PHASE I

For Office Use Only
Partner ID: _____
Date Received: _____
Date Approved: _____
Approved by (name): _____

The Meadows Center for Water and the Environment
Texas State University

Email to: TxStreamTeam@txstate.edu
Send to: Texas Stream Team
The Meadows Center - Texas State University
601 University Drive
San Marcos, TX 78666-4616

Texas Stream Team
ADVANCED ENVIRONMENTAL MONITORING FORM
PLEASE PRINT LEGIBLY

Sample Date (M M D D Y Y Y Y)

Sample Time (military) (H H M M)

Site ID #

Sample Depth (meters) (not total depth)

Citizen Scientist's Name _____

Site Description _____

Group or Affiliation _____

Field Quality Control:
Was a QC field audit session conducted for this sampling event? ☐ Yes ☐ No

Field Observations:

- FLOW SEVERITY: 1-no flow 2-low 3-normal 4-flood 5-high 6-dry
- ALGAE: 1-absent 2-rare (<25%) 3-common (26-50%) 4-abundant (51-75%) 5-dominant (>75%)
- WATER SURFACE: 1-clear 2-scum 3-foam 4-debris 5-sheen
- WATER CONDITIONS: 1-calm 2-ripples 3-waves 4-white caps
- PRESENT WEATHER: 1-clear 2-cloudy 3-overcast 4-rain
- DAYS SINCE LAST SIGNIFICANT PRECIPITATION (runoff)
- TIDE STAGE (coastal only) 1-low 2-falling 3-slack 4-rising 5-high
- RAINFALL ACCUMULATION (inches within the last 3 days)
- WATER COLOR: 1-no color 2-light green 3-dark green 4-tan 5-red 6-green/brown 7-black
- WATER CLARITY: 1-clear 2-cloudy 3-turbid
- WATER ODOR: 1-none 2-oil 3-acrid (pungent) 4-sewage 5-rotten egg 6-fishy 7-musky

Streamflow Estimate:

- FLOW MEASUREMENT METHOD: 1-flow gauge station 2-streamflow estimate
- WIDTH (ft)
- DEPTH (ft) — AVERAGE
  Depth 1: _____ Depth 5: _____ Depth 9: _____
  Depth 2: _____ Depth 6: _____ Depth 10: _____
  Depth 3: _____ Depth 7: _____
  Depth 4: _____ Depth 8: _____
- TIME (sec) — AVERAGE
  Time 1: _____ Time 2: _____ Time 3: _____
- VELOCITY (ft/s) = *10ft / AVG TIME* — AVERAGE
- DISCHARGE (cfs) = *WIDTH x AVG DEPTH x AVG VELOCITY*

Turbidity:

- NEPHELOMETRIC TURBIDITY UNITS (NTU)
- TURBIDITY TUBE (meters) _____

Orthophosphate (Soluble Phosphates):

- VALUE (mg/L)
- TIME SPENT TRANSPORTING (minutes) _____
- FILTERED ☐ Yes ☐ No
- RANGE
  LOW: *OBSERVED VALUE* _____ */50* = _____ mg/L
  MID: *OBSERVED VALUE* _____ */10* = _____ mg/L
  HIGH: *OBSERVED VALUE* = _____ mg/L

Nitrate-Nitrogen:

- RESULT (mg/L or ppm)
- TIME SPENT TRANSPORTING (minutes) _____

Comments:

Please do not fill out the remaining sections if you are also submitting a Core Environmental Monitoring Form with this information.

Presence of Litter: Please check Yes or No

MONOFILAMENT REMOVED ☐ Yes ☐ No
Amount (please circle): 0-5 ft 6-15 ft 16 ft+

NURDLE SURVEY ☐ Yes ☐ No
TRASH REMOVED ☐ Yes ☐ No

TOTAL TIME SPENT SAMPLING AND TRAVELING _____ Minutes

TOTAL ROUNDTRIP DISTANCE TRAVELED _____ Miles

TOTAL NUMBER OF PARTICIPANTS _____

I certify that all procedures, including the items listed in the Quality Control Checklist on the following page and in the manual, have been followed.

CERTIFIED CITIZEN SCIENTIST'S SIGNATURE _____ DATE _____

Prepared in cooperation with the Texas Commission on Environmental Quality and the United States Environmental Protection Agency.
Revised February 02, 2022.

ADVANCED FIELD QUALITY CONTROL CHECK LIST

Citizen scientists are required to check all applicable boxes for each monitoring event to verify the procedures are followed. If the monitoring event fulfills a Field Audit Session, the trainer must observe the citizen scientist conducting the monitoring event and document observations in the comments field. The trainer will also sign to verify Field Audit Session was conducted.

General Procedures

- ☐ Samples were transported on ice if testing did not occur at monitoring site.
- ☐ Gloves were worn or hand sanitizer was applied throughout.
- ☐ None of the reagents used for testing were expired.
- ☐ All reagents were stored at room temperature or in an environment protected from extreme weather prior to use.
- ☐ Sampling was conducted at approximately the same time/day as previous sampling events at this site, preferably before noon or after 4pm (16:00).
- ☐ Monitoring sample was collected from the centroid of flow with minimal streambed disturbance.
- ☐ All equipment was rinsed twice with sample water before the test was conducted.
- ☐ All equipment was rinsed twice with deionized water after testing was completed.
- ☐ All relevant measurements were recorded in appropriate fields on monitoring form.

Field Observations:

- ☐ **Algae:** Recorded algae observed on the water surface and below the water surface.
- ☐ **Water Color:** Observed water color in a plastic cup or bucket with a white background.
- ☐ **Water Clarity:** Observed the relative cloudiness of the water from bridge or banks.
- ☐ **Water Odor:** Tested by wafting from plastic cup or bucket.
- ☐ **Present Weather:** Marked cloudy if there is a least one cloud in the sky.

Streamflow Estimate

- ☐ A cross section of the waterbody was chosen that is consistent in depth and free of ripples, backwater, and pools.
- ☐ Water depth was measured in 2-foot increments.
- ☐ The 10-foot downstream measurement was measured from the centroid of the cross section.
- ☐ The timer was started from the moment the whiffle ball/floating object touched the water. Not from the moment it was released.
- ☐ Discharge was recorded with one decimal place if <10. If >10 the value was recorded to the nearest whole number.

Turbidity

- ☐ Sample was collected in the centroid of the waterbody, facing upstream, with minimal streambed disturbance.
- ☐ Water was released from tube until the disk became barely visible.
- ☐ Turbidity tube value was reported in meters.

Orthophosphate

- ☐ Sample was properly filtered, if appropriate.
- ☐ The orthophosphate value was calculated accurately depending on the range observed (i.e, low, mid, high).

Nitrate-Nitrogen

- ☐ Sample tubes were completely inverted to dissolve the tablets.
- ☐ Tube with Nitrate #2 Tablet was immediately placed in protective sleeve if testing occurred outdoors.

Field Audit Session

This section should be filled out by a certified trainer ONLY if a Field Audit Session was conducted. Field Audit Sessions are required at a minimum every two years.

Legible Trainer Full Name:_____ Trainer Signature:_____

Trainer Comments:

_____

_____

PHASE II

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Approved by (name): _____

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Texas Stream Team
ADVANCED ENVIRONMENTAL MONITORING FORM
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Sample Date ☐☐☐☐☐☐☐☐ (M M D D Y Y Y Y)

Sample Time (military) ☐☐☐☐ (H H M M)

Site ID # ☐☐☐☐☐

Sample Depth (meters) ☐☐☐☐☐ (not total depth)

Citizen Scientist's Name _____

Site Description _____

Group or Affiliation _____

Field Quality Control:
Was a QC field audit session conducted for this sampling event? ☐ Yes ☐ No

Field Observations:

☐ FLOW SEVERITY: 1-no flow 2-low 3-normal 4-flood 5-high 6-dry

☐ ALGAE: 1-absent 2-rare (<25%) 3-common (26-50%) 4-abundant (51-75%) 5-dominant (>75%)

☐ WATER SURFACE: 1-clear 2-scum 3-foam 4-debris 5-sheen

☐ WATER CONDITIONS: 1-calm 2-ripples 3-waves 4-white caps

☐ PRESENT WEATHER: 1-clear 2-cloudy 3-overcast 4-rain

☐ DAYS SINCE LAST SIGNIFICANT PRECIPITATION (runoff)

☐ TIDE STAGE (coastal only) 1-low 2-falling 3-slack 4-rising 5-high

☐ RAINFALL ACCUMULATION (inches within the last 3 days)

☐ WATER COLOR: 1-no color 2-light green 3-dark green 4-tan 5-red 6-green/brown 7-black

☐ WATER CLARITY: 1-clear 2-cloudy 3-turbid

☐ WATER ODOR: 1-none 2-oil 3-acrid (pungent) 4-sewage 5-rotten egg 6-fishy 7-musky

Streamflow Estimate:

☐ FLOW MEASUREMENT METHOD: 1-flow gauge station 2-streamflow estimate

☐ WIDTH (ft)

☐ DEPTH (ft)
AVERAGE
Depth 1: _____ Depth 5: _____ Depth 9: _____
Depth 2: _____ Depth 6: _____ Depth 10: _____
Depth 3: _____ Depth 7: _____
Depth 4: _____ Depth 8: _____

☐ TIME (sec)
AVERAGE
Time 1: _____ Time 2: _____ Time 3: _____

☐ VELOCITY (ft/s) = *10ft / AVG TIME*
AVERAGE

☐ DISCHARGE (cfs) = *WIDTH x AVG DEPTH x AVG VELOCITY*

Turbidity:

☐ NEPHELOMETRIC TURBIDITY UNITS (NTU)

TURBIDITY TUBE (meters) _____

Orthophosphate (Soluble Phosphates):

☐ VALUE (mg/L)

TIME SPENT TRANSPORTING (minutes) _____

FILTERED ☐ Yes ☐ No

RANGE
LOW: *OBSERVED VALUE* _____ */50* = _____ mg/L
MID: *OBSERVED VALUE* _____ */10* = _____ mg/L
HIGH: *OBSERVED VALUE* = _____ mg/L

Nitrate-Nitrogen:

☐ RESULT (mg/L or ppm)

TIME SPENT TRANSPORTING (minutes) _____

Comments:

_____
_____
_____
_____
_____
_____
_____
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_____
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_____
_____
_____

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Presence of Litter: Please check Yes or No

MONOFILAMENT REMOVED ☐ Yes ☐ No
Amount (please circle): 0-5 ft 6-15 ft 16 ft+

NURDLE SURVEY ☐ Yes ☐ No
TRASH REMOVED ☐ Yes ☐ No

TOTAL TIME SPENT SAMPLING AND TRAVELING ☐☐☐ Minutes

TOTAL ROUNDTRIP DISTANCE TRAVELED ☐☐☐ Miles

TOTAL NUMBER OF PARTICIPANTS ☐☐☐

I certify that all procedures, including the items listed in the Quality Control Checklist on the following page and in the manual, have been followed.

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CERTIFIED CITIZEN SCIENTIST'S SIGNATURE DATE

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Revised February 02, 2022.

ADVANCED FIELD QUALITY CONTROL CHECK LIST

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- ☐ All reagents were stored at room temperature or in an environment protected from extreme weather prior to use.
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- ☐ All equipment was rinsed twice with sample water before the test was conducted.
- ☐ All equipment was rinsed twice with deionized water after testing was completed.
- ☐ All relevant measurements were recorded in appropriate fields on monitoring form.

Field Observations:

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- ☐ **Water Clarity:** Observed the relative cloudiness of the water from bridge or banks.
- ☐ **Water Odor:** Tested by wafting from plastic cup or bucket.
- ☐ **Present Weather:** Marked cloudy if there is a least one cloud in the sky.

Streamflow Estimate

- ☐ A cross section of the waterbody was chosen that is consistent in depth and free of ripples, backwater, and pools.
- ☐ Water depth was measured in 2-foot increments.
- ☐ The 10-foot downstream measurement was measured from the centroid of the cross section.
- ☐ The timer was started from the moment the whiffle ball/floating object touched the water. Not from the moment it was released.
- ☐ Discharge was recorded with one decimal place if <10. If >10 the value was recorded to the nearest whole number.

Turbidity

- ☐ Sample was collected in the centroid of the waterbody, facing upstream, with minimal streambed disturbance.
- ☐ Water was released from tube until the disk became barely visible.
- ☐ Turbidity tube value was reported in meters.

Orthophosphate

- ☐ Sample was properly filtered, if appropriate.
- ☐ The orthophosphate value was calculated accurately depending on the range observed (i.e, low, mid, high).

Nitrate-Nitrogen

- ☐ Sample tubes were completely inverted to dissolve the tablets.
- ☐ Tube with Nitrate #2 Tablet was immediately placed in protective sleeve if testing occurred outdoors.

Field Audit Session

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Legible Trainer Full Name:_____ Trainer Signature:_____

Trainer Comments:

_____

_____

PHASE III

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Partner ID: _____
Date Received: _____
Date Approved: _____
Approved by (name): _____

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Texas State University

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Send to: Texas Stream Team
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Texas Stream Team
ADVANCED ENVIRONMENTAL MONITORING FORM
PLEASE PRINT LEGIBLY

Sample Date ☐☐☐☐☐☐☐☐ (M M D D Y Y Y Y)

Sample Time (military) ☐☐☐☐ (H H M M)

Site ID # ☐☐☐☐☐

Sample Depth (meters) ☐☐☐☐☐ (not total depth)

Citizen Scientist's Name _____

Site Description _____

Group or Affiliation _____

Field Quality Control:
Was a QC field audit session conducted for this sampling event? ☐ Yes ☐ No

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☐ DAYS SINCE LAST SIGNIFICANT PRECIPITATION (runoff)

☐ TIDE STAGE (coastal only) 1-low 2-falling 3-slack 4-rising 5-high

☐ RAINFALL ACCUMULATION (inches within the last 3 days)

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Streamflow Estimate:

☐ FLOW MEASUREMENT METHOD: 1-flow gauge station 2-streamflow estimate

☐ WIDTH (ft)

☐ DEPTH (ft) AVERAGE

Depth 1: _____ Depth 5: _____ Depth 9: _____
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Depth 3: _____ Depth 7: _____
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☐ TIME (sec) AVERAGE

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Turbidity:

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TURBIDITY TUBE (meters) _____

Orthophosphate (Soluble Phosphates):

☐ VALUE (mg/L)

TIME SPENT TRANSPORTING (minutes) _____

FILTERED ☐ Yes ☐ No

RANGE
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Nitrate-Nitrogen:

☐ RESULT (mg/L or ppm)

TIME SPENT TRANSPORTING (minutes) _____

Comments:

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MONOFILAMENT REMOVED ☐ Yes ☐ No
Amount (please circle): 0-5 ft 6-15 ft 16 ft+

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TRASH REMOVED ☐ Yes ☐ No

TOTAL TIME SPENT SAMPLING AND TRAVELING ☐☐☐ Minutes

TOTAL ROUNDTRIP DISTANCE TRAVELED ☐☐☐ Miles

TOTAL NUMBER OF PARTICIPANTS ☐☐☐

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Streamflow Estimate

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- ☐ Discharge was recorded with one decimal place if <10. If >10 the value was recorded to the nearest whole number.

Turbidity

- ☐ Sample was collected in the centroid of the waterbody, facing upstream, with minimal streambed disturbance.
- ☐ Water was released from tube until the disk became barely visible.
- ☐ Turbidity tube value was reported in meters.

Orthophosphate

- ☐ Sample was properly filtered, if appropriate.
- ☐ The orthophosphate value was calculated accurately depending on the range observed (i.e, low, mid, high).

Nitrate-Nitrogen

- ☐ Sample tubes were completely inverted to dissolve the tablets.
- ☐ Tube with Nitrate #2 Tablet was immediately placed in protective sleeve if testing occurred outdoors.

Field Audit Session

This section should be filled out by a certified trainer ONLY if a Field Audit Session was conducted. Field Audit Sessions are required at a minimum every two years.

Legible Trainer Full Name:_____ Trainer Signature:_____

Trainer Comments:

_____

_____

The Meadows Center for Water and the Environment
Texas State University

Texas Stream Team

ADVANCED FIELD GUIDE – NITRATE-NITROGEN & TURBIDITY

Please note, instructions include the new turbidity method. Email TxStreamTeam@txstate.edu if you need to upgrade to the new turbidity method.

TURBIDITY

Equipment Needed:

- Turbidity Tube (60 cm or 120 cm)
- Bucket (optional)

Testing Procedures:

PROCEED ONLY IF IT IS SAFE TO GET IN THE WATER.

1. Rinse bucket and tube twice with sample water before each use.
2. Standing in the centroid of the waterbody and downstream of the tube, dip the tube into the water facing upstream to fill it with water, being careful not to disturb the streambed or kick up any sediment.
    a. If you cannot access the centroid of flow, or it is not safe to get in the water, you can use a bucket to collect sample water and pour into the tube. Be careful not to disturb the streambed or kick up any sediment. Carefully pour the water collected in the bucket into the tube immediately after collection to prevent settling of suspended materials.
3. Hold the tube vertically, look down the tube to see if the disk at the bottom of the tube is visible. If you can see the disk, record the water level in meters on the monitoring form.
    a. If the tube is filled to the top and the disk is completely visible, record the measurement as > the maximum tube length (i.e., >1.2m or >0.6m).
4. If you are unable to see the disk, release water from the tube until the disk becomes visible. Record the water level in meters at which the disk becomes barely visible on your monitoring form.
5. Use the table below to convert your reading from meters to nephelometric turbidity units (NTUs). Record the value on your monitoring form.

Distance from bottom of tube (m)	NTU	Distance from bottom of tube (m)	NTU
<0.0625	>240	0.2875 to 0.3125	24
0.0625 to 0.07	240	0.3125 to 0.3375	21
0.07 to 0.08	185	0.3375 to 0.3625	19
0.08 to 0.095	150	0.3625 to 0.3875	17
0.095 to 0.105	120	0.3875 to 0.4125	15
0.105 to 0.12	100	0.4125 to 0.4375	14
0.12 to 0.1375	90	0.4375 to 0.4625	13
0.1375 to 0.1625	65	0.4625 to 0.4875	12
0.1625 to 0.1875	50	0.4875 to 0.5125	11
0.1875 to 0.2125	40	0.5125 to 0.5375	10
0.2125 to 0.2375	35	0.5375 to 0.575	9
0.2375 to 0.2625	30	0.575 to 0.6	8
0.2625 to 0.2875	27	> 0.6	<8

Source: Wyoming Stream Team, Conversion chart converting centimeters (cm) to turbidity units (NTU's).

NITRATE-NITROGEN

Equipment:

- 2 mixing bottles with caps
- Deionized (DI) water
- 1 2.5-10 mL test tube with cap
- 1 Nitrate #1 tablet
- 1 Nitrate #2 CTA tablet*
- Pipette
- Protective Sleeve
- Nitrate-Nitrogen Octa-Slide 2 Bar, 0-15 ppm
- Octa-Slide 2 Viewer
- Waste container/bucket
- Gloves or hand sanitizer

***Nitrate #2 Tablets are sensitive to UV light. Use the protective sleeve to protect the tablets and sample water if testing outdoors only.**

Sample Preservation & Holding Times

Testing should occur immediately following sample collection. However, if transportation is necessary, samples should be transported on ice. Samples can be stored for up to 48 hours at 4°C.

Testing Procedures

1. Put on gloves or hand sanitizer.
2. Rinse test tube and pipette twice with sample water; deposit rinse water into waste container.
3. Using a pipette, fill test tube to the 5 mL line with sample water.
4. Add 1 Nitrate #1 Tablet directly into the test tube with 5 mL of sample water without touching it with your hands/fingers. See instructions and diagram on box with tablets.
5. Cap the test tube and invert until the tablet disintegrates.
6. Add 1 Nitrate #2 Tablet to the test tube the same way you did in step 5 above. Immediately slide the test tube into the Protective Sleeve if testing outdoors.
7. Cap and invert for 2 minutes until tablet disintegrates.
8. Wait 5 minutes. Insert the Nitrate-Nitrogen Octa-Slide 2 Bar into Octa-Slide 2 Viewer while you wait.
9. After 5 minutes remove the test tube from the protective sleeve. Insert the test tube into the Octa-Slide 2 Viewer.
10. Match the resulting sample color to a color standard and record as ppm (mg/L) on your monitoring form.
11. Dispose of all waste into the waste container and rinse the test tube and cap twice with DI water before storing in kit.

The preparation of this publication is financed and prepared in cooperation through grants from the U.S. Environmental Protection Agency through the Texas Commission on Environmental Quality. Revised February 2, 2022.

The Meadows Center for Water and the Environment
Texas State University

Texas Stream Team

ADVANCED FIELD GUIDE - ORTHOPHOSPHATE

Equipment Needed:

- Hach Phosphorus, Orthophosphate (Reactive) Test Kit (Model #PO-19 and PO-19A)
- Deionized (DI) water
- Waste container/bucket
- Gloves or hand sanitizer
- Sample Bottles, square, with 10, 15, 20, and 23-mL marks
- PhosVer® 3 Phosphate Reagent Powder Pillows
- Long-path adapter
- Filtration Aid Solution
- Filter Paper, pleated, 12.5 cm
- Plastic Analytical Funnel
- Color Comparator Box
- Color Disc, Phosphate, 0 – 50 mg/L
- Color Viewing Tube
- Dropper

Sample Preservation and Holding Times

Test water samples for orthophosphates as soon as possible following sample collection. However, if transporting a sample is necessary because of poor weather or other extreme conditions, samples should be placed on ice during transport, and they can also be frozen at or below -10°C for up to 48 hours. If the sample is turbid, it should be filtered before transport whenever possible (see filtration instructions below).

Filtration

Note: Filtration must be performed if you recorded either “cloudy” or “turbid” on the Field Observations section of the monitoring form under Water Clarity. If the sample is clear, proceed to the *Analysis* section without filtering.

1. Put on gloves or hand sanitizer.
2. Rinse both sample bottles twice with sample water; deposit rinse water into waste container.
3. Fill a sample bottle to the shoulder with sample water.
4. Add 1 drop of Filtration Aid Solution; swirl to mix.
5. Put the filter paper in the funnel, and place on a second bottle.
6. Pour the sample from the first bottle into the funnel.
7. Use the filtered sample in the testing procedures below.

Analysis

When testing for orthophosphates, always begin with the low range test. If the color match is between two segments on the color disc, use the value that is halfway between the two segments.

Low Range (0-0.8 mg/L)

1. Put on gloves or hand sanitizer.
2. Install the long-path adapter into the color comparator box.
3. Rinse both tubes, square bottles, and caps with sample water twice.
4. Fill a tube to the top line (15 mL) with sample water.
5. Put the tube into the left opening of the color compactor box.
6. Fill a square bottle to the 20 mL mark with sample water.
7. Add 1 PhosVer 3 Reagent Powder Pillow to bottle, swirl to mix.
8. Wait 8 minutes. Read the results within 10 minutes.
9. Fill a second tube to the top line with the prepared sample.
10. Put the second tube into the color comparator box.
11. Hold the color comparator box in front of a light source. Turn the color disc to find the color match.
12. If you can read a result from the low-range test, do not proceed to the mid or high range tests. Read the value in the scale window of the second tube with prepared sample water. Divide the value by 50 to get the result in mg/L. Record on your monitoring form.
    a. If a color match is not possible due to the sample being darker than the darkest value on the color wheel, proceed to the mid-range test.

13. Dispose of all waste in waste container and rinse the test tubes, bottles, and caps twice with DI water.

Mid-Range (0-4 mg/L)

1. Remove the long-path adapter from the color comparator box.
2. Rinse the tubes with sample water twice.
3. Fill 2 tubes to the first line (5 mL) with sample water.
4. Put 1 tube into the left opening of the color comparator box.
5. Add 1 PhosVer 3 Reagent Powder Pillow to the second tube. Swirl to mix, a blue color develops.
6. Wait 1 minute. Read results within 5 minutes.
7. Put the second tube into the color comparator box.
8. Hold the color comparator in front of a light source. Turn the color disc to find the color match.
9. If you can read a result from the mid-range test, do not proceed to the high-range test. Read the value in the scale window. Divide the value by 10 to get the result in mg/L. Record on your monitoring form.
    a. If a color match is not possible due to the sample being darker than the darkest value on the color wheel, proceed to the high-range test.
10. Dispose of all waste in waste container and rinse the test tubes, bottles, and caps twice with DI water.

High Range (0-40 mg/L)

1. The long-path adapter stays removed.
2. Rinse the tubes with sample water twice.
3. Fill 1 tube to the first line (5 mL) with DI water.
4. Put the tube into the left opening of the color comparator box.
5. Rinse the dropper twice with sample water.
6. Use the dropper to add 0.5 mL of sample water into a second tube, then;
7. Add DI water to the first line (5 mL) on the second tube.
8. Add 1 PhosVer 3 Phosphate Reagent Powder Pillow to the second tube. Swirl to mix, a blue color develops.
9. Wait 1 minute. Read the results within 5 minutes.
10. Put the second tube into the color comparator box.
11. Hold the color comparator box in front of a light source. Turn the color disc to find the color match.
12. Read the results in mg/L in the scale window. Record on your monitoring form.
13. Dispose of all waste in waste container and rinse the test tubes, bottles, and caps twice with DI water.

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The Meadows Center for Water and the Environment
Texas State University

Texas Stream Team
ADVANCED FIELD GUIDE – STREAMFLOW ESTIMATE

Equipment Needed:

- Yard or meterstick (make sure it has standard units on at least 1 side)
- Timer such as a stopwatch, cell phone or wristwatch with timer capability.
- Whiffle Ball or other floating object such as a rubber duck, stick, leaf, etc.
- 1 tape measure (2 if monitoring alone)
- Water shoes/sandals or waders.

Before Heading Out

Check if your monitoring site is within 0.25 mile of a stream gauge. You can check the United States Geological Society, International Boundary and Water Commission's, or your local river authority to see a list of flow gauging stations. Measure the distance from your monitoring station using free software such as Google Earth, implementing the measurement tool. If your monitoring site is within 0.25 miles downstream of a gauge, record the gauge reading from the approximate time you conducted your monitoring event. Record the flow value and method on your monitoring form. If the nearest gauge is >0.25 miles upstream of your monitoring site, proceed with the method below to estimate streamflow.

Safety Notice

Never measure streamflow in swiftly moving or deep water, or in hazardous weather conditions. Take a buddy with you for safety purposes if possible. If you are concerned for your safety, do not conduct streamflow monitoring.

Procedures

1. Select a cross section of the waterbody to measure, avoiding pools, ripples, backflows, etc., that would impact the waterbody's true flow. Choose a section between 5 – 20 feet wide if possible.
2. Measure the width of the waterbody in feet. Measure only the water from the edge of the left bank to the edge of the right bank. Round to the nearest 1/4th inch.
3. Measure the depth of the water body at the midpoint of the 2 feet wide increments. Average the depth measurements and notate on your monitoring form.
4. Measure 10 feet downstream (following the current) at the centroid of flow. If measuring with a buddy continue with step 5. If measuring alone, skip to step 6 for specific instructions.
5. Have one person stand upstream (at the beginning of the 10-foot measurement), and the other downstream.
    a. The person upstream drops the whiffle ball or another floating object into the current.
    b. The person waiting downstream times how long it takes the object to travel 10 feet using the timer, then retrieves and returns the object to the starting point.
    c. Record the time on the monitoring form. Repeat the process 3 times and average the recorded times.
6. (Sampling alone only) Use the second tape measure to measure 10 feet downstream from the centroid of flow. Instead of a whiffle ball or other plastic floating device, use a dry stick or something from your natural surroundings that can float to prevent littering.
    a. Mark where the 10-foot measurement is downstream from the centroid. You can place a stick into the bed so that it is visible above the water surface, or stack rocks. Be sure to take down any rock stacks after completing the measurement.
    b. Standing upstream (at the beginning of the 10-foot measurement), drop your floating object into the current.
    c. Use the timer to time how long it takes the object to travel 10 feet.
    d. Record the time on the monitoring form. Repeat the process 3 times and average the recorded times.
7. Divide the distance (10 ft) by the average time to calculate the average velocity.
    a. Average Velocity (ft/sec) = 10 (ft) ÷ Average Time (sec).
8. Calculate and record the discharge in cubic feet per second (cfs).
    a. Discharge (cfs) = Width of Waterbody (ft) x Average Depth (ft) x Average Velocity (ft/sec).

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