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Dispersed Crude Oil Fluorometer Characterization Sheet

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

Crude oil concentration expressed in ppb can be derived using the equation:

Dispersed Crude Oil (PPB) = Oil Scale Factor * (Output - Dark counts)

Dark counts		**49** counts			
Dark counts range	min:	46 counts	max:	52 counts	
Oil Scale Factor (SF)				**2.2** ppb/count	
Maximum Output		160000 counts			
Resolution		1.4 counts		3.1 ppb oil	
Specified Range			min:	200000 ppb oil	
Maximum Range (see note below)				344183 ppb oil	

- **Output**: Measured signal output of the instrument.
- **Dark Counts**: Average of the signal obtained by covering the optics with black tape and submersing the sensor in water.
- **Oil Scale Factor**: The oil characterization is for a dispersed oil similar to the Macondo crude oil from the Deepwater Horizon spill. The composition of the oil and degree of dispersion, i.e. the droplet size distribution and dissolved fraction, will impact the signal to mas concentration relationship. Best results will be obtained with a calibration of the instrument with the oil and water at the site with in-situ grab samples.
- **Maximum Output**: Maximum potential scaled output of the instrument. This value is general greater than the specified range.
- **Resolution:** Standard deviation of 1 minute of collected dark count data after 15 minutes of warm-up. For standard deviations less than one, the reported resolution in counts is rounded up to one.
- **Note**: This dispersed crude oil characterization is based on the relationship between QSDE response and dispersed Macondo oil concentrations as detailed in Conmy et al., 2014 Figure 3.

Note on Oil Calibration:

Caution should be exercised in using this calibration for specific oils, injection methods and dispersent to oil ratios. As with optical calibrations of biogeochemical parameters such as chlorophyll concentration via fluorescence and particle concentration from backscattering or beam attenuation, the range of natural variability suggests that factory calibrations should be supplemented by co-located grab samples and regression analysis.

Note on Maximum Output:

The maximum number of counts that the instrument can output is approximately 160,000. In most natural waters, the potential range of the instrument is greater than the measureable range due to the interference factor, e.g. the absorbance length scale. Caution should be used for data sets in which the reported values exceed the specified range. Grab samples should be used to confirm values above the specified range.