

# **STANDARD OPERATING PROCEDURE FOR SECCHI READINGS**

## **WILLARD SPUR 2011 MONITORING ACTIVITIES**

State of Utah  
Department of Environmental Quality  
Division of Water Quality

Revision 1  
Effective 9/9/2011

*Utah Division of Water Quality (DWQ) Standard Operating Procedures (SOPs) are adapted from published methods, or developed by in-house technical experts. The primary purpose of this document is for internal DWQ use. This SOP should not replace any official published methods.*

*Any reference within this document to specific equipment, manufacturers, or supplies is only for descriptive purposes and does not constitute an endorsement of a particular product or service by the author or by DWQ. Additionally, any distribution of this SOP does not constitute an endorsement of a particular procedure or method.*

*Although DWQ will follow this SOP in most instances, there may be instances in which DWQ will use an alternative methodology, procedure, or process.*

**REVISION PAGE**

Date	Revision #	Summary of Changes	Sections	Other Comments
09/09/2011	1	not applicable	not applicable	Previous version was put into new standardized format, began document control/revision tracking

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## **1.0 SCOPE AND APPLICABILITY**

This document presents the Utah Division of Water Quality's (DWQ) Standard Operating Procedure (SOP) for performing Secchi disk measurements (Secchi readings) in lakes and reservoirs. This SOP will also be used for sampling water clarity in Willard Spur. This SOP applies to all DWQ field staff, non-DWQ cooperators, and citizen volunteers.

Secchi disk readings are essentially a measure of transparency and give an indication of water clarity. The DWQ uses this data in several ways. As an important indicator for lake water quality assessment, Secchi readings can allude to algae and/or suspended sediment concentrations. Secchi reading values are one component used to calculate the Carlson Trophic State Index, a measure of the degree of eutrophication in a lake/reservoir/Willard Spur. The depth of the Secchi reading also determines the depth where surface water samples are to be collected.

## **2.0 SUMMARY OF METHOD**

The Secchi disk is lowered into the water until it disappears from view. The depth at which the Secchi disk vanishes and then reappears is the Secchi reading. The sampler takes the reading on the sunny side of the boat without wearing sun glasses.

## **3.0 HEALTH AND SAFETY WARNINGS**

Field personnel should take appropriate precautions when operating watercraft and working on, in, or around water. All boats should be equipped with safety equipment such as personal flotation devices (PFD's), oars, air horn, etc. Utah's Boating Laws and Rules shall be followed by all field personnel.

Field personnel should be aware that hazardous conditions potentially exist at every waterbody. If unfavorable conditions are present at the time of sampling, the sample visit is recommended to be rescheduled. If hazardous weather conditions arise during sampling, such as lightning or high winds, personnel should cease sampling and move to a safe location.

## **4.0 CAUTIONS**

Watercraft must be stationary while performing Secchi readings. A moving watercraft will produce invalid readings because the Secchi disk will not be aligned vertically in the water column. An additional anchor may be needed to further secure watercraft. Extreme wave action may also produce invalid readings. In these cases, round the Secchi reading to the nearest 0.1 meter, making sure to note the field conditions on a field sheet or in a field notebook.

## **5.0 INTERFERENCES**

Several factors may affect the Secchi reading. Since the eyesight of samplers may vary, all readings on the same waterbody should come from the same person. Weather conditions and site conditions (e.g. overcast skies, water surface scum, dark-colored water, etc.) should be recorded so that outlier readings may be explained.

## **6.0 PERSONNEL QUALIFICATIONS/RESPONSIBILITIES**

All personnel taking Secchi readings must read this SOP annually and acknowledge they have done so via a signature page (see **Appendix**). New field personnel must also demonstrate successful performance of the method. The signature page will be signed by both trainee and trainer to confirm that training was successfully completed and that the new monitor is competent in carrying out this SOP. The signature page will be kept on-file at DWQ along with the official hard copy of this SOP.

## **7.0 EQUIPMENT AND SUPPLIES**

A Secchi disk is made out of a 20 cm diameter Plexiglass disk painted with four alternating black and white quadrants. This disk is attached to a metered tape by a series of nuts and bolts. The tape is marked off in meters (subdivided by tenths of meters). Before use, make sure the markings are still clearly visible.

## **8.0 PROCEDURE**

Upon arrival to the sample site, establish which sampler is going to perform the Secchi reading(s).

- 1) Retrieve the Secchi disk from storage.
- 2) Move to the sunny side of the boat and wait for the boat to be as stationary as possible before lowering the Secchi disk.
- 3) With sunglasses off, lower the disk slowly; make sure the tape is straight up and down.
- 4) Lower the Secchi disk to the point of vanishing and slowly raise it back up until it reappears. Move the disk up and down until the exact vanishing/reappearing point is found. At this point, read the tape where it is entering the water; this is the Secchi reading. One can visually read the tape or use your hand to mark the tape where it meets the water's surface.
- 5) Pull the disk out of the water and record the tape measurement to the nearest 0.1 meter.

## **9.0 DATA AND RECORDS MANAGEMENT**

Secchi readings will be recorded on the lab sheet. Once personnel reach the laboratory to drop off samples, all lab sheets will be scanned and saved into the DWQ Monitoring Section shared folder titled "Willard Spur". These lab sheets hold important information that will be kept with the sampling trip data including sample depths, Secchi readings, sampling time, etc. Data management staff will review these sheets on a biweekly basis.

## **10.0 QUALITY ASSURANCE AND QUALITY CONTROL**

There are limited QA/QC procedures for Secchi readings. Duplicate readings may be performed on sites that have duplicates established or two readings may be averaged by the sampler, if desired. For quality control, Secchi readings should be taken by one person for an entire sampling trip.

## **11.0 REFERENCES**

Not applicable to this SOP.



