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

Texas Stream Team

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

CORE 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 # 1 0 0 0 1

Sample Depth (meters)
(not total depth)

Community Scientist's Name _____
Site Description Training
Group or Affiliation _____

Core monitoring type conducted ☐ Standard Core ☐ Probe Core ☐ Other

Instrument Calibration: Conducted within 24 hours of sampling. Store standard solutions and calibrate at room temperature.

Calibration	Date	Time	Standard Value	Standard Temp (°C)	Pre-Test Calibration Initial Reading	Calibrated To	Post-Test Calibration Initial Reading
Conductivity/Salinity							
Dissolved Oxygen							
pH							

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)
- ☐ 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

Core Tests and Measurements:

- ☐ AIR TEMPERATURE (°C)
- ☐ SECCHI DISC TRANSPARENCY (meters)
  Average
  Disappears _____ Appears _____
- ☐ TOTAL DEPTH (meters)
- ☐ TRANSPARENCY TUBE (meters)
- ☐ WATER TEMPERATURE (°C)
- ☐ DISSOLVED OXYGEN (mg/L)
  Average 1st titration _____ 2nd titration _____
- ☐ CONDUCTIVITY (µS/cm)
- ☐ pH (standard units)

Coastal Area Salinity Tests and Observations:

☐ SALINITY (ppth) ☐ TIDE STAGE: 1-low 2-falling 3-slack 4-rising 5-high

Comments:

_____

_____

_____

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 COMMUNITY SCIENTIST'S SIGNATURE DATE

Prepared in cooperation with the Texas Commission on Environmental Quality and the United States Environmental Protection Agency.
Revised February 7, 2024.

CORE FIELD QUALITY CONTROL CHECKLIST

Community 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 community 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

- ☐ Gloves were worn or hand sanitizer was applied throughout.
- ☐ No chemical reagents used for testing were expired and all chemical reagents were stored 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. Monitoring sample was collected from the centroid of flow with minimal streambed disturbance.
- ☐ All equipment was rinsed 2X with sample water before the test was conducted.
- ☐ All equipment was rinsed 2X with deionized water after testing was conducted.

Field Observations

- ☐ **Algae:** Recorded algae observed on 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 at least one cloud in the sky.

Instrument Calibration

- ☐ The instruments/meters were calibrated within 24 hours of monitoring and conducted in a temperature-controlled environment.
- ☐ All meters were held in center of beaker not touching the bottom or sides and stirred for 2 minutes before recording the reading.
- ☐ All meters were turned on/off while submerged in solution.
- ☐ Meters were rinsed with DI water and caps were replaced immediately after use.
- ☐ Pre- and post-test calibration were conducted and the difference between the "Calibrated To" value of the pre-test calibration and "Post-Test Calibration Initial Reading" is within the error limit listed below for each parameter:

Parameter	Error limit
Conductivity	± 20% of calibration standard solution
Salinity	± 1 ppt
Dissolved Oxygen (Standard Core)	± 0.5 mg/L
Dissolved Oxygen (Probe Core)	± 6% saturation
pH (Probe Core only)	± 0.5 s.u.

Core Tests and Measurements

- ☐ **Sample Depth:** The sample depth is either 0.3 m or 1/3 of the total depth.
- ☐ **Air Temperature:** Thermometer placed in shade.
- ☐ **Transparency Tube:** Be careful to not scrape the streambed or distrub or kick up sediment.
- ☐ **Secchi Disc Transparency:** Secchi lowered in water shadded from the sun. Record average then lower to bottom to get total depth reading.
- ☐ **Water Temperature:** If using thermometer, air temperature was measured first.

Dissolved Oxygen:

- ☐ Bottles rinsed 2X with sample water and titration vials rinsed 2X with fixed solution.
- ☐ Bottles filled so the meniscus is resting on the line.
- ☐ Lids capped underwater with no air bubbles.
- ☐ Duplicate sample conducted and titration values within 0.5 mg/L of each other.
- ☐ Chemical reagent bottles completely inverted when adding drops to prevent interference from air bubbles.

pH:

- ☐ The pH vial cap was removed and the tube was held up against a white background before viewing.
- ☐ The amount of sample water needed in the test tube was determined based on the type of pH viewer being used.
- ☐ The test tube was filled so the meniscus is resting on the line.

Refractometer (tidaly-influenced saltwater only)

- ☐ Time was allowed for the temperature of the sample water to stabilize before the salinity measurement was recorded.
- ☐ Instrument was held up to a light source when gathering the salinity measurement.

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:

_____

_____

PHASEII

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CORE 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 # 1 0 0 0 1

Sample Depth (meters) _____
(not total depth)

Community Scientist's Name _____

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Dissolved Oxygen							
pH							

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Core Tests and Measurements:

☐ AIR TEMPERATURE (°C)

☐ SECCHI DISC TRANSPARENCY (meters)
Average
Disappears _____ Appears _____

☐ TOTAL DEPTH (meters)

☐ TRANSPARENCY TUBE (meters)

☐ WATER TEMPERATURE (°C)

☐ DISSOLVED OXYGEN (mg/L)
Average 1st titration _____ 2nd titration _____

☐ CONDUCTIVITY (µS/cm)

☐ pH (standard units)

Coastal Area Salinity Tests and Observations:

☐ SALINITY (ppth)

☐ TIDE STAGE: 1-low 2-falling 3-slack 4-rising 5-high

Comments:

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pH:

- ☐ The pH vial cap was removed and the tube was held up against a white background before viewing.
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- ☐ The test tube was filled so the meniscus is resting on the line.

Refractometer (tidaly-influenced saltwater only)

- ☐ Time was allowed for the temperature of the sample water to stabilize before the salinity measurement was recorded.
- ☐ Instrument was held up to a light source when gathering the salinity measurement.

Field Audit Session

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Legible Trainer Full Name: _____ Trainer Signature: _____

Trainer Comments:

_____

_____

PHASE III

For Phase III you will conduct the protocols without a trainer and enter all your data into the electronic Core Environmental Monitoring Form. Please follow the instructions below.

1. Open the form via the direct link, through the Texas Stream Team website, or scan the QR code to the right with your mobile device.
2. Begin filling out the form. Please note the following:
   - In the Site ID - Description field, open the dropdown menu and select **10001 - Training** (it will be the first option - this should be selected for trainings only)
   - Fields marked with a red asterisk (*) must be entered to submit the form.
   - Certain fields will be required and appear based on the answers to prior fields. It is recommended to fill out the form in the order presented to ensure all relevant questions are visible.
3. When all required questions have been answered, click Submit. A message appears indicating that your data was sent successfully.
4. Moving forward, the electronic Core Environmental Monitoring Form will be used to submit your data directly to Texas Stream Team. Be sure to have the link ready when you begin monitoring and make sure to input your monitoirng site ID and description into the Site ID - Description field (not the 10001-Training option).
5. For questions or assitance, contact Texas Stream Team at TxStreamTeam@txstate.edu or 512-245-1346.

The Meadows Center for Water and the Environment
Texas State University

Texas Stream Team

STANDARD CORE FIELD GUIDE – MONITORING PROCEDURES

Please note, instructions include the new TRACER gray conductivity meter. Email TxStreamTeam@txstate.edu if you need to upgrade your meter.

Equipment Needed

- Standard Core Kit (with unexpired reagents)
- Bucket
- Deionized (DI) Water
- Waste Bin
- Gloves or Hand Sanitizer
- Conductivity Standard Solution (600 or 1413 µS)
- Transparency Tube (optional for shallow water)

At Site

1. Record *Field Observations* and *Comments* on Core Environmental Monitoring Form.

2. Hang thermometer out of direct sunlight, wait 2-3 minutes; record *Air Temperature* to nearest 0.5°C.

3. Measure *Transparency* by selecting a method below that is most applicable to your monitoring site:

A. *Secchi Disc Transparency* for deeper water, lower Secchi disc until it disappears, mark depth, then raise Secchi disc until barely visible, and mark depth again. Average depth readings and record to nearest 0.1 m.

B. *Transparency Tube* for shallow water:

1. Rinse bucket and tube 2X with sample water.
2. Standing in the centroid of flow of the waterbody and downstream of the tube, dip the tube into the water facing upstream to fill.
   a. If centroid is not accessible, or the waterbody is unsafe to stand in, use a bucket to collect sample water and pour into the tube immediately after collection to prevent settling of suspended materials.
3. Holding the tube vertically, look down the tube to see if the disc at the bottom is visible. If disc is not visible, release water until visible and record the water level in meters on Monitoring Form.
   a. If the tube is filled to the top and the disc is completely visible, record the measurement as > the maximum tube length (>1.2 m or >0.6 m).

4. Measure *Total Depth* by lowering Secchi disc into water until cord becomes slack, then raise until straight. Mark and record to 0.1 m.

5. Conduct bucket grab, rinse bucket 2X with sample water and discard water downstream.

6. Measure *Water Temperature* in the bucket sample with thermometer for 1-1/2 minutes. Read thermometer while in water to the nearest 0.5°C.

Dissolved Oxygen (DO)

Measurement (Titration Method)

1. Rinse 2 sample bottles and caps 2X with sample water.

2. Fill each bottle with sample water and cap below sample water surface, check for air bubbles.

Fixing the DO Sample:

1. Add 8 drops Manganous Sulfate Solution to each bottle. The bottle will overflow slightly.

2. Add 8 drops Alkaline Potassium Iodide Azide. Cap both bottles, slowly invert 25 times. Allow precipitate to settle below the shoulder of the bottles, then invert 10 more times and allow settling again.

3. Add 8 drops Sulfuric Acid. Cap both bottles and slowly invert for minimum of 3 minutes or until reagent and precipitate dissolve. Sample is now "Fixed" and can be finished at home within 4 hours if weather or other conditions warrant.

Titrating the DO Sample:

1. Rinse 1 vial 2X with a small volume of fixed solution from sample #1. Fill vial with fixed solution from sample #1 to 20 mL line and cap. Repeat for sample #2 and set aside.

2. Ensure pink titrator tip is in place and fill titrator with Sodium Thiosulfate – the plunger ring should be at 0.0. Expel air bubbles from titrator barrel. Place titrator into hole on vial cap. Add 1 drop at a time of titrator solution to vial and swirl to mix after each drop until the yellow-brown solution turns a pale yellow or straw color.

3. Uncap vial with titrator STILL INSERTED and keep tip suspended above mouth of vial. Add 8 drops of Starch Indicator Solution, cap vial, swirl to mix.

4. Continue titration drops and swirls, 1 drop at a time, until the solution becomes clear. Check against white background for any remaining color.

5. Read and record total number of units at plunger ring to nearest 0.1 mg/L under *1st titration.* Eject remainder of titrator solution into vial and dispose of vial solution in waste container.

6. Repeat titration process (Steps 1-5) with fixed solution for sample #2 and record these results under *2nd titration.* The second result must be within 0.5 mg/L of the 1st titration, if not repeat steps 1-5 for sample #1. If error limit still isn't met repeat steps 1-5 for sample #2. If repeating steps 1-5 for both samples doesn't meet the error limit, collect a new bucket grab and start over from the beginning with step #1.

7. Calculate the average of both titration results to nearest 0.1 mg/L and record under *Dissolved Oxygen*.

8. Rinse DO bottles, titration vials, and caps 2X with DI water.

Conductivity

Record the Conductivity Standard Solution value under *Standard Value* in the *Conductivity/Salinity* row on Monitoring Form.

Pre-Test Calibration

1. Rinse beaker and meter 2X with Conductivity Standard Solution.

2. Fill beaker with 20-50 mL of conductivity solution, insert meter and stir gently to remove bubbles from probe.

3. Turn meter on WHILE SUBMERGED and slowly stir for 2 minutes.

4. Make sure the meter is in conductivity mode. A small "µS" (microsiemens) symbol will appear. If meter is not in µS, press and hold the MODE button and toggle through until "µS" is displayed.

5. Record the *Standard Temperature* and *Pre-Test Calibration Initial Reading* on the Monitoring Form.

6. Press and hold the CAL button until "CAL" appears in the lower display. Release button. When calibration is complete, the meter automatically displays "SA," then "End" and returns to normal operation mode. The meter is now calibrated and should display the calibration Standard value. Record the Standard value under *Calibrated To* on Monitoring Form.

7. Rinse beaker and meter 2X with DI water.

Measurement

1. Rinse beaker and meter 2X with sample water.

2. Fill beaker with 20-50 mL of sample water, insert meter, and remove bubbles. Turn meter on and stir gently for 2 minutes. Stop stirring, hold meter 1/2 inch off bottom and sides, record reading under *Conductivity (µS/cm)*.

3. Turn meter off while submerged and rinse 2X with DI water.

Post-Test Calibration

1. Rinse beaker and meter 2X with Conductivity Standard Solution.

2. Fill beaker with 20-50 mL, insert meter, and remove bubbles. Turn meter on and stir gently for 2 minutes. Stop stirring, hold meter ½ inch off bottom and sides, record reading under *Post-Test Calibration Initial Reading* on Monitoring Form. The difference between the *Calibrated To* value and the *Post-Test Calibration Initial Reading* should fall within ±20% of the calibration standard solution error limit.

3. Turn meter off while submerged, rinse 2X with DI water, and replace cap.

pH

Measurement

1. Rinse 1 test tube and cap 2X with sample water.

2. Determine the type of pH viewer you are using:
   A. If using the Octet Comparator (2193 and/or 2196) or the Liquid Wide Range pH Viewer (2192), fill round test tube with sample water to the 5 mL indicator line.
   B. If using the Octa-Slide 2 Viewer (1101) with color bars (2196-01 and 2193-01) fill the square test tube with sample water to the 10 mL line.

3. Invert pH Wide Range Indicator bottle a few times to mix, add 10 drops to sample, cap tube, and invert 10 times.

4. Insert the tube in Color Comparator Viewer, remove cap, and hold up to white background. Estimate to nearest 0.1 s.u. and record under *pH*.

5. Rinse tube and cap 2X with DI water.

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 7, 2024.