

Centre County Pennsylvania Senior Environmental Corps 2022 Equipment Check & Percent Recovery

The mission of the Centre County Pennsylvania Senior Environmental Corps (CCPaSEC) is to develop and to support teams of senior citizens who gather and publish data on the quality of water in the streams of Centre County.

Through public outreach, with the assistance of the ClearWater Conservancy, the Centre County Conservation District, and other environmentally concerned organizations, CCPaSEC seeks to keep the public informed of the importance of clean water and how the management of our natural resources affects the quality of streams in the county.

Our Quality Control team evaluates our equipment every year. Our field equipment cannot achieve laboratory levels of accuracy. Users of our data need know the limitations of our field equipment to correctly comprehend our data.

We collect all of our field kits early in the year to evaluate and report on the condition and capabilities of our equipment.

We thank the Bald Eagle State Park Service who provided us with the room and facilities to conduct this year's program.

The results are important to users of our data and demonstrate that our equipment is functioning well.

The CCPaSEC Quality Control team conducted our yearly Equipment Check on January 21, 2022.

Twelve (11) CCPaSEC teams' field kits were collected and evaluated in the exercise.

Procedure:

The CCPaSEC Equipment Check procedure is available on our WEB page:

<https://www.ccpasec.org/index.php/quality-control>

The field kits were examined by our Quality Team volunteers for:

- Physical condition of the equipment.
- Oakton meters - pH & conductivity, ($\mu\text{S}/\text{cm}$)
- Colorimeter - Nitrate, Sulfate & Phosphate, (mg/L)
- Dissolved Oxygen (mg/L)
- *FLOWATCH*[®] flow meter, velocity (cm/Sec)

The process includes replacing all batteries and maintenance as required.

The results are presented as Percent Recovery (PR) which is an indicator of our equipment capability.

Percent Recovery $PR = \text{Mean} / \text{Standard} \times 100$

Where the mean is the average value of the parameter measurements and the standard is the value of the standard solution shown on the bottle label.

EASI (Environmental Alliance for Senior Involvement), and Nature Abounds established a Percent Recovery goal for all equipment be within the range of 100 +/- 10 %.

We evaluate our kit's colorimeter and Oakton meters with traceable standard solutions.

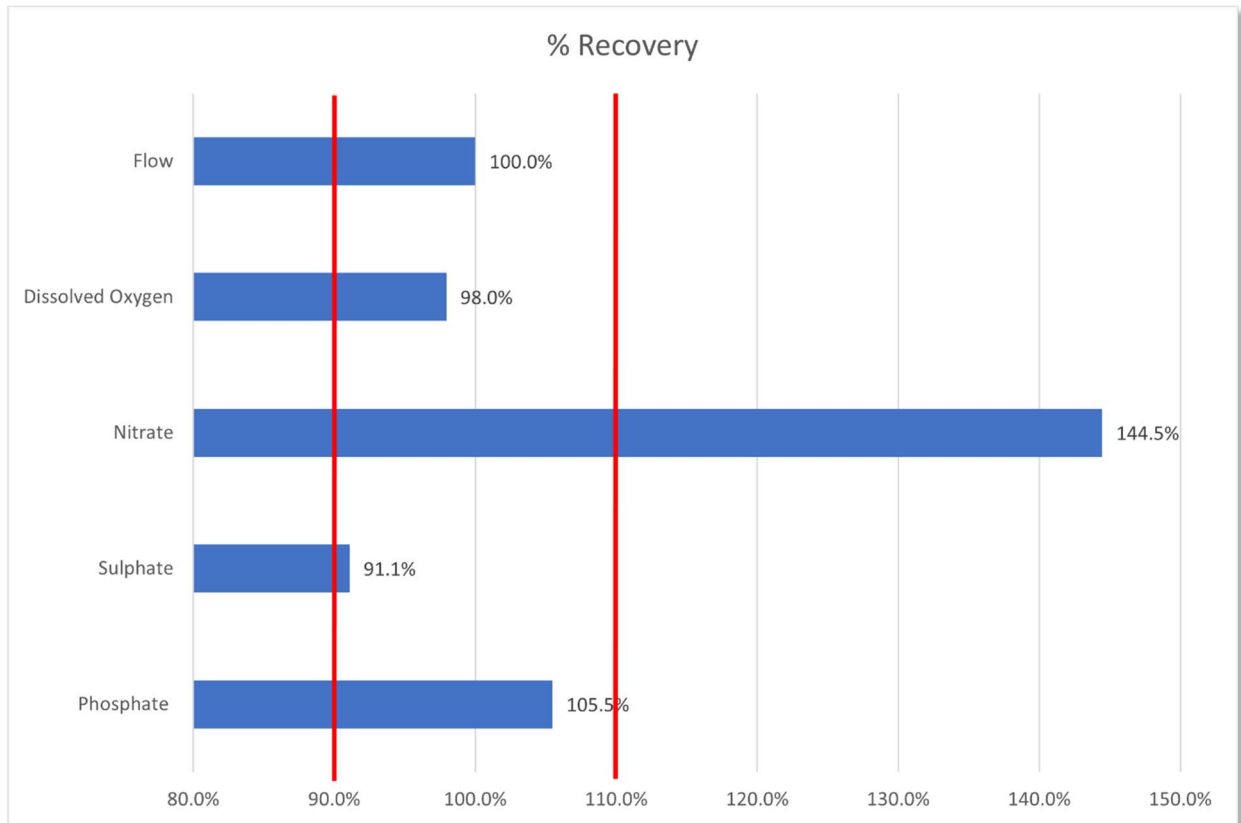
The Oakton meters are checked by calibrating them to check their functionality and to see if they need to be cleaned and/or have their heads replaced.

The same standard solutions are used to calibrate the Oakton meters with 24 hours of use, so the duplicate field tests of the Oakton meters serve as an indicator of how they perform. The relative percent difference (RPD) values will be published in the annual duplicate testing report at the end of the year.

We do not have standards for the dissolved oxygen or FlowWatch® meters but use the mean value to compare the variation between kits.

Results:

The goal for Percent Recovery is to be between 90 and 110 percent



The range (between the maximum and minimum recorded value) of the FlowWatch[®] meters for the frequency of calibration was not available, and the range of impeller flow velocity was near 0 cm/Sec. The range of the YSDI dissolved oxygen meters was 0.60 mg/L.

Conclusion:

Only the nitrate result was significantly higher than the goal. It was 34.5 percent above the accepted goal. Given that the 11 nitrate data values had

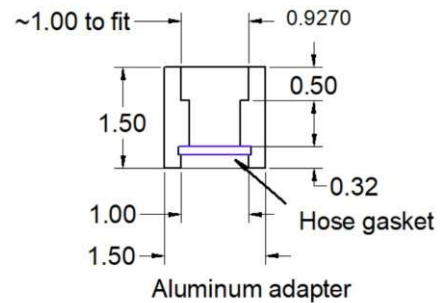
a standard deviation of less than 1, it is possible that the standard solution was too low for the high nitrate test..

The Field teams were reminded to inspect their equipment before use in accordance with our protocol.

Our protocol* calls for the teams to inspect the Oakton meter probe, dissolved oxygen probe, colorimeter sample cell cavity and the flow meter turbine (impeller) before use.

*See “Equipment Precautions and Maintenance” under our website: “Hot Training Tips”.

FLOWATCH® Impeller test adapter



We made the custom fitting for the *FLOWATCH*® impeller using a brass garden hose adapter and machining a short piece of an aluminum bar. The hose fitting was epoxied to the aluminum adapter.

The test procedure is to attach the fixture to a sink faucet. Set the flow to approximately 100 Cubic cm/sec. Hold the flow impeller against the adapter gasket and record the average meter velocity reading (cm/sec).