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Scattering Meter Calibration Sheet

07/28/04 Customer: Webb Research Corporation
Wavelength: 660 S/N#: BBFL2SLO-136 Job #: 406005 Tech: MJ

Use the following equation to obtain "scaled" output values:

$$\beta(\theta c)\ m^{-1}\ sr^{-1} = \text{Scale Factor} \times (\text{Output} - \text{Dark Counts})$$

• **Scale Factor for 660 nm**	=	4.11E-06	(counts)	
• **Output**	=	meter output	(counts)	
• **Dark Counts**	=	58	(counts)	
Instrument Resolution	=	0.9892	(counts)	4.07E-06 ($m^{-1}\ sr^{-1}$)

Definitions:

- **Scale Factor**: Calibration scale factor, β(θc)/counts. Refer to User's Guide for derivation.
- **Output**: Measured signal output of the scattering meter.
- **Dark Counts**: Signal obtained by covering detector with black tape and submersing sensor in water.

Instrument Resolution: Standard deviation of 1 minute of collected data.

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ECO CDOM Fluorometer Characterization Sheet

Date: 7/28/2004 Customer: Webb Research Corp.

Job #: 406005 S/N#: BBFL2SLO-136

CDOM (Quinine Dihydrate Equivalent) concentration expressed in ppb can be derived using the equation:

CDOM (QSDE) = Scale Factor * (Output - Clean Water Offset)

	Digital	
Clean Water Offset (CWO)	71	counts
Scale Factor (SF)	0.0840	ppb/l/count
Maximum Output	4123	counts
Resolution	1.6433	counts
Ambient temperature during characterization	23.3	℃

CWO: Clean Water Offset value obtained using pure filtered de-ionized water.

SF: Determined using the following equation: SF = *x* ÷ (output - CWO), where *x* is the concentration of the solution used during instrument characterization. SF is used to derive instrument output concentration from the raw signal output of the fluorometer.

Maximum Output: Maximum signal output the fluorometer is capable of.

Resolution: Standard deviation of 1 minute of collected data.

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ECO Chlorophyll Fluorometer Characterization Sheet

Date: 07/28/04 Customer: Webb Research Corp.

Job #: 406005 S/N#: BBFL2SLO-136

Chlorophyll concentration expressed in µg/l can be derived using the equation:

CHL (µg/l) = Scale Factor * (Output - Clean Water Offset)

Clean Water Offset (CWO)	58	counts
Chl. Equivalent Concentration (CEC)	1873	counts
Scale Factor (SF)	0.0129	µg/l/count
Maximum Output	4122	counts
Resolution	1.0750	counts
Ambient temperature during characterization	23.3	℃

CWO: Clean Water Offset value obtained using pure filtered de-ionized water.

CEC Signal output of the fluorometer when using a fluorescent proxy that has been determined to be approximately equivalent to 25 µg/l of a *Thalassiosira weissflogii* phytoplankton culture.

SF: Used to derive chlorophyll concentration from the signal output of the fluorometer. The scale factor is determined using the following equation: SF = 25 ÷ (CEC - CWO). For example: 25 ÷ (2865 - 43.5) = 0.00886.

Maximum Output: Maximum signal output the fluorometer is capable of.

Resolution: Standard deviation of 1 minute of collected data.

The relationship between fluorescence and chlorophyll-a concentrations in-situ is highly variable. The scale factor listed on this document was determined using a mono-culture of phytoplankton (Thalassiosira weissflogii). The population was assumed to be reasonably healthy and the concentration was determined by using the absorption method. To accurately determine chlorophyll concentration using a fluorometer, you must perform secondary measurements on the populations of interest. This is typically done using extraction-based measurement techniques on discrete samples. For additional information on determining chlorophyll concentration see "Standard Methods for the Examination of Water and Wastewater" part 10200 H, published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation.