COLLECTING DATA ON WATER CHEMISTRY

DAVID SCHUTZ & KAREN MCCAGUE

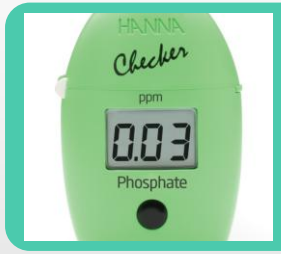
EDUCATION AND EXPERIENCE

- A.S. LABORATORY TECHNOLOGY/ ECOLOGY, HERKIMER N.Y.
- B. S. GENETICS/ ENVIRONMENTAL SCIENCES, CORNELL UNIVERSITY
- M. A. BIOLOGY/ CHEMISTRY, ADELPHI UNIVERSITY
- M. A. ADMINISTRATION, STONYBROOK UNIVERSITY
- MASTER NATURALIST PROGRAM UNIVERSITY OF FLORIDA

- RESEARCH ASSOCIATE, CORNELL LANGMUIR LABORATORY
- EDUCATOR, BIOLOGY/ LIVING ENVIRONMENT

Lab Work Nutrients and Turbidity

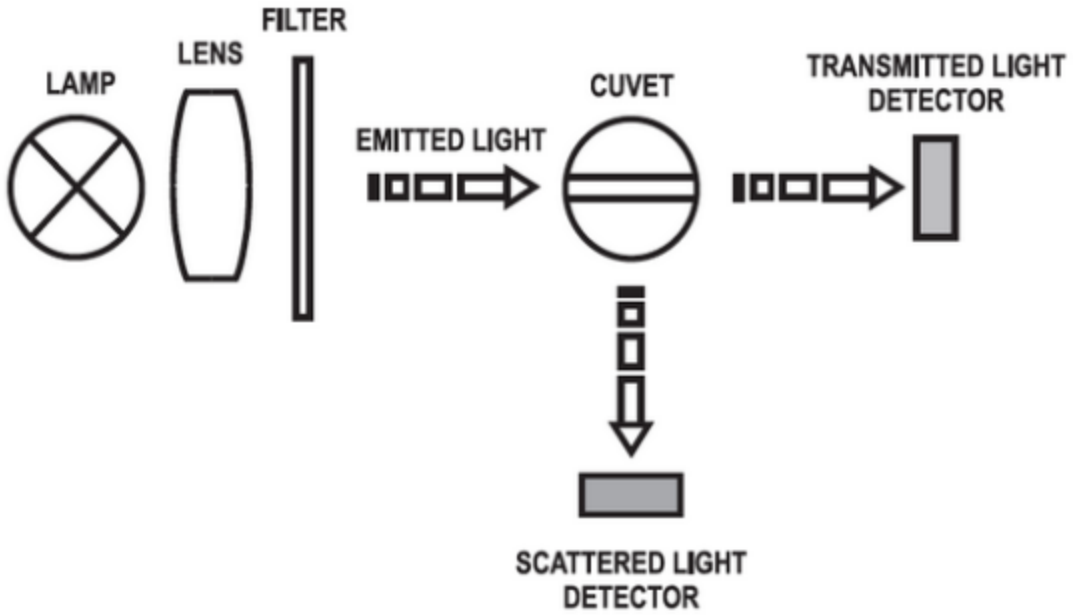
FIELD WORK



Phosphate

Nitrogen as Ammonia

Turbidity



Principle of Operation

The light beam that passes through the sample is scattered in all directions. The intensity and pattern of the scattered light is affected by many variables, such as wavelength of the incident light, particle size and shape, refractive index, and color. The optical system of the HI98703 includes a tungsten filament lamp, a scattered light detector (90°) and a transmitted light detector (180°).

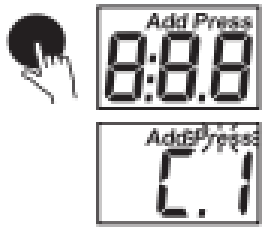
In the ratio turbidimeter range, the microprocessor of the instrument calculates the NTU value from the signals that reach the two detectors by using an effective algorithm that corrects and compensates for interferences of color. The optical system and measuring technique also compensate for fluctuations in lamp intensity, minimizing the need for frequent calibration.

In the non-ratio turbidimeter range, the NTU value is calculated from the signal on the scattered light detector (90°). This method offers a high linearity on the low range but is more sensitive to lamp intensity fluctuations. The lower detection limit of a turbidimeter is determined by stray light that is detected by the sensors but not caused by light scattering from suspended particles. The optical system of the HI98703 is designed to have very low stray light, providing highly accurate results for low turbidity samples.


Checker
ppm
1.2
Phosphate

Measurement Procedure

- Press the ON/OFF button to turn the checker on. All segments will be displayed for a few seconds, followed by "Add", "C.1" with "Press" blinking.

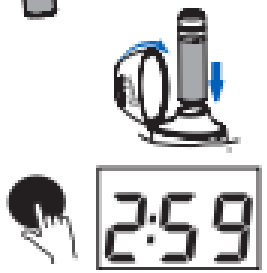


- Fill the cuvette with 10 mL of unreacted sample and replace the cap. Insert the cuvette into the checker and close the cap.

- Press the ON/OFF button. When the display shows "Add", "C.2" with "Press" blinking, the checker is zeroed.

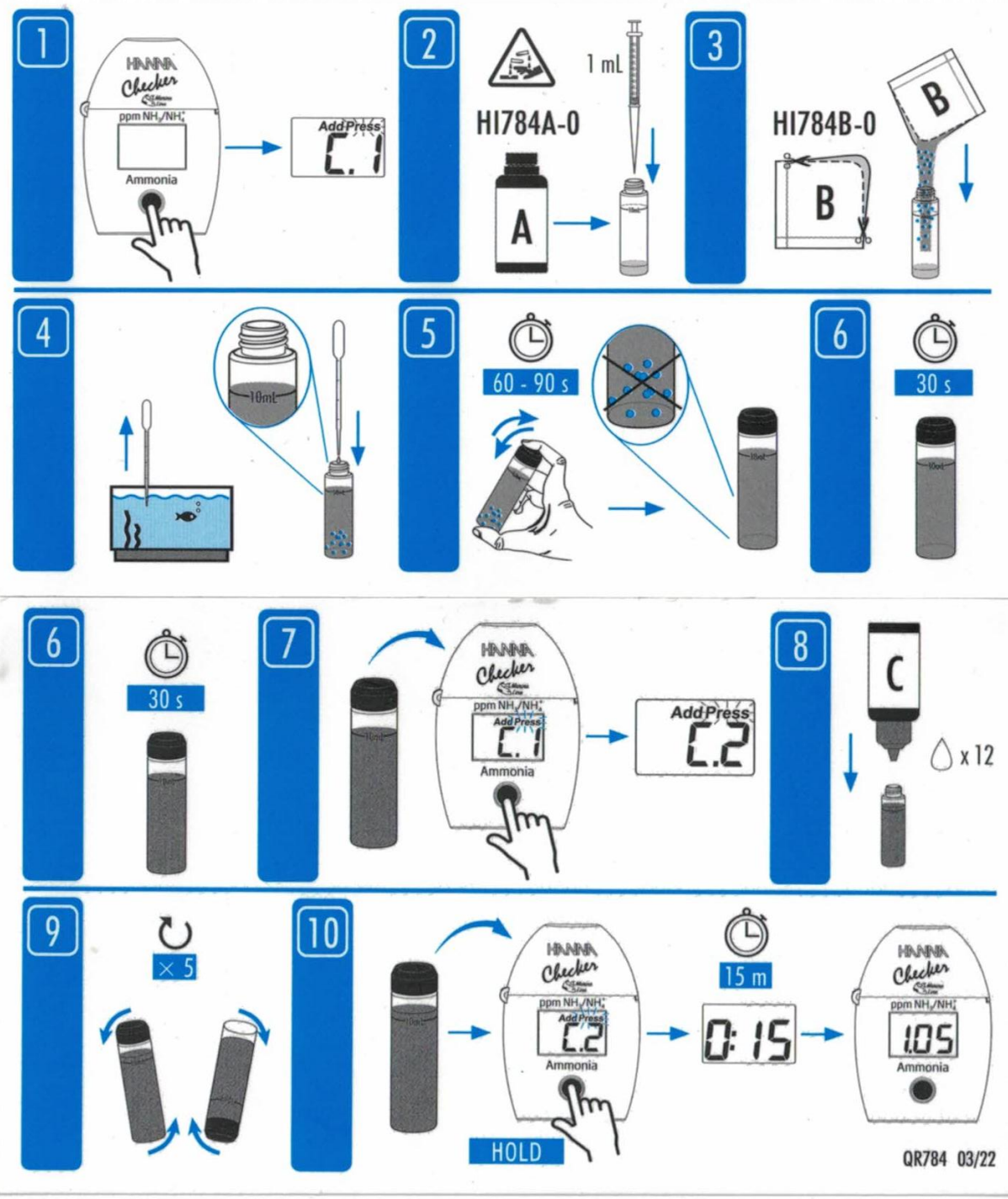
- Remove the cuvette, unscrew the cap and add the content of one packet of HI713-0 Phosphate Low Range reagent. Replace the cap and shake gently for 2 minutes until the powder is completely dissolved.

- Insert the cuvette into the checker and close the cap. Press and hold the ON/OFF button. The display will show the countdown prior to the measurement. Alternatively, wait 3 minutes and press the button.



- When the timer ends the checker will perform the reading. The instrument displays the phosphate concentration in ppm. The checker automatically turns off 2 minutes after reading.


How to
Use
The HI784
Marine
Ammonia
Checker®
HANNA
Checker
ppm NH3/NH4+
1.05
Ammonia


1
HANNA Checker
ppm NH3/NH4+
Ammonia
Add Press
C.1
2
HI784A-0
1 mL
A
3
HI784B-0
B
B
4
10mL
5
60 - 90 s
6
30 s
6
30 s
7
HANNA Checker
ppm NH3/NH4+
Add Press
C.1
Ammonia
Add Press
C.2
8
C
x 12
9
× 5
10
HANNA Checker
ppm NH3/NH4+
Add Press
C.2
Ammonia
HOLD
15 m
0:15
HANNA Checker
ppm NH3/NH4+
1.05
Ammonia
QR784 03/22

EDUCATION AND EXPERIENCE

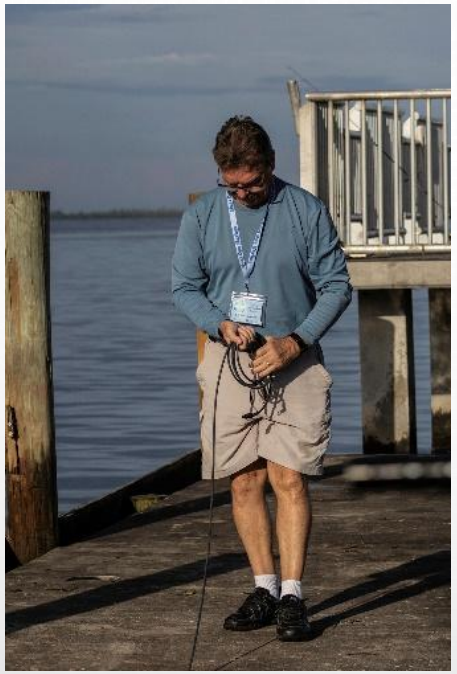
- BACHELORS – GEOLOGY, THIEL COLLEGE
- MASTERS – GEOLOGY/GEOCHEMISTRY, UNIVERSITY OF GEORGIA
- PROJECT MANAGEMENT/CHANGE MANAGEMENT/ORGANIZATION LEADERSHIP & DEVELOPMENT (PROFESSIONAL CERTIFICATIONS)
- MASTER NATURALIST PROGRAM, UNIVERSITY OF FLORIDA (IN PROGRESS)

- ENVIRONMENTAL/ANALYTICAL CHEMIST/LAB QA MANAGER- JTC ENVIRONMENTAL
- ENVIRONMENTAL SCIENTIST/ENVIRONMENTAL DATA MANAGER – BECHTEL (BEI)
- SYSTEMS ENGINEERING MANAGER – BECHTEL (BNI)/BECHTEL CORPORATE
- VP, IT – SCRIPPS NETWORKS/DISCOVERY COMMUNICATIONS (NOW WARNER BROS/DISCOVERY)

Citizens Partnership for Clean Canals

CPCC CITIZEN SCIENTISTS AT WORK

Sporting new Team Badges



Caring for a delicate sensor

Sample collection at Ponce Park

Training new recruits

Monitoring at the BSI Lock

Photo Credits to Deb Peterson

FIELD STANDARD OPERATING PROCEDURES
FOR FIB SAMPLE COLLECTION AND WATER QUALITY MEASUREMENTS

- ALIGNS WITH FDEP STANDARD OPERATING PROCEDURES FOR FIELD ACTIVITIES, REVISED JANUARY 2017-FDEP SOP 001/01
- CALIBRATE DEVICES NO EARLIER THAN THE NIGHT BEFORE SAMPLING/RE-CALIBRATE IN FIELD AS NEEDED
- SAFETY FIRST!
- COLLECT BACTERIA WATER SAMPLE
  - COLLECT SAMPLES AT LEAST 10 FEET FROM DOCK/SEAWALL AT A DEPTH OF 0.5 METERS
  - COLLECT THE BACTERIA WATER SAMPLES FIRST
  - FILL OUT THE BACTERIA CONTAINER LABEL BEFORE SUBMERGING/ATTACH CONTAINER TO SAMPLING POLE. WEAR GLOVES. DO NOT TOUCH INSIDE OF CONTAINER OR LID.
  - FACE BOTTLE OPEN SIDE DOWN AND LOWER INTO THE WATER UNTIL THE FLOAT BEGINS TO BE PULLED UNDER WATER. SLOWLY TURN UNTIL FACING UP. REMOVE BOTTLE FROM WATER/POLE. CAP AND PLACE IN COOLER. COVER WITH ICE.
- COLLECT SECCHI DEPTH AND WATER QUALITY FIELD MEASUREMENTS
- CLEAN AND STORE EQUIPMENT
- COMPLETE FIELD DATA SHEET FOR EACH LOCATION MONITORED
- COMPLETE CHAIN-OF-CUSTODY FORM
- TRANSPORT BACTERIA SAMPLES TO LAB/SAME DAY/WITHIN LAB REQUIREMENTS

CPCC Sample Collection Field Form

Trip Information

Sample Collection Date:_____	**Sample Collector:**_____
Precipitation in last 24 hours (cm):_____	**Field Observations:**_____
Field Meter ID:_____	**Field Documentation:**_____

Station Information

Station ID:	**PR-7: Gilchrist**	**Weather:** Sunny Partly Cloudy Overcast Fog/Haze Drizzle Rain
Latitude:	**26.930700°**	**Water Conditions:** Calm Ripples Waves White Caps
Longitude:	**-82.059510°**	**Tidal Stage:** Incoming High Slack Outgoing Low Slack
Sample Time:		**Water Color:** Clear/Blue Light Green Dark Green Light Brown Dark Brown Other:_____
Sample Depth (m):	0.5	**Secchi Depth (meters):** Disappear_____m Reappear_____m Average_____m
Blank Collected? Y N **Time:**		
Field Replicate Collected? Y N **Time:**		**Total Depth (meters):**

Instrument Measurements

Air Temp (C)	H2O Temp (C)	DO (mg/L)	DO (% Saturation)	pH	SpC (mS/cm)	Salinity (PSU)	TDS (g/L)

Samples Collected (Circle All That Apply):	Preservative Used (Circle All That Apply):
Bacteria: E. coli (Enterococci)	Ice Sodium Thiosulfate
Nitrogen: Ammonia Total Kjeldahl NO2-NO3	Ice H2SO4
Phosphorus: Total Ortho-Phosphate	Ice H2SO4
Bio/Anthropogenic Markers: qPCR Chemical Tracers	**External ID:**

Observations/Comments:

Benchmark EnviroAnalytical, Inc.
1001 Corporate Ave. Suite 102
North Port, FL. 34289
(941) 625-3137
(941) 240-3071 fax
www.Benchmarkea.com
Sample Temperature checked upon receipt with Temperature Gun ID #7

Client Information:	Team Punta Gorda
Address:	227 Sullivan
	Punta Gorda, FL 33952
Phone #	865-804-1352
Email	mccaguekaren@gmail.com
Laboratory Submission #	

Project Name: Citizens Partnership for Clean Canals (CPCC)

Sample Name	Total # of Containers	Sample Type[1] / Sample Matrix[2]	Collection		Container			Preservative[4] Lot: 1423160	Parameters for Analysis	Laboratory Sample #
			Date	Time	Qty	Capacity	Type[3]	Lab Preserved ☐		
	1	Grab / SW			1	100 mL	Sterile P	NaThio	Enterococci (Enterolert)	
	1	Grab / SW			1	100 mL	Sterile P	NaThio	Enterococci (Enterolert)	
	1	Grab / SW			1	100 mL	Sterile P	NaThio	Enterococci (Enterolert)	
	1	Grab / SW			1	100 mL	Sterile P	NaThio	Enterococci (Enterolert)	
	1	Grab / SW			1	100 mL	Sterile P	NaThio	Enterococci (Enterolert)	
	1	Grab / SW			1	100 mL	Sterile P	NaThio	Enterococci (Enterolert)	

Laboratory Sample Acceptability:
pH <2 : ☐ Temperature:

1	Collected By & Affiliation: (Print & Sign)	Date	Time	Received By & Affiliation: (Print & Sign)	Date	Time
2	Relinquished By & Affiliation: (Print & Sign)	Date	Time	Received By & Affiliation: (Print & Sign)	Date	Time
3	Relinquished By & Affiliation: (Print & Sign)	Date	Time	Received By & Affiliation: (Print & Sign)	Date	Time

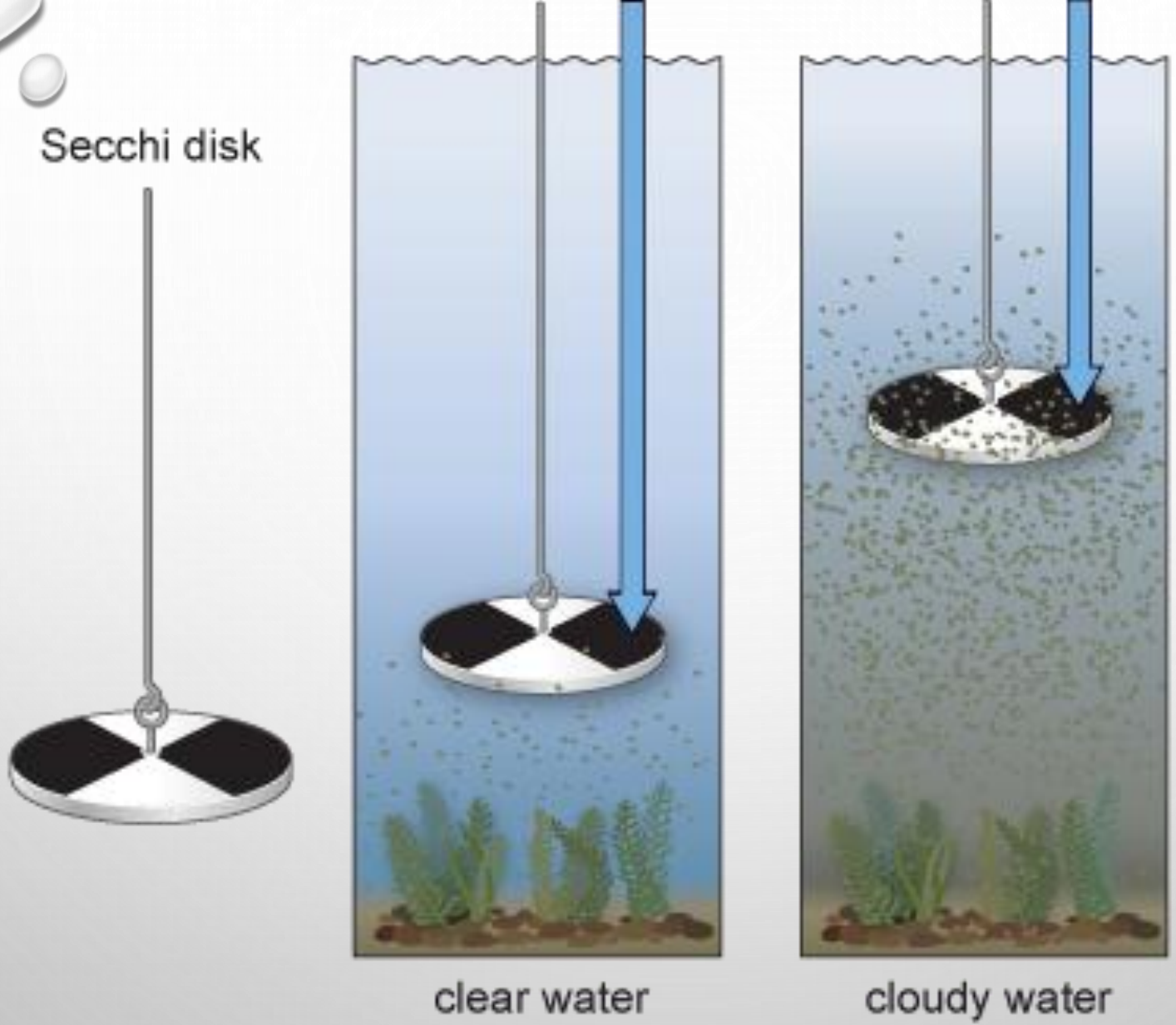
FIELD WORK

Depth

Transparency

Physical Properties

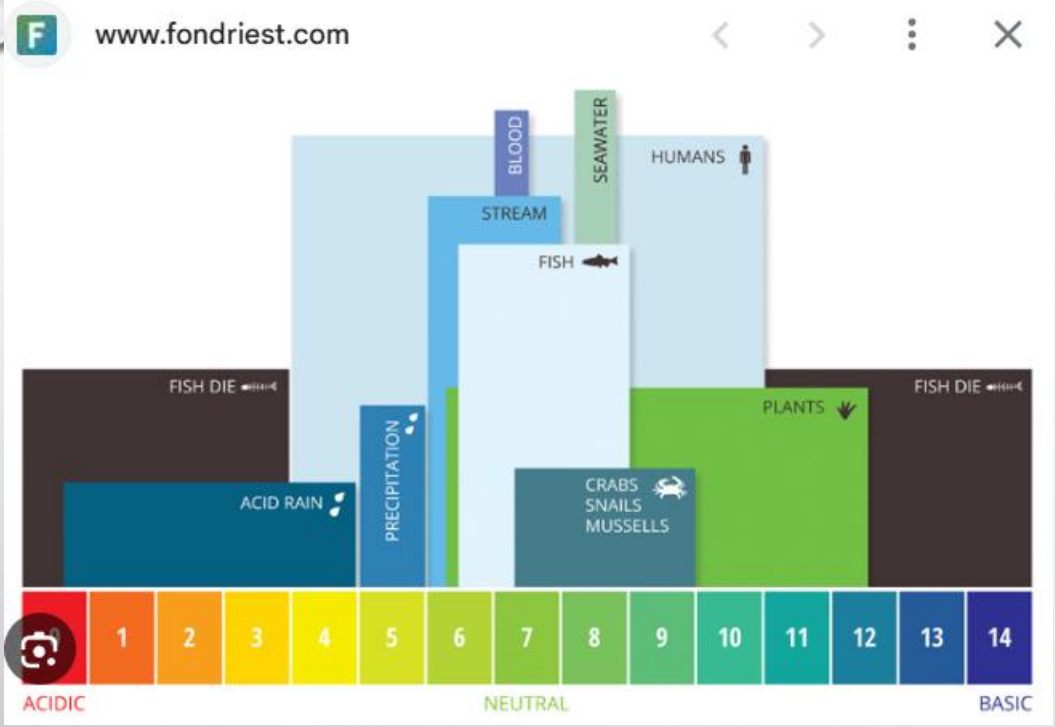

FISH FINDER
Water Depth
Temperature
Fish Depth
Fish Icon
Bottom Contour
Simulation Mode
Receiver Battery Indicater
Transducer Battery Indicater
Depth Scale
Depth Range
11.5 Ft
75.6 °F
6.0
6.0
8.0
8.0
12.5
12.5
ESC

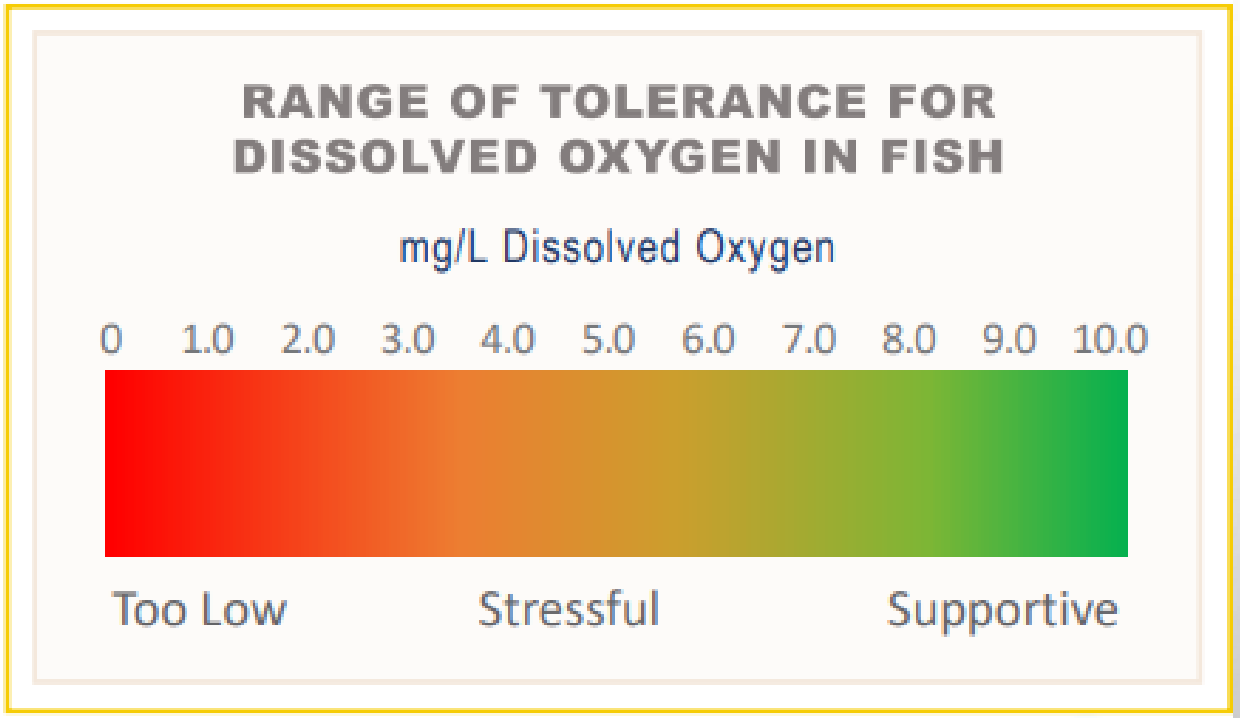

Secchi disk
clear water
cloudy water


HANNA
199.5 mV pH
1.60 pH
220.6 ORP
29 %DO
2.21 ppm DO
96 µS/cm
96 µS/cm
.0 10 MΩ·cm
0 ppm TDS
0.00 PSU
0.0 %
25 °C
Log
Menu
HI 98194
pH/EC/DO Multiparameter
ESC
HELP


ESC
HELP

FIELD MEASUREMENTS – HANNA MULTI-PARAMETER PROBE

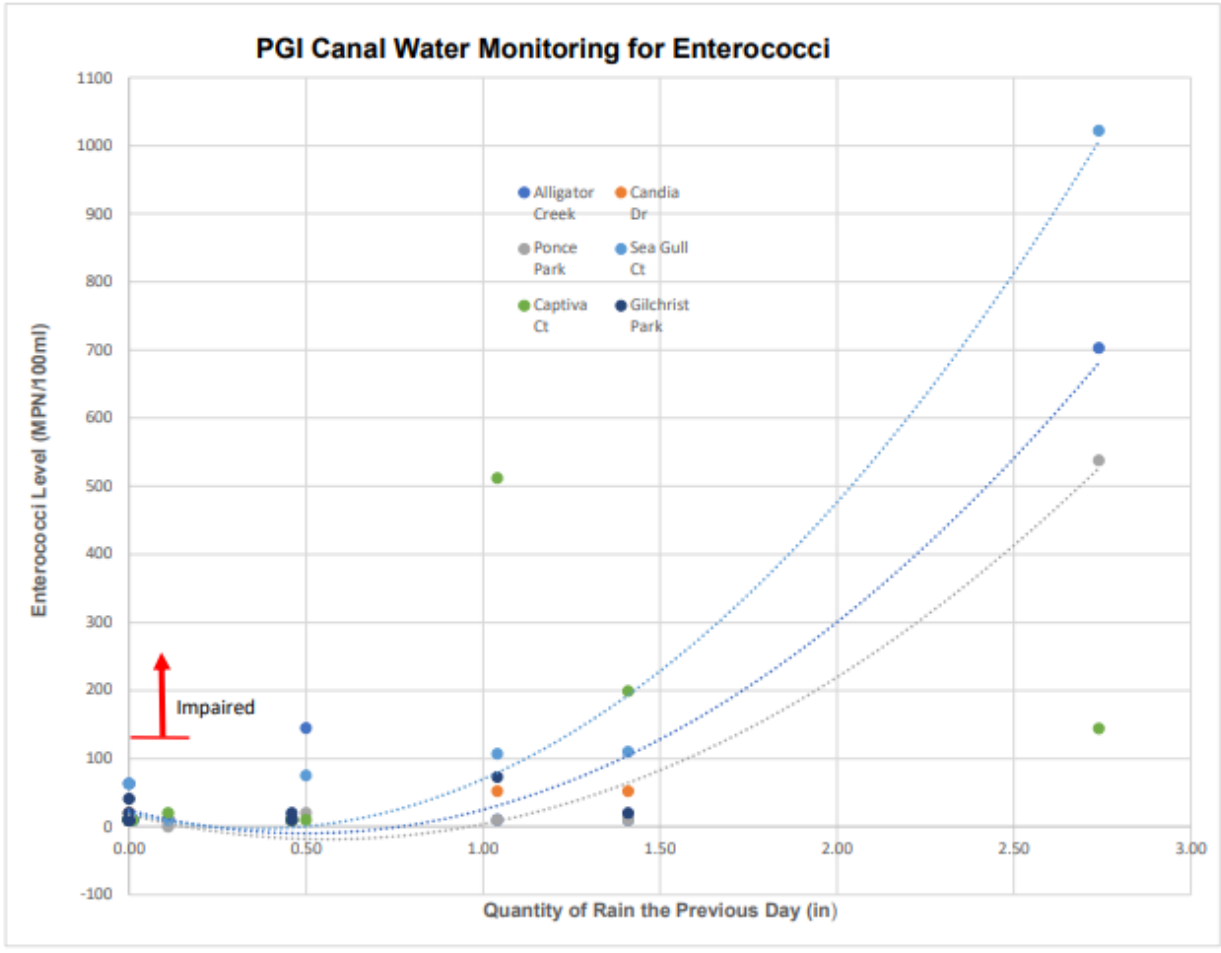




Parameter (Hanna Probe)	Expected Value Range	EPA Criteria for Estuary	CPCC
pH	6-9	6.5-8.5	6.7-8.4
Dissolved Oxygen (mg/L)	>1-10	>4	<1-7.9
Dissolved Oxygen (% Saturation)	20-120	>48	12-95
Conductivity (mS/cm)			8.08-48.38
Salinity (PSU/PPT)*	0-37	0.5-30	4.07-31.4
Total Dissolved Solids (g/L)*			13.03-23.11
*Calculated values based on Conductivity			

Citizens Partnership for Clean Canals (CPCC)

		Enterococci (MPN/100 ml), Subsurface Water Sample					
Sample Date	24-hr Rain (in)	Alligator Creek	Candia Dr	Ponce Park	Sea Gull Ct	Captiva Ct	Gilchrist Park
4/1/2024	0.00	10		10	10		
5/6/2024	0.01	10		10	10		
6/3/2024	0.00	10		10	63		
7/1/2024	0.01	10		10	10	10	
8/6/2024	2.74	703		538	1022	144	
9/3/2024	0.50	145		20	75	10	
10/22/2024	0.11	10	10	Closed due to storm	10	20	
11/4/2024	0.00	63	10		10	10	
12/3/2024	0.00	10	10		10	10	10
1/6/2025	0.00	10			10	10	20
2/3/2025	0.00	10	20	10	10	10	41
3/3/2025	0.00	10	10	10	10		10
4/7/2025	0.00	10	10	19	10	10	10
5/5/2025	1.04	10	52	10	107	512	73
6/2/2025	1.41	10	52	10	110	199	20
7/7/2025	0.46	10	10	10	10	10	10
8/4/2025	0.00	10	10	10	10	10	10
9/2/2025	0.46	10	10	10	10	10	20
Arithmetic Mean		59	19	49	84	70	22
Geometric Mean		16	14	15	21	21	17
Rain-EC Correlation		0.82	0.89	0.83	0.88	0.53	0.45
Log Correlation AC to SG		0.98	Log+1 Correlation AC to SG				0.68



LEGEND	
No rain	Enterococci below minimum detection level
<1" rain	Enterococci detected below impairment level
>1" rain	Enterococci detected above impairment level

CONTACT

DAVID.SCHUTZ@HEALOURHARBOR.ORG

KAREN.MCCAGUE@HEALOURHARBOR.ORG