affixed to a prominent tree in proximity to the sampling site. (Many wilderness areas do NOT allow the use of aluminum tags.) If a tag has been used, indicate the tree species the tag is attached to. If the species is not known, record *unknown*. Record whether the tag was affixed to the tree on a previous trip (existing tag) or newly placed on this trip (new tag). Describe the tree and its location relative to the sampling site. Include in the description the height above the ground and compass bearing from the tag to the sampling site.

Site Assessment

The site assessment data will be collected from field observations (within 20 meters of the streambank) and recorded at the sample site.

1. Streambank Characteristics: Estimate the percentages of vegetation types along the streambank (i.e., forest/shrub, herbaceous, wetland, barren). Also look at the observed land use in the same area, identify shoreline modifications (e.g., dock, riprap), development and/or agriculture. Use the following classes for these estimates (record the percent range on the form):
 - a. Rare (< 5%)
 - b. Sparse (5-25%)
 - c. Moderate (25-75%)
 - d. Extensive (> 75%)
2. Vegetation-Dominant Age Class (forested areas only): If the site is located within a forested area estimate the dominant age class of the trees. Check the appropriate age class box (i.e., 0-10 years, 10-25 years, 25-50 years, or > 50 years).
3. Dominant Plant Species: Observe the dominant plant species within the area of the sample site, if known, record on Form 1.
4. Beaver Activity: Document observed beaver activity, check the appropriate boxes on the form.

Watershed Assessment

Most of this information can be obtained in the office through GIS analysis and aerial photo interpretation prior to visiting the sample site. It can be helpful to have this information completed prior to the first sampling visit. This information will help to locate the targeted sample location. In addition, the information is useful to verify (in the field) if the GIS analysis appears to be a valid identification of watershed characteristics.

1. Vegetation/Cover: Using GIS, ortho and/or aerial photos estimate the different vegetation types including exposed rock and talus. Document this as a percent of the watershed area above the sample site. Verify in the field if this appears to be a valid identification.
2. Lithology: If GIS information on bedrock lithology is available, indicate the primary lithology (e.g., granitic, volcanic, metamorphic). If there is more than one lithology, make note of additional significant lithology.
3. Watershed area: Using GIS digitize the watershed area above the sample site (the watershed size will vary based on the sample site location). Calculate the watershed area in acres or hectares. It will be helpful to determine the watershed area and boundary prior to determining other watershed assessment attributes.
4. Primary watershed aspect: the primary aspect of the watershed is determined by estimating the direction the watershed is facing based on the direction of stream flow. Indicate the aspect in degrees with North being 0°, East 90°, South 180°, and West 270°.
5. Average watershed slope: A simple way of calculating average slope percent within the watershed boundary is to use DEM GIS files and Zonal Stats in GIS Spatial Analyst.

6. Stream order: Identify the stream order at the sampling site location using the Forest Service NHD dataset.

Stream Sampling – Site Documentation Form 2

Photo Log

Take two photos of the sampling site looking both upstream and downstream. On the initial visit to the site it can be helpful to take additional photos to visually record stream and site characteristics (e.g., land use and vegetation). Record the photo ID or file name, date photographed, and description of the photo. It is recommended to attach these photos to the site documentation forms to include in the Forests hard copy files.

Description and Sketch of Site

Record a description and sketch of the site. This information can help in locating and characterizing the site, it may include access and tree tag information, land marks, and land use indicators.

Additional Notes

Add any additional information that may help to identify, locate, or describe this site.

Stream Sampling – Sample Record Form 3

When collecting water chemistry data care must be taken to protect samples from contamination. It is recommended to collect the water samples prior to the general observations (e.g., stream width and depth); this will ensure stream bottom sediments will not be stirred up causing the possibility of contamination of the water samples.

Basic Site Information

Suggested Revisions: Examine information recorded on the Stream Sampling Site Documentation Forms. Indicate any suggested revisions or updates to the site documentation form. Place a check mark in all boxes requiring revision; explain the suggested revision in the space provided.

Water Samples and Replicates

1. Time Sampled: Indicate time of sample collection, using a 24-hour clock (thus, 4 pm is 1600). Note that the time recorded on the bottle(s) and syringe(s) for the replicates should differ from the time recorded for the normal (regular) sample. This is important! The recommended protocol is to separate the sampling times for normal and replicate samples by one minute.
2. Sample ID: Enter the unique identification code assigned to the sample (developed at the project level). These Sample ID codes are designed to be familiar to the project personnel and can represent the specific site, sample, type, and date, etc. For example, the Site ID combined with the sample type and/or date (e.g., "SITEIDREG" for a regular sample or SITEIDREP for a replicate sample). Note: Bar Codes provided by the ARM Lab are a unique identifier and have a specific location for placement on the form (see item 6 below).

The sample ID represents a sample of water (bottle(s) and/or syringes) intended to represent conditions at a particular location, on a particular day, at a particular time. *Note that multiple containers (bottle and/or syringes) obtained within one time window represent the SAME sample and receive the SAME ID code (and Bar Code).* Replicated samples will receive different ID codes (and Bar Codes).

3. Sample Type: Record the type of sample collected (i.e., regular, replicate, or field blank).
4. Bottle Type: Record the type of bottle (or syringe) used for sample collection (i.e., plastic, glass, or syringe).
5. Number of Bottles: Record the number of samples (aliquots) collected for the normal (regular) sample and any replicates that may have been collected.
6. Bar Code: The bar code (a unique number/letter ID) will be prepared and provided by the ARM Lab. Each year the lab provides new bar codes specific for that year. The bar code sheets will have multiple stick-on copies of the same barcode. These can be organized prior to field sampling and subsequently be affixed to the Stream Sampling Record Form, the Chain of Custody Form, and to each container (bottle or syringe) for the sample.
7. Collection Location: If the sample was not collected at the intended (targeted) location, explain the reason for changing the sample location.

General Observations

1. Air Temperature: Record the air and water temperature to the nearest degree and document the time (24hr) when it was measured. Record whether expressed in degrees C or degrees F.
2. Weather Condition (current and previous): Check the boxes that best describe the collection-day weather up to the time of sampling and the average weather over the previous 3 days (if known).
3. Stream Depth: Record the stream depth measured at sample site in mid-channel, check the box for the appropriate measurement units.
4. Stream Width: Record the stream width measured at the sample site; check the box for the appropriate measurement units.
5. Observed Discharge Level: Indicate the observed level of discharge in the stream at the time of sampling. Check the appropriate box (i.e., no flow, low flow, normal flow, or flood).
6. Delivery Method: Record the delivery method type.

Stream Sampling – Sample Record Form 4

On-Site Water Data (optional)

If on-site water data were collected, record the measured values—the time measurements were taken, air temperature and water temperature (at sample site). Check the box for the appropriate measurement units. Note: Field Instrument Data - Express DO in units of mg/L and, if possible, % DO. Correct specific conductance to 25° C. Record the measurements, instruments and methods used for on-site water data collected.

Photo Log

Take two photos of the sampling site looking both upstream and downstream. It can be helpful to take additional photos to visually record stream and site characteristics (e.g., land use and vegetation).

Record the photo ID or file name, date photographed, and description of the photo. It is recommended to attach these photos to the site documentation forms to include in the Forests hard copy files.

Additional Notes

Add any additional information that may help to identify, locate, or describe this sample site.

Stream Sampling – Sample Record Form 5

This form is for collecting stream water stage and discharge data.

General information

Record the time this data was obtained and indicate what methods were used to collect an estimate of stream stage or discharge (check appropriate boxes). Complete the appropriate stage or discharge section on the form (Stage Measurement Only, Velocity-Area Procedure, or Timed Filling Procedure).

Stage Measurement Only

If stage measurements (estimates) were made in the field, record the measured value and indicate the unit of measure. Describe the location of measurement. Indicate if a rating curve has been developed with which to estimate discharge from stage measurements at this location, and indicate what the stage is referenced to (i.e., fixed staff gage, permanent landscape feature).

Discharge Measurement by Velocity-Area Procedure

If the velocity-area procedure was used to measure discharge, check “yes” and indicate the units of measurement for water depth and velocity. Record the approximate width of the stream at the sampling location. Record the water depth and velocity in each of up to 20 evenly spaced intervals of the stream cross section.

Discharge Measurement by Timed Filling Procedure

If the timed filling method was used to measure discharge, check “yes” and indicate the units of measurement for time and water volume. Record the time and volume measurements for five separate trials at each of up to three spillway locations.