

CRJC Wantastiquet Subcommittee
 Agenda
 Wednesday, May 6, 2020
 5 PM
 Conference Call

CRJC's mission is to preserve the visual and ecological integrity and sustainable working landscape of the Connecticut River Valley, and guide its growth and development through grassroots leadership. Five local river subcommittees carry out this work with a corps of over 100 volunteers.

Attendees

Walpole	Samantha Loch		Westminster	Paul Harlow	
Walpole			Westminster	Jim Calchera	
Westmoreland	Perry Sawyer	X	Putney	Joe Grutta	X
Westmoreland			Putney		
Chesterfield	Roland Volbehr		Dummerston	Daniel Marx	
Chesterfield			Dummerston	Jack Lilly	
Hinsdale			Brattleboro	Kathy Urffer	X
Hinsdale			Brattleboro	Michael Fairchild	
Vernon	Andy White		Brattleboro (alt)	Michael Donovan	
Vernon					

Darlene Conca (Permit Applicant, West Chesterfield)
 Margo Ghia (Windham Regional Commission, Planner)
 Ryan O'Donnell (CRC)
 Ed Smith (CRJC Commissioner)
 Michele Condon (NHDES)
 Olivia Uyizeye (Staff)

No Quorum Present

Agenda

Start: 510pm

1. Review of Conference Call Tools and Public Meeting Guidelines

Uyizeye started the meeting at 510pm. Attendees were oriented to zoom conference call features (mute, raise hand, chat room) and how to request technical support.

Attendees introduced themselves.

2. Volunteer River Assessment Program Training
 Speaker & Trainer: Michele Condon, NH Department of Environmental Services

Uyizeye introduced Condon who shared her screen for the presentation. Please see the attached presentation slides, protocols, and additional comments just below. Condon discussed

- Protocols will be shared and have full details for reference when in the field and sampling
- Coordination needed to pass off equipment
- Reviews data sheets: Sections to fill out – name/date, weather conditions, samples sent to lab
- Reviews role of QA/QC and tasks performed for this purpose
- Runs through use of each meter and corresponding test (full details in the protocol)
- Reviews safety procedures, including modifications for COVID 19
- Questions
 - o Uizeye. Equipment challenges?
 - o Condon. Give a call to Michele, if need be it is possible to coordinate a way to get the meter checked
 - o Ghia. How frequent is monitoring? Does it change depending on river?
 - o Condon. For VRAP, it depends on group an capacity. Many do it once a month.
 - o Urffer. Since we need to pick up, sample and drop off equipment – how long can we have equipment out for?
 - o Condon. There is a set of equipment that the team can use all summer, no need to go back and forth to Concord.
 - o Urffer. What about the data sheets? Do we pass off as we go?
 - o Condon. This is flexible. You can send as you go through pdfs or drop it off at the end of the season with the equipment. Always good to take pictures in case something gets lost.
 - o Urffer. What about the chloride samples that need lab analysis?
 - o Condon. Can hold for 1-2 weeks. Can provide team with chloride bottles if desired. 28 day holding time.
 - o Urffer. We need a team of 2 that goes out monthly. Urffer says she is willing to go out and be one of these people. Idea to do this as a pilot – see how it goes, how hard or easy, and then share this information with other subcommittees.
 - o Grutta. Originally had thought about involving the Brattleboro high school. Grutta says he can devote one day a month for this.
 - o Urffer. 6 sites in total. The Northfield site is a station done by DES. Could do a subset, if that is more feasible. Any recommendation on how to handle for a river as large as the Connecticut?
 - o Condon. The bucket needs to collect water only just at the surface of the water in the middle of the channel, At the top of the water column.
 - o Grutta. How big is the bucket?
 - o Condon. 5 gallon. Can be pretty heavy. But you do not have to fill up fully.
 - o O'Donnell. Ease can change depending on the railing. If it's a high railing that can be more difficult.
 - o Condon. It might be worth checking the sites out first.
 - o Sawyer. Vilas Bridge sometimes the water can be low or even dry.

- Urffer. Vilas Bridge is important because of the relicensing process. There might be changes due to how the dam is being run, which can be helpful to track any changes or lack of changes.
- Urffer. Waste water treatment plant is already doing some testing from what we learned at the site visit.
- Sawyer. Near the county farm is one of the deepest spots. They might only do intake or output, not both.
- Grutta. It would be good to have a 3rd person or a second team. Scheduling out in advance will be helpful. We can at least get it started.
- Urffer. If we schedule it for the summer, then folks can drop in, learn how to do it. Asks Ryan to share about other sampling done with Greenfield and sampling done through VT, including e-coli.
- O'Donnell. Won't know about e-coli until know whether lab will be open for the season in Greenfield, expected decision on June 1. Coordinates the WQ monitoring program for the Deerfield monitoring program, which is also in both states of NH and VT. E-coli only have a 6 hour holding time. CRC has a few credits running and trading on e-coli with the state. Using credits to do nutrient monitoring programs. Right now the program is on hold and will not be increasing credits. Activity in VT still remains to be seen, right now accepting no outside samples. In a normal year we are doing a lot of sampling all over the watershed. Looking to add some tests, as we lose access to the state lab.
- Urffer. What do you need from us to start?
- Condon. I can have it ready next week and schedule a time to pick up.
- Urffer. Agrees to follow up for pickup.

3. Business Meeting

Postponed due to lack of quorum.

4. Adjourn

Meeting ended 6:30pm

Minutes respectfully submitted by Olivia Uyizeye



VRAP TRAINING

May 6th, 2020

CRJC Wantastiquet Meeting

Michele Condon, New Hampshire Department of Environmental Services

What is VRAP?

- Volunteer River Assessment Program
- Established in 1998 to promote awareness of the importance of maintaining water quality and improving the water quality monitoring coverage of New Hampshire's rivers and streams
- New Hampshire Department of Environmental Services (NHDES) Watershed Bureau staff work with volunteers to conduct water quality monitoring
- 2019
 - 28 groups with ~100 volunteers
 - ~6,000 individual water quality samples

Purpose

- Volunteers learn how to use water quality monitoring equipment, proper QA/QC, sampling techniques while they enjoy the NH's rivers and streams in their backyard
- Assist NHDES in monitoring NH's rivers and streams for the 305(b) & 303(d) assessments
 - Over 40% of the surface water quality assessments of riverine assessment units included in the 2018 - 305(b) & 303(d) assessment reports were provided by the VRAP program

Equipment



- Turbidity meter
- YSI meter
- pH meter
- Bucket with rope attached
- Water collection bottles (labeled)
- Field data sheet with pencil
- Kim wipes
- Standards
- Graduated cylinder
- DI Water

Weather: Clear Cloudy w/o Rain Intermittent Rain Cloudy w/Rain Snow Snowmelt

Wind: Calm Breeze Wind

Rain Past 3 Days? Yes No Unknown

Air Temperature (°F): Below 30 30s 40s 50s 60s 70s 80s 90s Above 90s

Water Level: Dry Very Low Below Average Average Above Average High

Comments: (ie: swimmers, water color, algae, etc.) Please indicate NHDES Station ID.

Laboratory Samples: Please list stations where lab parameters were taken. Check all parameters taken at each station. Be sure to list if replicates were taken.

Lab: Where the samples were relinquished to? NHDES PSU UNH EAI Other:

Station ID	Parameter 1	Parameter 2	Parameter 3	Parameter 4
	Chloride	E.coli	Total Phosphorous (TP)	Other:

End of Day Checklist:
(Check if Completed)

All Meters:

Dry & powered off _____

Turbidity:

Rinse sample vial & fill with DI water _____

pH:

Rinse probe with DI water & blot dry _____

Return probe to storage solution _____

YSI:

Rinse probe with DI water _____

Return probe in chamber _____

Equipment Kit:

Remove used Kim wipes _____

Clean off dirt, dust and moisture _____

Please return data sheets to:

Michele Condon

NH Volunteer River Assessment Program

29 Hazen Drive- PO Box 95

Concord, NH 03302-0095

603-271-6949

Michele.Condon@des.nh.gov

OFFICE USE ONLY:

Activity Date: _____

Date Entered: _____ By: _____

Date Proofed: _____ By: _____

Date QA/QC: _____ By: _____

Weather: Clear Cloudy w/o Rain Intermittent Rain Cloudy w/Rain Snow Snowmelt

Wind: Calm Breeze Wind

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603-271-6949

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OFFICE USE ONLY:

Activity Date: _____

Date Entered: _____ By: _____

Date Proofed: _____ By: _____

Date QA/QC: _____ By: _____

QA/QC of Data

- QA/QC- Quality Assurance/Quality Control
- High quality data used in assessments
 - All QA/QC completed
- Things to remember!
 - Turn on YSI meter before you arrive at first site
 - Initial and end of the day checks
 - Calibrate for dissolved oxygen (DO) and pH at every station
 - QA/QC check at one station
 - One replicate per day

Turbidity Meter

- Initial check (1.0 NTU)
- Calibration (1.0 NTU)
- Water sample
- QA/QC Check (0.0 NTU)
- End of day check (1.0 NTU)



Turbidity Meter- Initial Check (1.0 NTU)



Turbidity Meter- Calibration (1.0 NTU)



Turbidity Meter- Water Sample



Turbidity Meter- QA/QC Check (o.o NTU)



Turbidity Meter- End Of The Day Check (1.0 NTU)



pH Meter

- Calibration before each station (4.0 and 7.0 buffer)
- Water sample
- QA/QC check (6.0 buffer)



pH Meter-Calibration (4.0 and 7.0)



pH Meter-Calibration (4.0 and 7.0)



pH Meter- Water Sample



pH Meter- QA/QC Check (6.o)



YSI Meter

- DO calibration before each station
- Initial conductivity check (2,000 $\mu\text{S}/\text{cm}$)
- Water sample (Water temperature, dissolved oxygen, specific conductance)
- End of day conductivity check (2,000 $\mu\text{S}/\text{cm}$)



YSI Meter- DO Calibration



YSI meter- DO Calibration



YSI Meter- Initial Conductivity Check (2,000 $\mu\text{S}/\text{cm}$)



YSI Meter- Water Sample



YSI Meter- End Of The Day Check (2,000 $\mu\text{S}/\text{cm}$)



Safety

- Always monitor with someone else
- Check weather
- Avoid wading in rivers with high flows
- Don't lean on unstable railing
- Watch out for rope
- COVID-19
 - NHDES closed to public
 - Outside bin for drop off
 - NHDES only excepting chloride samples
 - Use personal protective equipment (PPE)
 - Practice social distancing
 - Use separate cars
 - Assign one person to a meter/task or avoid hand to hand passing of equipment

THANK YOU! QUESTIONS?

Michele Condon, VRAP Assistant

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603-271-6949

Ted Walsh, VRAP Manager

ted.walsh@des.nh.gov

603-271-2083

Connecticut River Sampling and Assessment Project - Assessment Units & Stations

All parameters needed
Trend station; no data needed
Only pH and bacteria needed
Only bacteria needed

STATION	Station Location/Description	Assessment Unit ID's	Location of AU	Size	Fixed Station	Station Confirmed	Canoe Access to AU	Canoe Access Confirmed
102-CNT	4th Conn Lake	NHLAK801010101-03	4th CT Lake	2.5 acres	FOUPITD/FOUPIT-GEN	YES	Not possible	Not possible
100-CNT	Downstream of 4th CT Lake, Pittsburg	NHRIV801010101-01	4th CT Lake → 3rd CT Lake	1.9 miles	None/no roads or bridges	YES	Not needed	
98-CNT	3rd Conn. Lake	NHLAK801010101-02	3rd CT Lake	289 acres	THIPIT-GEN	YES	Boat ramp	YES
97-CNT	E.coli Station; 3rd CT Lake Boatramp	NHLAK801010101-02	3rd CT Lake	289 acres	THIPIT-GEN	YES	Boat ramp	YES
96-CNT	Downstream of 3rd CT Lake, Pittsburg	NHRIV801010101-02	3rd CT Lake → Upper Moose Falls Pond	2.8 miles	None; find access point along Route 3	YES	Not needed	
92-CNT	Upper Moose Falls Pond Boat Ramp	NHLAK801010101-04	Upper Moose Falls Pond	20 acres	None; sample as impoundment	YES	Boat ramp	YES
88-CNT	Route 3 Bridge, Pittsburg	NHRIV801010101-04	Moose Falls Dam → Scott Brook/2nd CT Lake	0.8 miles	None; new station on sidewalk off route 3	YES	Not needed	
86-CNT	2nd Conn. Lake	NHLAK801010101-01	2nd CT Lake	1286 acres	SECPIT-GEN/CONSPITD	YES	Boat ramp	YES
86-CNT	E.coli station; 2nd CT Lake Boat ramp	NHLAK801010101-01	2nd CT Lake	1286 acres	SECPIT-GEN/CONSPITD	YES	Boat ramp	
84-CNT	Magalloway Road Bridge, Pittsburg	NHRIV801010102-02	2nd CT Lake Dam → 1st CT Lake	3 miles	None; road off Rte 3 for new station	YES	Not needed	
82-CNT	First Conn. Lake	NHLAK801010102-02	1st CT Lake	2807 acres	CONFPITD/FIRPIT GEN	YES	Boat ramp	YES
81-CNT	E.coli station; 1st Lake Boat ramp	NHLAK801010102-02	1st CT Lake	2807 acres	CONFPITD/FIRPIT GEN	YES	Boat ramp	YES
80-CNT	Carr Ridge Road Bridge, Pittsburg	NHRIV801010104-01	1st CT Lake Dam → Lake Francis	2.5 miles	None; River Road for new station	YES	Not needed	
79-CNT	E.coli station; Lake Francis State Park Boat Ramp	NHLAK801010104-02	Lake Francis	2081 acres	FRACKD/FRACKL-GEN	YES	Boat ramp	YES
78-CNT	Lake Francis	NHLAK801010104-02	Lake Francis	2081 acres	FRACKD/FRACKL-GEN	YES	Boat ramp	YES
76-CNT	Route 145 Bridge	NHRIV801010203-04	Lake Francis → Confluence with Indian Stream	4.5	Route 145 Bridge	YES	Not needed	NA
75-CNT	Mountain Valley Road, Pittsburg	NHRIV801010203-04	Lake Francis → Confluence with Indian Stream	4.5	Route 145 Bridge	YES	Not needed	NA
74-CNT	Route 3 Bridge, Clarksville/Pitts townline	NHRIV801010203-07	Confluence w/ Indian Stream → Confluence with Bishop Brook	4.2 miles	74-CNT Route 3 Bridge	YES	Not needed	
73-CNT	Bridge Street Bridge, Stewartstown	NHRIV801010305-01	Confluence w/ Bishop Brook → Begin Canaan Dam Impoundment	2.1 mi	None; Bridge St. Bridge Stewartstown for new station	YES	Not needed	
72-CNT	Canaan Dam Railroad Bridge, Stewartstown	NHIMP801010305-01	Canaan Hydro Dam Impoundment	20 acres	72-CNT; Railroad Bridge	YES	72-CNT	YES
71-CNT	Main Street Bridge, West Stewartstown	NHRIV801010305-02	Canaan Hydro Dam → Confluence w/ Mohawk River, Colebrook	10 miles	71-CNT at top of AU; 70-CNT shoreline at Slave/Cole Townline or 69B @ Colebrook WWTF	71-CNT yes	71-CNT	YES
69-CNT	Bridge Street Bridge, Colebrook	NHRIV801010404-02	Confluence w/ Mohawk River, Colebrook → Confluence w/ Cone Brook, Columbia	8.8 miles	68-CNT Columbia Covered Bridge; 69-CNT is top of AU but just DS of WWTF	YES	68-CNT on NH side; 69-CNT easy on both sides	YES
68-CNT	Columbia Covered Bridge, Columbia	NHRIV801010404-02	Confluence w/ Mohawk River, Colebrook → Confluence w/ Cone Brook, Columbia	8.6 miles	68-CNT Columbia Covered Bridge; 69-CNT is top of AU but just DS of WWTF	YES	68-CNT on NH side; 69-CNT easy on both sides	YES
67D-CNT	Hydrolab Station 1/2 mi upstream from Rte 105 Bridge	NHRIV801010405-03	Confluence w/ Cone Brook → Confluence with Nulhegan River, North Stratford	6 miles	67-CNT; Route 105 Bridge	YES	Not Needed	NA
67-CNT	Route 105 Bridge, North Stratford	NHRIV801010405-03	Confluence w/ Cone Brook → Confluence with Nulhegan River, North Stratford	6 miles	67-CNT; Route 105 Bridge	YES	Not needed	NO
64-CNT	Former Maidstone Bridge	NHRIV801010603-05	Confluence w/ Nulhegan River → Confluence w/ Upper Ammonosuc, Northumberland	19 miles	64-CNT; Maidstone Bridge does not exist	YES	Not needed; hang from former bridge	NO
61-CNT	Guildhall Bridge, Northumberland	NHRIV801010902-02	Confluence w/ Upper Ammonosuc → 1/2 miles DS of Guildhall Bridge	3.7 miles	61-CNT; Guildhall Bridge	YES	Guildhall Bridge on VT side just downstream of border	YES
58-CNT	Route 2 Bridge, Lancaster	NHRIV801010902-03	1/2 mi DS of 61-CNT → Confluence w/ Israel River	9.3 miles	58-CNT; Route 2 Bridge	YES	Coastal Gas Station ramp	YES
56-CNT	Mt. Orne Covered Bridge, Lancaster	NHRIV801010903-02	Confluence w/ Israel River → 1/2 mi DS of 56-CNT	5.7 miles	56-CNT; Mt. Orne Covered Bridge off Rte 135	Yes; can't sample from bridge; canoe or shore	Can launch from US NH side	YES
55-CNT	Railroad Bridge @ Johns River, Dalton	NHIMP801030201-01	1/2 mi DS of 56-CNT → Gilman Dam Dalton	3800 acres/~5miles	55-CNT; RR Bridge-Dalton	YES	Dalton Cartop launch at 55-CNT	YES
53-CNT	Gilman Road Bridge	NHRIV801030201-02	Gilman Dam, Dalton → 1/2 mi DS of Dam	1/2 mile	53-CNT; Gilman Road, Dalton	YES	Can launch from DS VT side	Not needed
52-CNT	Moore Reservoir/Old Waterford Road Launch	NHLAK801030202-01	Moore Reservoir; 1/2 mile DS Gilman Dam → Moore Dam	3600 acres, ~9miles	MOOLTLBD, MOOLTL-GEN, and MOOLTAP	Not needed	Old Waterford Road Boat Ramp	YES
50-CNT	Route 18 Bridge, Littleton	NHRIV801030203-01	Moore Dam → Rte 93 Bridge	1 mile	50-CNT; Rte 18 Bndge	YES	Route 18 Bridge Boat launch	YES
49-CNT	Cornetford Reservoir	NHIMP801030203-01	Cornetford Reservoir; Rte 93 Bridge → Cornetford Storage Dam	1000 acres / ~6 miles	COMMON-GEN	YES; no fixed station just canoe	Canoe launch just above dam	YES
48-CNT	Cornetford Dam Tailrace, Monroe	NHRIV801030205-02	Cornetford Dam → 1 mi DS	1 mile	48-CNT; portage trail to just DS of dam	YES	Canoe launch just below dam	YES; may not be possible in high flows

47-CNT	Barnett Road Bridge, Monroe	NHIMP801030205-02	McIndoes Reservoir; 1 mi DS of Cornerford Dam -> McIndoes Dam	545 acres / ~ 6 miles	46-CNT McIndoes Road and 47 CNT Barnett Road Bridge	YES	Canoe launch just above dam	YES
46-CNT	Macindoes Falls Road Bridge, Monroe	NHIMP801030205-02	McIndoes Reservoir; 1 mi DS of Cornerford Dam -> Macindoes Dam	545 acres / ~ 6 miles	46-CNT McIndoes Road and 47 CNT Barnett Road Bridge	YES	Canoe launch just above dam	YES
45-CNT	Macindoes Dam Tairace, Monroe	NHIMP801030205-01-01	Tairace of McIndoes Dam; McIndoes Dam -> .75 mile DS of dam	10 acres / ~.7 miles	45-CNT; Portage trail to just DS of dam	YES	Canoe launch just below dam	YES; may not be possible in high flows
44-CNT	Dodge Falls Dam	NHIMP801030205-01-02	Dodge Falls Reservoir; .75 mi DS of McIndoes Dam -> Dodge Falls Dam; Bath	280 acres / ~ 3miles	Canoe access likely just above Dodge Falls Dam	NO	Canoe access likely just above Dodge Falls Dam	NO
43E-CNT	Route 135 Canoe access, Bath	NHRIV801030205-03	Dodge Falls Dam -> Confluence w/ Ammonousic River	4.5 miles	43E-CNT Access point off Route 135 just north of Ammonousic River Bridge	YES	SAME; 43E-CNT	YES
40-CNT	Newbury Road Bridge, Haverhill	NHRIV801030703-04	Confluence w/ Ammonousic River -> Confluence w/ Roaring Brook; Piermont	19 miles	40-CNT; Newbury Rd off Rte. 135	YES	Haverhill Bridge Access Point	NO
35-CNT	Route 25A Bridge, Orford	NHRIV801040205-06	Confluence w/ Roaring Brook -> Confluence w/ Clay Brook; Lyme	12 miles	35-CNT; Rte. 25A Br. to Fairlee	YES	Orford Boat Landing	NO
30-CNT	West Wheelock Street Bridge, Hanover	NHLAK801040402-03	Wilder Lake; Confluence w/ Clay Brook -> Wilder Dam; Lebanon	1760 acres / ~ 19 miles	30-CNT; West Wheelock St.-Hanover	YES	Wilder Boat Launch for deep spot. Dartmouth boat http://www.dartmouth.edu/~scs/cnt/	NO
28-CNT	Route 4 Bridge, West Lebanon	NHRIV801040402-13	Wilder Dam -> Confluence w/ White River	1.5 miles	28-CNT; Route 4 Bridge, Lebanon	YES	Lyman Point Park on VT side	YES
27-CNT	Railroad Bridge @ Blue Seal Feed, West Lebanon	NHRIV801060302-01	Confluence w/ White River -> Confluence w/ Mascoma River;	1.3 miles	27-CNT; RR Bridge; Lebanon	YES	Bascetta Park in Lebanon	NO
27-CNT	Route 89 behind Kmart	NHRIV801060302-05	Confluence w/ Mascoma River -> Confluence w/ Blow Me Down Brook	12.5 miles	Bucker from shore	YES	YES	YES
24-CNT	Sumner Falls	NHRIV801060302-05	Confluence w/ Mascoma River -> Confluence w/ Blow Me Down Brook	12.5 miles	Bucker from shore	YES	YES	YES
20M-CNT	North Star Canoe Launch	NHRIV801060305-12	Confluence w/ Blow Me Down Brook -> Confluence w/ Sugar River; Claremont	6.7 miles	20-CNT; Rte 103 Br; Claremont	YES	North Star Canoe Rentals; they gave permission	YES
20-CNT	Route 12/103 Bridge, Claremont	NHRIV801060305-12	Confluence w/ Blow Me Down Brook -> Confluence w/ Sugar River; Claremont	6.7 miles	20-CNT; Rte 103 Br; Claremont	YES	North Star Canoe Rentals; they gave permission	YES
15-CNT	Route 11 Bridge, Charlestown	NHRIV801060702-12	Confluence w/ Sugar River -> 1/4 mi DS of Rte. 11 Bridge; Charlestown	13 miles	15-CNT; Route 11 Bridge	YES	Hoyt's Landing on VT side	NO
13D-CNT	Arch Street Bridge, Walpole	NHIMP801060703-05	DS of Rte 11 Bridge -> Bellows Falls Dam	1720 acres / ~9 miles	13D-CNT; Arch St Bridge off Rte 12; just US of Dam	YES	Pine Street Ramp In Walpole	NO
13-CNT	Vilas Bridge, Walpole	NHRIV801070501-10-01	Bellows Falls Dam -> end of bypassed section of river	1/2 mile	13-CNT; Vilas Bridge-off Rte. 12	YES	NO CANOE POSSIBLE	
10-CNT	Route 123 Bridge, Walpole	NHRIV801070501-10-02	end of bypass -> Confluence w/ Houghton Brook; Walpole	7.5 miles	10-CNT; Rte 123 Bridge	YES	Ramp near Cold River confluence	NO
09-CNT	Cheshire County Jail just US of Partridge Brook	NHRIV801070502-06	Confluence w/ Houghton Brook -> Confluence w/ Partridge Brook; Westmoreland	4.5 miles	canoe access only	YES	Launch canoe from lagoon at jail	YES
07-CNT	Route 9 Bridge	NHRIV801070505-10	Confluence w/ Partridge Brook -> confluence with Black River	11 miles	07-CNT; Route 9 Bridge	YES	Old Ferry Road Brattleboro, VT	NO
04-CNT	Route 119 Bridge, Hinsdale	NHIMP801070507-01	1 mi DS of Rte 9 Bridge -> Vernon Dam; Hinsdale	2000 acres / ~ 8miles	Rte 119 Bridge; Hinsdale	YES	Prospect Street Ramp; Hinsdale	NO
01-CNT	Route 10 Bridge Northfield, MA	NHRIV802010501-05	Vernon Dam -> Route 10 Bridge; Northfield, MA.	6 miles	01-CNT Route 10 Bridge Northfield MA	YES	Ramp on Route 10 1/2 mile south of bridge	NO

Want



NHDES-W-07-023
RSA487:38



2020 Field Data Sheet

NH Volunteer River Assessment Program



VRAP Group: _____

Volunteers (First & Last Name): _____

Date: _____ / _____ / 2020

Time Dissolved Oxygen Meter Turned On: _____

Initial Meter Check

Conductivity (2,000 std): _____ (1,600-2,400 μ S)

Turbidity (1.0 std): _____ (+/- 0.25 NTU)

NHDES Station ID	Station Name Or Description	Time Sampled (HH:MM)	Turbidity (NTU)	pH Calibration Slope (95-105%)	pH (Units)	Dissolved Oxygen (Calibration Value)	Dissolved Oxygen (% sat. chamber reading)	Water Temp ($^{\circ}$ C)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)	Specific Conductance (μ S)
Replicate (Required Daily)											

QA/QC Meter Check Station: _____

6.0 pH Check: _____ (5.7 – 6.3)

Turbidity Blank (0.0 NTU) Check: _____

End of Day Meter Check

Conductivity (2,000 std): _____

Turbidity (1.0 std): _____

Please complete backside...

Weather: Clear Cloudy w/o Rain Intermittent Rain Cloudy w/Rain Snow Snowmelt

Wind: Calm Breeze Wind

Rain Past 3 Days? Yes No Unknown

Air Temperature (°F): Below 30 30s 40s 50s 60s 70s 80s 90s Above 90s

Water Level: Dry Very Low Below Average Average Above Average High

Comments: (ie: swimmers, water color, algae, etc.) Please indicate NHDES Station ID.

Laboratory Samples: Please list stations where lab parameters were taken. Check all parameters taken at each station. Be sure to list if replicates were taken.

Lab: Where the samples were relinquished to? NHDES PSU UNH EAI Other: _____

Station ID	Parameter 1	Parameter 2	Parameter 3	Parameter 4
	Chloride	E.coli	Total Phosphorous (TP)	Other:

End of Day Checklist:

(Check if Completed)

All Meters:

Dry & powered off _____

Turbidity:

Rinse sample vial & fill with DI water _____

pH:

Rinse probe with DI water & blot dry _____

Return probe to storage solution _____

YSI:

Rinse probe with DI water _____

Return probe in chamber _____

Equipment Kit:

Remove used Kim wipes _____

Clean off dirt, dust and moisture _____

Please return data sheets to:

Michele Condon

NH Volunteer River Assessment Program

29 Hazen Drive- PO Box 95

Concord, NH 03302-0095

603-271-6949

Michele.Condon@des.nh.gov

OFFICE USE ONLY:

Activity Date: _____

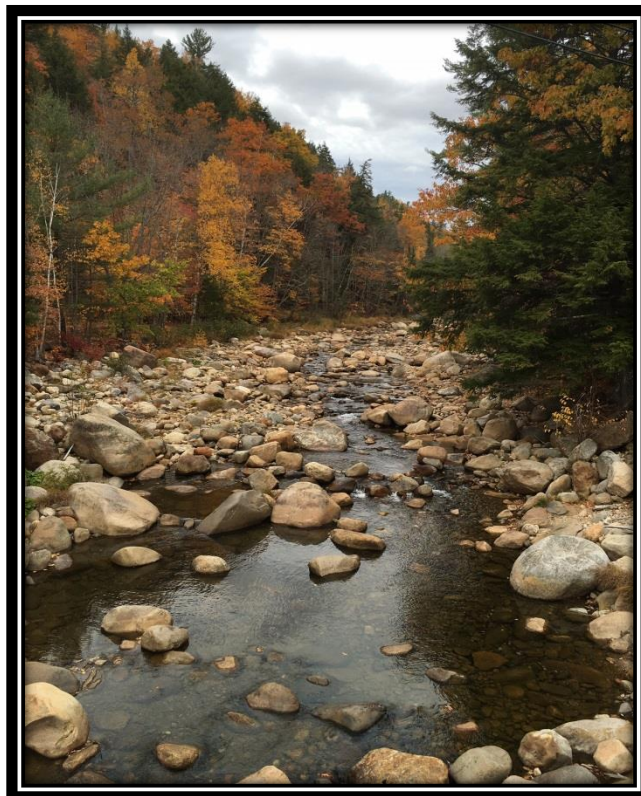
Date Entered: _____ By: _____

Date Proofed: _____ By: _____

Date QA/QC: _____ By: _____

NH Volunteer River Assessment Program (VRAP)

Water Quality Monitoring Sampling Protocols



East Branch Saco River Jackson, NH

New Hampshire Department of Environmental Services
29 Hazen Drive / PO Box 95
Concord, NH 03302-0095

Updated: January 2020

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INTRODUCTION

The Volunteer River Assessment Program (VRAP) is a program administered by the New Hampshire Department of Environmental Services (NHDES) that partners with volunteers to conduct water quality monitoring of New Hampshire's rivers and streams. Our rivers and streams receive drainage from watersheds that vary greatly in size, land-cover type, and levels of human activity. This creates diverse ambient surface water quality conditions throughout the state. These varying conditions have implications for the support of designated uses such as primary contact recreation (swimming) and the health of aquatic life. The ability of rivers and streams to support designated uses is measured through the VRAP relative to New Hampshire's surface water quality standards.

VRAP volunteers assess the physical, chemical and biological characteristics of the rivers and streams throughout the state. The data collected by volunteers is reported to NHDES and is evaluated by making comparisons to water quality standards and by making comparisons to established means and ranges of water quality throughout the state. The data collected by VRAP is used by NHDES for water quality assessment, education, and reporting purposes. The data are used by volunteer monitors for educational purposes, for guiding management and restoration efforts, and also for local watershed management.

New Hampshire has over 16,000 miles of rivers and streams and it is far beyond the capacity of NHDES to monitoring all of these waterbodies. VRAP was initiated in 1998 as a collaboration between NHDES and citizen scientists who are trained in water quality monitoring procedures to collect high quality data. Over 40% of the surface water quality assessments of riverine assessment units NHDES included in its 2015 Clean Water Act assessments were provided by the VRAP program!

These water quality monitoring protocols are intended as a guide to VRAP volunteers for all of the activities associated with water quality monitoring including how to operate water quality monitoring equipment, proper QA/QC procedures, processing of laboratory samples, sampling techniques, and safety in the field.

SAFETY IN THE FIELD

Safety is the first priority while conducting river and stream field monitoring. Please take note of the following safety precautions and if at any point, you feel uncomfortable, please terminate monitoring immediately.

- Always monitor with at least one other person. Never sample in the field without a partner.
- Look at the weather forecast before sampling, making sure no storms are approaching or flood warnings are in effect.
- Avoid wading into a river if the water is high or fast moving. In these conditions, sample from a bridge or from the shore.

In- Stream Safety

When it is necessary to wade into a stream to collect water samples:

1. Do not enter flowing water that is above your waist and be sure someone on shore knows where you are.
2. Always wear waders or waterproof wading boots.
3. Secure your footing with each step. River bottoms accumulate slippery algae on the rocks.
4. If you find that you're in fast flowing water up to your hips, turn sideways into the flow and move to a shallower area if it is difficult to maintain your balance.
5. You can use a long stick to help balance yourself while you wade to your desired location.
6. Check yourself for ticks when you get back to the car.

Bridge Sampling Safety

1. Do not lean on any unstable railings on the bridge.
2. While lowering the bucket down, or while pulling it up, make sure your feet are not caught in the rope!
3. Never put yourself in a dangerous situation. Use your best judgment while on the bridge. If you feel in danger, consider wading in to take a sample.
4. If there is guardrail check it for hornet nests on the backside before leaning over it.

Poison Ivy

Poison ivy is a common plant along the shores of New Hampshire's rivers and streams and along the embankments of bridges. The best way to avoid contact with poison ivy is to wear your waders when moving through an area where the plant is present.

Poison ivy typically has three leaflets (but it can be found with more) with an oily sheen on their surface. It grows as a climbing or low crawling vine, or independently (one stem with three leaves).



Spring

Summer

Fall

Poison Sumac

Poison sumac is actually related to the poison ivies not to the other sumacs. It is relatively rare in New Hampshire but is still out there. The rash-causing agent, urushiol, is the same, and it causes the same rashes as to poison ivy. Poison sumac is typically abundant in wetland habitat but can be found near ponds as well. The best way to avoid contact with poison sumac is to wear your waders when moving through an area where the plant is present.

Poison sumac leaves are NOT saw-toothed and the stems are red.



If you know you walked through poison ivy or sumac:

Avoid touching your clothing/waders from the knee down to the boots. If necessary, use gloves to remove your waders. If you suspect you have contacted poison ivy/sumac with your bare skin, use Technu to minimize the risk of developing a rash. Another solution is using blue Dawn dish detergent and a face cloth to scrub skin using COLD water.

Deer Ticks

Ticks, which can carry the Lyme disease bacterium, prefer wooded and bushy areas with high grass and abundant leaf litter. Deer ticks can be present from May through November but are more common during the warmer summer months. During spring and early summer deer ticks can be very small.

Deer ticks can transmit Lyme disease if they are attached to your body for 24 hours or more. If you find a tick latched onto you, you should remove the tick as soon as possible by using tweezers or a tick removing tool. Grab the tick by the head as close to your skin as possible and pull it up slowly and firmly. If you have a tick latched on to you it is advisable to seek counsel from your doctor as to any additional treatments that might be needed.

 TickEncounter Resource Center ***Ixodes scapularis* (Blacklegged ticks or Deer ticks)**



To avoid ticks, avoid walking in tall grasses or shrubby areas. If you must travel through these areas, wear long pants with tall socks (preferably light colored clothing to better detect the ticks) or waders. Check yourself after every trip through the tall grass.



Quality Assurance & Quality Control

In order for VRAP data to be used to assess NH's surface water quality, the data must meet quality control guidelines. The VRAP Quality Assurance/Quality Control (QA/QC) measures include a four tiered approach to ensuring the accuracy of the equipment and consistency in sampling efforts.

1. Calibration:

- ✓ Calibrate the pH and dissolved oxygen meters prior to each measurement.
- ✓ Check the conductivity and turbidity meter against a known standard prior to the first measurement of the day.

2. Replicate Analysis

- ✓ Measure and record a second measurement by each meter from the same bucket of water at one of the stations during the sampling day.
- ✓ Replicates should be measured within 15 minutes of the original measurements. If more than one team is out sampling each team should complete a replicate analysis.
- ✓ The dissolved oxygen and pH meters should be recalibrated prior to measuring the replicate

3. Meter Precision Checks

At one station during the sampling day, perform meter precision checks. These measurements serve to ensure the accuracy of each meter. Meter checks include:

- ✓ **6.0 pH Standard:** Measure and record a reading of the 6.0 pH buffer. Do not calibrate the meter prior to this measurement as it is intended to detect drift in the meter. The acceptable range is 5.7 – 6.3 pH units.
- ✓ **DI (De-Ionized) Turbidity Blank:** Measure and record a reading of the DI turbidity blank (0 NTU). The acceptable range is 0 – 0.25 NTU.

4. End of the Day Conductivity & Turbidity Meter Checks

- ✓ Re-check and record a reading of the conductivity and turbidity meters against known standards at the conclusion of each sampling day.

If the same sampling schedule is used throughout the monitoring season, the Replicate and Meter Precision Checks should be conducted at **different stations** over the sampling season.

Sample Collection Protocols

Sampling From a Bridge

The sample should be collected from the upstream side of the bridge in the center of the river or where moving. The exception to this is if the upstream side of the bridge has no safe place to walk but the downstream side has a sidewalk/bike path. In that case you should sample on the safer downstream side and note on datasheet.

What you'll need:

- ❖ Bucket with rock or weight taped on one side
- ❖ Rope attached to a bucket

Collecting the water sample from a bridge:

- ❖ Attach the end of the rope to the handle of the bucket. Lower bucket into the river from the upstream side of the bridge (water flowing toward you).
- ❖ Fill $\frac{1}{4}$ of the bucket with water.
- ❖ Pull the bucket up, swish the water around to thoroughly rinse the bucket and discard the rinsed water on the opposite side of the bridge – do not release the water to the area where you will be taking the final sample. Repeat this process 2 more times (total of **3** rinses).
- ❖ Return the bucket into the river from the upstream side of the bridge and slowly fill the bucket with water. Allow the water to flow into the bucket as slowly as possible.
- ❖ Slowly pull up the bucket with sample water. Do not bump the bucket against the bridge or otherwise agitate the sample water in the bucket as this may introduce additional oxygen and sediment thereby yielding inaccurate readings. If sample does become altered in some way, you need to dump the bucket and refill it.
- ❖ Carefully carry the sample back a safe location. Place the bucket in the shade and out of the rain if possible.

Sampling Via Wading

For wadeable streams, samples can be collected by wading directly into the river. Do not wade into water that is more than waist deep. Be sure that your partner on shore knows that you are entering the water and is available to assist you if need be.

What you'll need:

- ❖ A pair of waders or water shoes
- ❖ Bucket
- ❖ *E. coli* bottle (as needed)

Collect *E. coli* Sample

- ❖ Carefully wade into the river as close as possible to the center as can be done safely.
- ❖ Carefully remove the lid of the *E. coli* bottle making sure not to touch the sterile inside of the lid or the bottle. Hold the lid in one hand without touching the inside.
- ❖ Facing upstream, use a “U”-shaped motion and thrust the bottle under the water’s surface and fill in one continuous upstream motion away from you, turning the bottle right side-up at the bottom of the “U”. In this fashion, the water will flow into the bottle, then over your hand. Fill to the neck of the bottle.
- ❖ Put the cap on tight and place the bottle somewhere safe on the shore or in your pocket. If this is a replicate site be sure to fill a second bottle that has been labeled with “-REP” at the end of the station ID (i.e. 01-HOB-REP).

Collect Sample with a Bucket

- ❖ Wade back out to same spot where *E. coli* was taken. Try to minimize the amount of sediment stirred up from the bottom and chose a sampling location near the center of the stream that has not been disturbed by agitated sediment.
- ❖ Facing upstream, dip the bucket into the water and fill $\frac{1}{4}$ of the bucket. Rinse the water in the bucket and return the water to the stream behind you (downstream) with minimal disturbance of the surface of the river. Repeat this process 2 more times (total of 3 rinses).
- ❖ Facing upstream, dip the bucket into the water and fill it as slowly as possible until the bucket is $\frac{3}{4}$ full.
- ❖ Carefully carry the sample back to a safe location. Place the bucket in the shade and out of the rain if possible.

Pre-sample collection: Labeling Bottle

It is important that the bottles be labeled before the sample is poured into the bottle while the sample bottle is still completely dry. It is very difficult to properly write on a wet sample bottle. Be sure to use neat and legible writing on the bottles.

Information to include on labels:

- ❖ Test(s) required (e.g. TP/TKN)
- ❖ Station ID (e.g. 01-CTC, 02-ISG-REP)
- ❖ Date (mm/dd/yy) and time (hh:mm in military time) of collection (e.g 7/12/20 14:45)
- ❖ Collectors’ initials

Fill Bottles for Laboratory Analysis

- ❖ Fill all labeled sample bottles completely with the water contained in the bucket. The brown nutrient bottles contain a small amount of acid to preserve the sample – do not pour this acid out. Use caution when opening the acid preserved sample bottles, as pressure may have built-up in the empty bottles during travel.

- ❖ Be careful not to overtop bottles when filling them, particularly the brown nutrient bottles, as overflowing them could flush out the acid preservative.
- ❖ Place all filled water sample bottles on ice in the cooler as soon as possible after collection, and ensure the top of the cooler is tightly closed.

Once the sample bottles have been filled for laboratory analysis the handheld meters should be used to measure the parameters below by following the protocols in the next section.

- Dissolved Oxygen (% Saturation and mg/L)
- pH
- Specific Conductance
- Turbidity
- Water Temperature

LABORATORY SAMPLES

It is important to submit laboratory samples as soon as possible to ensure they do not expire before analysis. **Table 1** below provides information regarding the storage of samples and the maximum hold times.

It is helpful to remind VRAP staff when you are bringing in samples. This is also helpful to the laboratory staff especially when a large number of samples are expected.

The Public Health Laboratory Hours:

8am - 3pm Monday through Thursday

8am - 1pm on Friday.

Table 1. VRAP Laboratory Parameters

Analytical parameter	Sample Volume	Container Size and Type	Preservation Requirements	Maximum Holding Time	Lab Cost
<i>E. coli</i>	100 mL	120 mL sterile clear polyethylene	chilled to $\leq 10^{\circ}\text{C}$	8 hours	\$30
Total Phosphorus (TP)	50 mL	250 mL brown polyethylene	acidified, light protected, chilled to 4°C	28 days	\$20
Chloride (Cl)	40 mL	40 mL or 250 mL white polyethylene	chilled to 4°C	28 days	Free @ JCLC
Nitrate+nitrite (NO_3+NO_2)	40 mL	40 mL or 250 mL white polyethylene	chilled to 4°C	48 hours	
Total Kjeldahl Nitrogen (TKN)	40 mL	250 mL light protected polyethylene	acidified, light protected, chilled to 4°C	28 days	\$37
Ammonia (NH_3)	40 mL	250 mL light protected polyethylene	acidified, light protected, chilled to 4°C	28 days	
Chlorophyll <i>a</i> ^b	500 mL	500 mL light protected polyethylene	light protected, chilled to 4°C	24 hours	Free @ JCLC
Hardness	500 mL	500 mL LDPE or HDPE	acidified, light protected, chilled to 4°C	14 days	
Metals	500 mL	500 mL LDPE or HDPE	acidified, light protected, chilled to 4°C	14 days	

Completing the NHDES Laboratory Services Login & Custody Sheet

The following is a guideline for completing the Laboratory Services Login & Custody Sheet which is required to be submitted along with your laboratory samples. If you can let a VRAP staff member know ahead of time we may be able to meet you at the lab and provide assistance with laboratory login if it would be helpful.

If you are bringing in chloride samples those should be dropped off at the Jody Connor Limnology Center (JCLC). When you arrive at the JCLC tell the staff person who greets you that they are VRAP chloride samples. They will place them in the refrigerator and alert a VRAP staff person that they have arrived.

All other laboratory samples need to be brought to the New Hampshire Public Health Laboratory window. Let the lab staff member know they are VRAP samples and they will assist you with the login and chain of custody form.

Below are the key pieces of information that you need to fill out on the login form. At the end of this section is an example of a filled out lab login and custody form.

Lab Account (Billing): Use the VRAP lab account number (**05-0022518**) or your group's unique laboratory account number.

One Stop Project: VRAP

Description: River or VRAP group name

Collected By: The name and phone number of the person who should be contacted if there are any questions about the samples.

Contact & Phone Number: Ted Walsh ext. 2083 if you use the VRAP account number. Please record your name and phone number if you use your own lab account number.

Station ID: Please use the NHDES VRAP Station IDs (i.e. 02-CLD). If you have collected a replicate sample put "-REP" at the end of the station ID (i.e. 02-CLD-REP). If this is a new station without a VRAP ID use WSHEDTBD. If you have multiple new stations use the ID's WSHEDTBD1, WSHEDTBD2 for as many as needed. For these new stations it is important to write something in the Sampler Comments field that provides a unique brief description of the location (i.e. Oak St Bridge Concord, Upstream of Big Creek, Nice Pond outlet, ect).

Date/Time Sampled: Date and time of each sample collected. Use military time (i.e. 14:30)

Number of Containers: Number of sample bottles per station.

Matrix: For all water samples write "AQ" for aqueous.

Parameters Sampled: In the columns to the right of the Matrix column, please fill in a box of each sample bottle. In most cases you would write one parameter per bottle. If you are sampling for Total Phosphorus and Total Nitrogen the lab can analyze both parameters from the brown nutrient bottle. In this case you would write TP/TKN as the parameter.

Sampler Comments: Leave blank unless this is a new station without a station ID. In that case, use "WSHEDTBD" in the Station ID column and write a brief description in this box.

Lab Login #: Leave blank

Relinquished By: Sign your name

Date & Time: Date and time you signed your name

Received By: Leave blank. This will be completed by Laboratory Services personnel.

Please fill in the number of pages (Example: Page 1 of 1) at the bottom of the sheet.

NHDES LABORATORY SERVICES LOGIN AND CUSTODY SHEET

(Laboratory Policy: Samples not meeting method requirements will be analyzed at the discretion of the NHDES Laboratory.)

Samples must be delivered in a cooler with ice or ice packs.

LAB ACCOUNT (Billing) 05-0022518 One Stop Project: VRAP NHDES Site Number _____

Description: Bellamy River Town: _____ Temp. °C. 23

Collected By: Volunteer's name & # Contact & Phone # Ted Walsh 271- 2083

Station ID	Date & Time Sampled	# of Containers	Matrix	Total Phosphorus	E. coli						Sampler Comments	Lab Login #
05-BLM	6/11/18 9:25	2	AQ	X	X							
06-BLM	6/11/18 10:12	1	AQ	X	X							
12-BLM	6/11/18 12:45	2	AQ	X	X							
12-BLM-REP	6/11/18 13:00	2	AQ	X	X							

Relinquished By: VRAP Volunteer Date and Time: 6/11/18 15:00 Received By: _____

Relinquished By: _____ Date and Time: _____ Received For Laboratory By: _____

Matrix: A= Air S= Soil AQ= Aqueous (Ground Water, Surface Water, Drinking Water, Waste Water) π Other:

Page 1 of 1 Data Reviewed By: _____ Date: _____

Section No.: 22.0
Revision No.: 6
Date: 4-8-10
Page 1 of 1

VRAP FIELD DATA SHEET

The VRAP Field Data Sheet is intended to record all of your water quality measurements, QA/QC activities and other information you think would be helpful in interpreting the results and documenting the conditions you encountered.

Some items to note when filling out the field data sheet:

- Please write neatly. If you make a mistake neatly cross out the incorrect information and make edits as needed.
- Be sure to do a replicate sample for each sampling day (even if you only sample one station).
- Complete all of the needed QA/QC checks including pre-sampling checks, calibrations, meter precision checks and end of the day meter checks.
- On the back of the data sheet there is space to provide weather and any information that would be helpful to us as we review that data and interpret the results.
- On the back of the form please fill in the appropriate information regarding laboratory samples you have collected.
- Complete end of day check list on back of data sheet

A blank datasheet is provided at the end of this document for your use. It is helpful to VRAP staff to receive the data sheets soon after the data is collected. This allows us to review the data and assist with any problems you may have had with the meters. It also allows NHDES to detect any water quality concerns that need immediate attention.

VRAP Field Data Sheets can be mailed to:

NH Volunteer River Assessment Program
NH Department of Environmental Services
Watershed Management Bureau
29 Hazen Drive PO Box 95
Concord, NH 03302-0095

They can also be e-mailed as PDF to ted.walsh@des.nh.gov or michele.condon@des.nh.gov

VRAP FIELD SAMPLING SELF-ASSESSMENT FORM

During each sampling day VRAP volunteers should fill out and submit the VRAP Field Sampling Self-Assessment Form with the Field Data Sheet. This self-assessment is a check list to assist volunteers in ensuring that high quality data is collected and that the water quality meters are used correctly. Volunteers should check off the necessary tasks as they are completed throughout the sampling day. There is space available for comments if you want to alert DES staff of any issues you encountered while sampling. A copy of the Field Sampling Self-Assessment Form is available on the [NHDES VRAP webpage](#).

WATER QUALITY MONITORING EQUIPMENT STANDARD OPERATING PROCEDURES (SOPs)

This section of the VRAP protocols is intended to be a step-by-step guide to properly operate the water quality monitoring equipment and conduct all of the necessary QA/QC procedures. NHDES provides equipment to some VRAP groups and in some cases groups have purchased their own equipment. These SOPs include all of the types of equipment NHDES provides and almost all of the meters used by VRAP groups with their own equipment. If your group uses a meter that is not included in these protocols VRAP staff can assist you in developing a SOP.

Regardless of the type of meter that is being used the QA/QC procedures should be followed for each parameter and each meter used.

General Tips

- Be sure to store the meters in a location that is dry and safe from extreme temperatures. The meters cannot be stored long-term in an unheated location in the winter.
- It is helpful to use a toolbox or similar waterproof container to store meters that do not come with their own cases, and all of the solutions and supplies needed to conduct VRAP monitoring.
- Always carry a set of spare batteries for each meter.
- When sampling is completed be sure to dry off the meters before putting them back in their storage cases.

If during your sampling day one of the meters malfunctions and you are not able to get it working properly, you can still continue monitoring!

Make a note on the Field Data Sheet that you were not able to measure a given parameter because of a malfunctioning meter and continue using the other meters.

Important Guidelines:

- Each parameter must be measured AT THE SITE. Samples should not be collected and then transported to be measured at a later time.
- Once the sample has been collected with the bucket, you should not wait more than fifteen minutes to begin taking readings with the meters as this allows time for the sample conditions to change (Temperature, DO and pH).
- Place the sample bucket in the shade, if possible, while taking the readings with the meters.
- Dissolved Oxygen must be calibrated at EACH site before any measurements from the sample bucket are obtained.

YSI 85 Meter

Water Temperature, Dissolved Oxygen & Specific Conductance

Check the Dissolved Oxygen Membrane and Calibration Chamber

Before sampling begins for the day, ensure the sponge inside the storage chamber is moist by adding a few drops of DI water. Turn the meter on its side to allow any excess water to drain out of the chamber. Return the probe to the storage chamber.

WAIT! Before calibrating the dissolved oxygen, make sure the meter has been turned on for at least 15 minutes with the probe INSIDE of the chamber.

Calibrate the Meter for Dissolved Oxygen

Calibration must be completed at each station prior to sampling including the replicate.

1. Record the time the meter was turned on the upper right section of VRAP Field Data Sheet.
2. Press the MODE button until the meter is in the dissolved oxygen percent saturation mode, as indicated by a small '%' on the right side of the screen.
3. Press and release both the DOWN and UP arrow buttons simultaneously. You will see a small 'CAL' in the lower left hand corner when you have successfully entered calibration mode.
4. The screen will prompt you to enter the local altitude in hundreds of feet. Use the UP and DOWN arrows to adjust the value appropriately (for example, entering a 12 indicates 1200 feet above sea level). *If you are unsure of the altitudes of your monitoring station contact your group's monitoring coordinator or VRAP staff.*
5. Press ENTER. On the VRAP Field Data Sheet, under the column "Dissolved Oxygen **Calibration Value**," record the dissolved oxygen calibration value that is displayed on the bottom of the screen. *The calibration value will vary with altitude and thus may be different at each station.*
6. Press ENTER again. The screen should briefly display SAVE and then automatically return to dissolved oxygen % measurement mode.
7. Wait approximately one minute for the Dissolved Oxygen % saturation to stabilize. On the VRAP Field Data Sheet in the column "Dissolved Oxygen % Saturation **Chamber Reading**" record the DO % saturation reading displayed on the screen. If drift occurs (goes up or down by more than 5%) ensure you have waited long enough for the reading to stabilize. If drift still occurs, recalibrate the DO.

Perform & Record the Initial Conductivity Check Value

This check is done at the FIRST station of the day.

1. Press the MODE button until the flashing °C appears on the lower right side of the screen and the units uS/cm are displayed. This is the temperature compensated specific conductance mode.
2. Remove the probe from the chamber and rinse it with DI water. Gently shake the probe to remove water from holes on top of probe and wipe dry with a Kimwipe.
3. Submerge the entire probe in the 2,000µS/cm conductivity standard solution.
4. Record the Specific Conductance reading at the top right of the VRAP Field Data Sheet “**Initial Meter Check- Conductivity**”. *A 20% error regardless of the standard used (e.g. 1,600 – 2,400µS) is acceptable. If the reading is outside of this range, please contact VRAP staff as soon as possible. You can continue to use the meter as the incorrect reading is most likely due to contaminated standard.*
5. Rinse the probe with DI water and gently shake the probe to remove water. Wipe dry with a Kimwipe and return it to the storage chamber.

Measuring Water Temperature, Dissolved Oxygen, and Specific Conductance

Note: This meter should remain on until the last station has been sampled. If the meter is turned off prior to the end of the sampling day, the meter must be turned on and allowed a 15-minute warm-up period, with the probe in its chamber, prior to calibration and additional sampling. Remember, the dissolved oxygen/temperature meter must be **calibrated prior to each dissolved oxygen measurement including the replicate.**

1. Remove the probe from the calibration chamber and rinse the probe with DI water. Shake the probe and wipe dry with a Kimwipe. Press the MODE button until a small % symbol appears in the upper right corner of the display screen.
2. Immerse the probe into the sample bucket ensuring the two black holes at the top of the probe are fully submerged. **Slowly** move the probe back and forth in the sample until the water temperature stabilizes. *Do not allow the probe to touch the side or bottom of the bucket while you are taking readings.*
3. Wait approximately 15 seconds then record the water temperature (°C) on the VRAP Field Data Sheet once it has stabilized.
4. Wait for the dissolved oxygen (% saturation) to stabilize. Once it is stable, record the value on the VRAP Field Data Sheet.

5. Press the MODE button ONCE and **immediately** record the value for dissolved oxygen concentration (mg/L) on the VRAP Field Data Sheet.

It is imperative that you are patient and wait for the Temp and DO% Saturation readings to stabilize before recording the other values.

6. Press the MODE button twice until the **flashing** °C appears on the lower right side of the screen. This is the Specific Conductance mode. Record the value displayed on the screen on the Data Sheet under the column "Specific Conductance uS/cm".

Note: If you are sampling under very cold conditions (<2°C.) you will get an error message. Press the MODE button until the display screen shows uS/cm with a non-flashing °C for the units. This is actual conductance. It can be converted to specific conductance by DES staff as long as water temperature is also measured. Please make a note on the Field Data Sheet if you measure **actual conductance**.

Perform & Record the End of the Day Conductivity Value

This check is done at the last station of the day.

1. Press MODE until the non-flashing uS/cm units and the **flashing** °C appears on the lower right side of the screen.
2. Rinse the probe with DI water. Gently shake the probe then wipe dry with a Kimwipe.
3. Submerge the entire probe in the 2,000µS/cm conductivity standard solution.
4. Record the specific conductance value at the bottom the Field Data Sheet in the section "End of Day Meter Checks".
5. Rinse the probe with DI water and gently shake the probe to remove excess water. Wipe dry with a Kimwipe before returning it to the storage chamber.

At the LAST STATION of the day, once all sample readings and checks are finished, you can shut the meter OFF.

YSI Pro 2030

Water Temperature, Dissolved Oxygen & Specific Conductance

Check the Dissolved Oxygen Membrane and Calibration Chamber

Before sampling begins for the day, ensure the sponge inside the grey, rubber storage chamber is moist by adding a few drops of DI water. Pour out any excess water. Return the probe to the rubber storage chamber. **Wait at least 15 minutes with the probe in the storage chamber before calibrating dissolved oxygen!**

Calibrate the Meter for Dissolved Oxygen

Calibration must be completed at each station prior to sampling including the replicate.

1. Record the time the meter was turned on the upper right section of VRAP Field Data Sheet.
2. Once the meter is turned on wait 15 minutes before proceeding with calibration.
3. Press and hold the Cal button for 3 seconds.
4. Scroll up or down to highlight “Dissolved Oxygen” and then press ENTER.
5. Highlight the “%” option and then press ENTER.
6. On the Field Data Sheet under the column “Dissolved Oxygen **Calibration Value**” record the calibration value ‘Cal Value’ from the display screen. This is the small number in the lower portion of the screen. The calibration value will vary with altitude and may be different at each station.
7. Wait about 15 seconds for the meter to stabilize and then press ENTER.
8. ‘Calibration Successful’ will be displayed briefly and then the instrument will return to the main screen. If ‘Unsuccessful Calibration’ is displayed, wait two minutes then repeat the calibration.
9. Wait approximately one minute for the DO % saturation value to stabilize on the display screen.
10. Record the DO% saturation value on the Field Data Sheet in the column “Dissolved Oxygen % **Saturation Chamber Reading**”.
11. If drift occurs (DO value goes up or down by more than 5%) ensure you have waited long enough for the reading to stabilize. If drift still occurs, follow steps 3-10 to re-calibrate.

Perform & Record Initial Specific Conductance Verification

1. Unscrew and remove the protective metal cage around the probe as well as the rubber storage chamber.
2. Rinse the probe with DI water and gently shake the probe to remove water from the conductivity sensors then wipe dry with a Kimwipe.
3. Pour 50 ml of the 2000 $\mu\text{S}/\text{cm}$ conductivity standard solution into a 100 ml plastic graduated cylinder. Place the probe in the graduated cylinder. The solution should cover the entire probe without overflowing the graduated cylinder.
4. Record the specific conductance value from the display screen on the top left of the Field Data Sheet '**Initial Meter Check-Conductivity**'. A 20% error is acceptable: (1,600 – 2,400 μS). If the reading is outside of this range; ensure the two black holes at the top of the probe are completely submerged and standard is fresh. Contact VRAP staff if is still out of range for the meter to be calibrated.
5. Rinse the probe with DI water and gently shake the probe to remove water from the conductivity sensors then wipe dry with a Kimwipe.
6. Replace the protective metal cage around the probe and rubber storage chamber.
7. Discard the 2000 $\mu\text{S}/\text{cm}$ conductivity standard solution.

Measuring Water Temperature, Dissolved Oxygen, and Specific Conductance

Note: This meter should remain on until the last station has been sampled. If the meter is turned off prior to the end of the sampling day, the meter must be turned on and allowed a 15-minute warm-up period, with the probe in its chamber, prior to calibration and additional sampling. Remember, the dissolved oxygen/temperature meter must be **calibrated prior to each dissolved oxygen measurement including the replicate.**

1. Remove the probe from the rubber calibration chamber and rinse the probe with DI water. Gently shake to remove excess water then wipe dry with a Kimwipe.
2. Immerse the probe into the bucket ensuring the two black holes at the top of the probe are underwater. Slowly move the probe back and forth in the sample until the water temperature stabilizes. Avoid having the probe touch the side or bottom of the bucket.
3. Wait approximately one minute then record the temperature ($^{\circ}\text{C}$) once it stabilizes.
4. Once the temperature is stable, watch the DO % Saturation value and wait to record this value until it is also fairly stable.

5. When the values are stable, record DO (%), DO (mg/L), and specific conductance (uS/cm) values on the Field Data Sheet under the appropriate column.

It is imperative that you are patient and wait for the Temp and DO% saturation readings to stabilize before recording any values.

Perform End of Day Meter Check at Last Station of Sampling Day

1. Unscrew and remove the protective metal cage around the probe as well as the rubber storage chamber.
2. Rinse the probe with DI water and gently shake the probe to remove water from the conductivity sensors then wipe dry with a Kimwipe.
3. Pour 50 ml of the 2000 $\mu\text{S}/\text{cm}$ conductivity standard solution into a 100 ml plastic graduated cylinder. Place the probe in the graduated cylinder. The solution should cover the entire probe without overflowing the graduated cylinder.
4. Record the specific conductance value at the bottom the Field Data Sheet in the section “**End of Day Meter Checks**”. A 20% error is acceptable: (1,600 – 2,400 μS). If the reading is outside of this range; ensure the top holes are completely submerged and standard is fresh. Contact VRAP if is still out of range for the meter to be calibrated.
5. Screw the protective metal cage back on to the probe and rinse with DI water. Place the rubber storage chamber back on the probe.
6. Discard the 2000 $\mu\text{S}/\text{cm}$ conductivity standard solution.

At the last station of the sampling day, once all sample readings and checks are finished, you can shut the meter **OFF**.

pH

Oakton pH 11 Meter

The pH meter must be calibrated prior to each measurement (at each station) including the **replicate**.

Remember:

- ! Be sure to never touch the glass bulb at the end of the probe, even with a Kimwipe.
- ! Only submerge the electrode probe a few inches. Do not allow the area above the clear plastic probe to be submerged.
- ! Never store the pH probe in DI water. *(If you run out of pH electrode storage solution you may temporarily store the pH probe in pH 4.0 buffer solution).*

pH Calibration

1. Unscrew the cap of the electrode storage container and remove the bottle at the end of the pH probe. Slide the screw cap a few inches up the probe. Rinse the probe with DI water including the glass bulb at the end. Wipe dry with a Kimwipe without touching the glass bulb at the end!
2. Press the ON/OFF button to turn the meter on. The MEAS (measure mode) indicator should be displayed in the top portion of the screen.
3. Press the CAL/MEAS button to enter pH calibration mode. The CAL (calibration mode) indicator should be displayed on the screen. *The primary display will show the measured reading while the smaller secondary display will indicate the pH standard buffer solution that the electrode is submerged in.*
4. Immerse the probe into the 7.0 pH buffer (yellow solution).
5. Wait for the measured pH value to stabilize and the READY indicator to appear on the display. The READY indicator may flash on and off so wait until it is steady to achieve an accurate calibration.
6. Press the HOLD/ENTER key to confirm calibration.
7. Remove the probe from the 7.0 buffer, rinse with DI water and wipe dry with a Kimwipe.
8. Place the electrode in the 4.0 pH buffer (pink solution).
9. Wait for the measured pH value to stabilize and the READY indicator to appear on the display. The READY indicator may flash on and off so wait until it is steady to achieve an accurate calibration.

10. Press the HOLD/ENTER button to confirm calibration.
11. Remove the probe from the 4.0 buffer, rinse it with DI water and wipe dry with a Kim wipe. The meter should automatically switch to the MEAS mode. If not, press the CAL/MEAS button to enter pH measure mode.
12. View pH Electrode Slope:
 - a. Press the SETUP button.
 - b. Press the UP button **twice** until you view "ELE P3.0"
 - c. Press the HOLD/ENTER button **twice**. The display will show the electrode slope in %.
13. Record the slope on the VRAP Field Data Sheet under the column "**pH Calibration Slope**". The slope should be between 95 – 105%.
If the slope is out of range you should try to re-calibrate the meter first. If the slope is still out of range you should replace the pH buffer solutions 4.0 and 7.0 with unused solutions. If the slope continues to be out of range you can continue measuring pH for the sampling day but please let DES staff know as soon as possible.
14. To return to measurement mode press the CAL/MEAS button **twice**. The MEAS (measure mode) indicator should be displayed on the screen.

Measuring pH

1. Rinse the probe with DI water and wipe the plastic areas dry with a Kimwipe.
2. Immerse the pH probe into the sample container and let it sit for a few minutes. **Do not submerge above the clear probe!** Slowly move the probe back and forth in the sample.
3. When a stable reading is achieved the READY indicator to be displayed for 10 seconds. It is common for the READY indicated to blink on and off while the reading stabilizes. Wait until the reading has stopped drifting for greater than **30 seconds**. Record the value on the VRAP Field Data Sheet.
4. Rinse the probe with DI water, wipe dry with a Kimwipe and return it to the electrode solution storage container. Ensure the electrode storage container is filled at least halfway with pH storage solution.
5. Turn the meter off and return the meter and the probe to its carrying case.

QA/QC Meter Check

At one of the stations during the sampling day measure and record a reading of the 6.0 pH buffer. DO NOT calibrate the meter before you take this reading.

1. Rinse the probe with DI water and wipe the plastic areas dry with a Kimwipe.
2. While in **measure mode**, immerse the pH probe into the 6.0 buffer solution and wait for the number to stabilize.
3. When a stable reading is achieved the READY indicator will appear. Record the value, station ID, in the data sheets "**QA/QC Meter Check**" box.

pH

Oakton pH 150 Meter

The pH meter must be calibrated prior to each measurement (at each station) including the **replicate**.

Remember:

- ! Be sure to never touch the glass bulb at the end of the probe, even with a Kimwipe.
- ! Only submerge the electrode probe a few inches. Do not allow the area above the clear plastic probe to be submerged.
- ! Never store the pH probe in DI water. *(If you run out of pH electrode storage solution you may temporarily store the pH probe in pH 4.0 buffer solution).*

pH Calibration

1. Unscrew the cap of the electrode storage container and remove the bottle at the end of the pH probe. Rinse the probe with DI water including the glass bulb at the end. Blot dry with a Kimwipe without touching the glass bulb at the end!
2. Press the POWER button to turn the meter on. The MEAS (measure mode) indicator should be displayed in the top portion of the screen.
3. Press the CAL/MEAS/BACK button to enter pH calibration mode. The CAL (calibration mode) indicator should be displayed on the screen. *The primary display will show the measured reading while the smaller secondary display will indicate the pH standard buffer solution that the electrode is submerged in. (You will not have to record these numbers)*
4. Immerse the probe into the 7.0 pH buffer (yellow solution) and swirl probe.
5. Wait for the measured pH value to stabilize and the READY indicator to appear on the display. The READY indicator may flash on and off so wait until it is steady to achieve an accurate calibration. The value should not change for 30 seconds if it is stabilized.
6. While still immersed in the pH 7 buffer, press the ENTER/HOLD key to confirm calibration. The primary value will flash DONE.
7. Remove the electrode from the 7.0 buffer, rinse with DI water and dry with a Kimwipe.
8. Place the electrode in the 4.0 pH buffer (pink solution) and swirl probe.
9. Wait for the measured pH value to stabilize and the READY indicator to appear on the display. The READY indicator may flash on and off so wait until it is steady to achieve an accurate calibration. The value should not change for 30 seconds if it is stabilized.

10. While still immersed in the pH 4 buffer, press the ENTER/HOLD button to confirm calibration. The primary reading will flash DONE.
11. Remove the electrode from the 4.0 buffer, rinse it with DI water and wipe dry with a Kimwipe. The meter should automatically switch to the MEAS mode.
12. Once on the measure screen the bottom right will have a percent value and that will be the pH Electrode Slope. If the number does not appear follow these steps:
 - a. Press the SETUP button.
 - b. Press the VIEW button three times until you view "ELE dAtA P5.0"
 - c. Press the ENTER/HOLD button twice. Calibration slope in % is displayed.
13. Record the slope on the Field Data Sheet under the column "pH Calibration Slope". The slope should be between 95 – 105%.

If the slope is out of range you should try to re-calibrate the meter first. Try waiting in each sample longer. If the slope is still out of range you should replace the pH buffer solutions 4.0 and 7.0 with unused solutions. If the slope continues to be out of range you can continue measuring pH for the sampling day but let the DES staff know as soon as possible.

Measuring pH

1. Rinse the probe with DI water and blot dry with a Kimwipe.
2. Immerse the pH probe into the sample container and let it sit for a few minutes. **Do not submerge above the clear probe! Slowly** move the probe back and forth in the sample.
3. It is common for the READY indication to blink on and off while the reading stabilizes. Wait until the reading has stopped drifting; this is achieved when the value does not change for about 30 seconds. Record the value on the Field Data Sheet under the column "pH (Units)".
4. Rinse the probe with DI water, blot dry with a Kimwipe and return it to the electrode solution storage container. Ensure the electrode storage container is filled at least halfway with pH storage solution.
5. Hold the POWER button to turn the meter off and return the meter and the probe to its carrying case.

QA/QC Meter Check

At one of the stations during the sampling day measure and record a reading of the 6.0 pH buffer. DO NOT calibrate the meter before you take this reading.

1. Rinse the probe with DI water and wipe the plastic areas dry with a Kimwipe.

2. Immerse the pH probe into the 6.0 buffer solution and wait for the number to stabilize.
3. When a stable reading is achieved the READY indicator will appear. Record the value, station ID, in the data sheets "QA/QC Meter Check" box.

Turbidity

LaMotte 2020

Initial Turbidity Check Value

1. Turn the meter on by pressing the READ button. A triangle should be displayed in the upper left corner of the display screen.
2. Find the glass vial labeled “1.0 NTU” standard and carefully wipe off any water, dust and/or fingerprints from the vial with a Kimwipe only.
3. Open the lid of the meter and align the etched arrow on the glass vial with the arrow under the meter lid. Insert the vial into the chamber and close the lid.
4. Press the READ button.
5. Record the value displayed at the top right of the VRAP Field Data Sheet as the **Initial Meter Check- Turbidity**. If the displayed value does not read “1.00” follow the steps for calibration below.

Turbidity Calibration

The turbidity meter needs to be calibrated using the 1.0 NTU standard once prior to the first measurement and checked once after the last measurement at the end of the day.

1. If the displayed reading of the 1.0 NTU standard is not exactly 1.00 then press and hold the CAL button until you see CAL displayed on the screen then release the button. The display value will flash.
2. Adjust the value with the up and down arrows until “1.00” is displayed.
3. Press the CAL button again to complete calibration.

Measuring Turbidity

1. Rinse the vial labeled “Sample” or “S” three times with DI water.
2. Fill the Sample vial with water from the bucket by carefully and slowly pouring the water down the side of the sample vial to avoid introducing any bubbles.
3. Wipe water, dust and/or fingerprints off the sample vial with a Kimwipe.
4. Open the lid of the turbidimeter and align the etched arrow on the sample vial with the arrow under the turbidimeter lid.

5. Close the lid. Press READ.
7. Record the displayed turbidity reading on the VRAP Field Data Sheet.
8. Turn the meter off by pressing/holding the READ button down until the display screen reads "OFF" then release the button.

QA/QC Meter Check

At one of the stations during the sampling day, measure and record a reading of the DI Turbidity Blank (0.0 NTU) standard. If the same sampling schedule is used throughout the monitoring season, the DI turbidity blank check should be conducted at different stations. Record the value, station ID, and time in the data sheets "QA/QC Meter Check" box.

Perform End of Day Meter Check at Last Station of Sampling Day

At the last site of the day, before you calibrate the meter, follow steps 1-4 from the **Initial Meter Check- Turbidity** section above to read the 1.00 standard and record the value under the "End of Day Meter Check" on the VRAP Field Data Sheet.

Turbidity

LaMotte 2020e

Initial Turbidity Check Value

1. Press the ON button to turn the meter on.
2. The asterisk should be to the left of “Measure”. Press the OK button.
3. The asterisk will now be to the left of “Scan Blank”. Locate the DI/Blank glass vial and carefully wipe off any water, dust and/or fingerprints from the vial with a Kimwipe.
4. Open the lid of the meter. Place the DI/Blank glass vial in the meter by aligning the arrow on the vial with the etched arrow under the lid of the meter. Close the lid. Press OK.
5. Remove the DI/Blank glass vial from the meter.
6. Locate the 1.0 NTU vial. Carefully wipe off any water, dust and/or fingerprints from the vial with a Kimwipe.
7. Open the lid of the meter and insert the 1.0 NTU vial into the chamber by aligning the etched arrow on the 1.0 NTU vial with the arrow under the lid of the meter then close the lid.
8. The asterisk will now be to the left of “Scan Sample”. Press OK.
9. Record the reading on the top left of the VRAP Field Data Sheet as the the **Initial Meter Check-Turbidity**. If the displayed value does not read “1.00” the meter needs to be calibrated. (See instructions below).

Turbidity Calibration

The turbidimeter needs to be calibrated checked once after the last measurement at the end of the day.

1. Press the down arrow once and you will see the asterisk displayed to the left of “Calibrate”. Press the OK button.
2. The number on the left will be highlighted. You can use the up and down arrows to make adjustments to the number that is highlighted. Once the highlighted number is correct press OK and the highlight will move to the next number on the right. If you are calibrating to a 1.0 NTU standard the display should read “01.00”.
3. You will see the asterisk to the left of “Set”. If the displayed calibration value is correct, press OK. The asterisk will now be to the left of “Measure”.

Measuring Turbidity

1. The asterisk should be to the left of “Measure”. Press the OK button.
2. The asterisk will now be to the left of “Scan Blank”. Locate the DI/Blank glass vial and carefully wipe off any water, dust and/or fingerprints from the vial with a Kimwipe.
3. Place the DI/Blank glass vial in the turbidimeter so that the arrow on the vial is aligned with the etched arrow under the lid of the meter. Press OK.
4. Remove the DI/Blank vial from the meter.
5. Rinse the vial labeled “Sample” or “S” three times with DI water.
6. Fill the sample vial with river water by carefully and slowly pouring the water down the side of the Sample vial to avoid introducing any bubbles.
7. Wipe any water, dust and/or fingerprints off the sample vial with a Kimwipe. Place the Sample vial in the meter by aligning the arrows and close the lid.
8. The asterisk should be to the left of “Scan Sample”. Press the OK button.
9. Record the displayed turbidity reading on the VRAP Field Data Sheet under the “Turbidity (NTU)” column.
10. Press the OFF button to turn the meter off.

QA/QC Meter Check

At one of the stations during the sampling day measure and record a reading of the DI Turbidity Blank (0.0 NTU) standard. If the same sampling schedule is used throughout the monitoring season, the DI turbidity blank check should be conducted at different stations. Record the value, station ID, and time in the data sheets “QA/QC Meter Check” box. You do not need to “Scan Blank” when doing this step. You can press the down arrow to move straight to “Scan Sample”.






End of the Day Meter Check

At the last site of the day, follow steps 1-8 in the **Initial Turbidity Check Value** section to read the 1.0 NTU standard and record the value under the “End of Day Meter Check” on the VRAP Field Data Sheet.

Turbidity



LaMotte 2020we




Initial Turbidity Check Value

1. Press and briefly hold the power button  to turn the meter on.
2. In main menu select “Measure” by pressing the  button.
3. Scroll down using the down arrow  to the setting that reads “Turbidity-With Blank” and press .
4. Carefully wipe off any water, dust and/or fingerprints from the “DI Blank” (0.0 NTU) vial with a Kimwipe only.
5. Open the lid of the meter and align the vertical white line located on the glass vial with the arrow under the meter lid.
6. Close the lid. Select ‘Scan Blank’ by pressing ENTER. This sets the meter to zero. *There will not be a numerical value displayed on the screen at this time.*
7. Remove the DI Blank vial and return it to the meter case.
8. Carefully wipe off any water, dust and/or fingerprints from the 1.0 NTU vial with a Kimwipe.
9. Open the lid of the meter and align the vertical white line located on the 1.0 NTU vial with the arrow under the meter lid.
10. Insert the vial into the chamber. Close lid. Select ‘Scan Sample’ by pressing .
11. Record the value at the top of the VRAP Field Data Sheet where it reads: “Initial Turbidity Meter Check Value”. If the value is not 0.75 and 1.25 NTU, you need to calibrate (see calibration section below).



Turbidity Calibration

The turbidimeter only needs to be calibrated if the initial turbidity meter check is outside the range of 0.75-1.25 NTU.

1. If the reading for the 1.0 NTU standard is not reading “1.00” press  (down arrow) until “Calibrate” appears on the LCD screen, and then press  to select “Calibrate”.

2. Use the up arrow or down arrow to change the highlighted digits on the display to read “1.00”.
3. Press  to select “Calibrate”.
4. Press  again to select “Set Calibration”.
5. Recheck the 1.0 NTU standard to ensure the calibration was successful by pressing  again to select “Scan Sample”.
6. Remove the 1.0 NTU standard from the meter and return it to the case.

Measuring Turbidity

1. Rinse the vial labeled “Sample” or “S” with DI or sample water three times.
2. Fill the sample vial with river water by carefully and slowly pouring the water down the side of the sample vial to avoid introducing any bubbles.
3. Wipe any water, dust and/or fingerprints off the sample vial with a Kimwipe.
4. Open the lid of the turbidimeter and align the etched arrow on the cleaned Sample vial with the arrow under the meter lid.
5. Close the lid. Press  to select “Scan Sample”.
6. Record the displayed turbidity reading on the VRAP Field Data Sheet in the column labeled “Turbidity (NTU)”.
7. If the turbidity value is greater than 10 NTU you should recalibrate the meter with the 10 NTU standard and take another reading. This will give a more accurate measurement of how high the turbidity level is. If you do recalibrate with the 10 NTU standard, be sure to indicate this under the “Comments” section on the back the VRAP Field Data Sheet. **Recalibrate with the 1.0 NTU at the next station to prevent the readings from being artificially elevated.**
8. Turn the meter **OFF** by pressing the power button 

QA/QC Meter Check

At one of the stations during the sampling day measure and record a reading of the DI Turbidity Blank (0.0 NTU) standard. If the same sampling schedule is used throughout the monitoring season, the DI turbidity blank check should be conducted at different stations. Record the value, station, and time on the VRAP Field Data Sheet under the section that reads “QA/QC Meter Check” at the bottom of the page.

End of the Day Meter Check

At the last site of the day, follow steps 8-11 in the **Initial Turbidity Check Value** section to read the 1.0 NTU standard and record the turbidity value under the “End of Day Meter Check” on the VRAP Field Data Sheet.



2020 Field Data Sheet

NH Volunteer River Assessment Program



VRAP Group: _____

Volunteers (First & Last Name): _____

Date: _____ / _____ / 2020

Time Dissolved Oxygen Meter Turned On: _____

Initial Meter Check

Conductivity (2,000 std): _____ (1,600-2,400 μ S)

Turbidity (1.0 std): _____ (+/- 0.25 NTU)

NHDES Station ID	Station Name Or Description	Time Sampled (HH:MM)	Turbidity (NTU)	pH Calibration Slope (95-105%)	pH (Units)	Dissolved Oxygen (Calibration Value)	Dissolved Oxygen (% sat. chamber reading)	Water Temp ($^{\circ}$ C)	Dissolved Oxygen (% Sat)	Dissolved Oxygen (mg/L)	Specific Conductance (μ S)
Replicate (Required Daily)											

QA/QC Meter Check Station: _____

6.0 pH Check: _____ (5.7 – 6.3)

Turbidity Blank (0.0 NTU) Check: _____

End of Day Meter Check

Conductivity (2,000 std): _____

Turbidity (1.0 std): _____

Please complete backside...

Weather: Clear Cloudy w/o Rain Intermittent Rain Cloudy w/Rain Snow Snowmelt

Wind: Calm Breeze Wind

Rain Past 3 Days? Yes No Unknown

Air Temperature (°F): Below 30 30s 40s 50s 60s 70s 80s 90s Above 90s

Water Level: Dry Very Low Below Average Average Above Average High

Comments: (ie: swimmers, water color, algae, etc.) Please indicate NHDES Station ID.

Laboratory Samples: Please list stations where lab parameters were taken. Check all parameters taken at each station. Be sure to list if replicates were taken.

Lab: Where the samples were relinquished to? NHDES PSU UNH EAI Other: _____

Station ID	Parameter 1	Parameter 2	Parameter 3	Parameter 4
	Chloride	E.coli	Total Phosphorous (TP)	Other:

End of Day Checklist:
(Check if Completed)

All Meters:
Dry & powered off _____

Turbidity:
Rinse sample vial & fill with DI water _____

pH:
Rinse probe with DI water & blot dry _____
Return probe to storage solution _____

YSI:
Rinse probe with DI water _____
Return probe in chamber _____

Equipment Kit:
Remove used Kim wipes _____
Clean off dirt, dust and moisture _____

Please return data sheets to:
Michele Condon
NH Volunteer River Assessment Program
29 Hazen Drive- PO Box 95
Concord, NH 03302-0095
603-271-6949
Michele.Condon@des.nh.gov

OFFICE USE ONLY:
Activity Date: _____
Date Entered: _____ By: _____
Date Proofed: _____ By: _____
Date QA/QC: _____ By: _____