

Petition to Amend N.J.A.C. 7:18 – 5.5(C)1

Petitioner: David A. Bossie for In-Situ, Inc.
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The nature of the rulemaking which is requested is a change in a quality control requirement that will keep pace with current technology. The petition seeks to amend N.J.A.C. 7:18 – 5.5(C)1; specifically, a requirement that dissolved oxygen instruments be tested weekly against a Winkler titration. This antiquated requirement was designed to identify inaccurate instruments which use membrane technology to measure dissolved oxygen. The membrane, or Clark Cell method, uses a thin, flexible membrane, which is notorious for undergoing surface-chemistry changes. These surface-chemistry changes necessitate frequent calibration and QA checks.

In contrast, calibration stability data show the requirement for weekly Winkler's titration as a check against sensors using optical technology is unnecessary and unduly burdensome. Optical technology is extremely stable; validation studies demonstrated changes in calibrations of as little as <0.1 mg/L over the recommended calibration period of one year. Winkler's titration has associated errors which can lead to greater uncertainty than the optical sensor. The analyst's laboratory skills, the purity of the reagents and titrant, the determination of the end-point and the calculation of the concentration of dissolved oxygen can all lead to an inaccurate prediction of DO. If the purity of the potassium bi-iodate used to prepare the calibration solution is unknowingly low, the molarity of the standardized sodium thiosulfate titrant will be low. If the sodium thiosulfate titrant's concentration is low, the calculated dissolved oxygen in the sample will be higher than the true value. In-Situ's optical sensor is calibrated based on the phase shift observed in the measurement of the luminescence emitted when a blue LED strikes a lumiphore. The resulting luminescence is measured against a reference LED. There are no reagents, analyst's skills, manual calculations or subjective end-point associated with the technology.

Checking a sensor as stable as the RDO against a process as susceptible to error as Winkler's titration is backwards. Winkler's titration results should be checked against the RDO.

The petitioner is requesting the following amendment to 7:18-5.5(c)1:

Existing Regulation:

1. The laboratory shall calibrate dissolved oxygen instruments against air or air saturated water before each use or weekly, whichever is less frequent. The laboratory shall test dissolved oxygen instruments weekly using the Winkler method (azide modification) 4500-OC set forth in SM-18 or ASTM method D88-92(A), or another Winkler method promulgated by the USEPA.

Suggested Amendment:

1. The laboratory shall calibrate dissolved oxygen instruments, optical or membrane, against air or air saturated water before each use or weekly, whichever is less frequent.
 - a. For Clark Cell or membrane equipped instruments, the laboratory shall test the instruments weekly using the Winkler method (azide modification) 4500-OC set forth in

SM-18 or ASTM method D88-92(A), or another Winkler method promulgated by the USEPA.

- b. For optical dissolved oxygen sensors, the laboratory shall test the instruments quarterly using the Winkler method (azide modification) 4500-OC set forth in SM-18 or ASTM method D88-92(A), or another Winkler method promulgated by the USEPA.

One goal of requesting this petition is the reduction of waste. The proposed amendment will help alleviate the waste associated with performing Winkler's titrations. This is not limited to the small amount of *physical* waste from the reagents used in a titration, but rather the waste associated with the entire *process*. A New Jersey environmental consultant already has a significant paperwork load associated with complying with NJAC requirements. Lessening the paperwork is one type of reduction of waste, albeit a small one. In addition, when a weekly Winkler's titration is required, every week In-Situ must run the titration and ship the sensor to the customer overnight. This wastes fuel, time and money. The waste of fuel is significant: a truck must drive to In-Situ in Colorado, then drive the package to the airport where a plane flies it to New Jersey; another truck then takes the package from the airport to the customer's office. Additionally, the waste of time of the environmental consultant does nothing positive for the environment. The time a consultant spends getting the weekly sensor delivery, driving to the worksite and installing the new sensor is time that could be better spent on work that will have a more lasting, valuable environmental impact. Let's not lose sight of the important work the consultants do: their mission is the protection of our water, our most precious and irreplaceable resource. Allowing these consultants more time for data analysis and planning will result in the protection of our environment.

Another reason for requesting the petition be granted is to reduce the financial burden the regulation places on In-Situ and their New Jersey customers. The burden would be gladly bore if the Winkler's titration added any value to the process, but, again, it adds nothing when the sensor uses optical technology.

The petitioner's interest in this request is two-fold: to make it possible for In-Situ to offer New Jersey-based environmental consultants a very high level of service, and of course, a financial interest. In-Situ and their customers will benefit from an amendment to this regulation by controlling costs. Additionally, this amendment will enable us to deliver outstanding service to New Jersey's environmental consultants; a level of service we are challenged to provide when we comply with the regulation as it is currently written.

The statutory authority under which the Department of Environmental Protection may take the requested action is N.J.S.A. 13:1D-1 et seq., 53:14B-1 et seq., and Executive Order No. 34 (1976) in accordance with N.J.A.C. 7:1D.

Respectfully submitted March 22, 2017.

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