

Turbidity Monitoring System

A turbidity monitoring system shall be provided to monitor the turbidity in real-time at (*Specify Location*) during dredging and/or construction activities.

Data Buoy

The turbidity monitoring system shall consist of (*Specify Quantity*) data buoy platforms located upstream and downstream of the dredging/construction site.

The data buoy flotation shall be constructed of a closed cell, cross-linked polyethylene foam hull with a polyurea skin and Kevlar reinforced top coat providing 450 lbs of buoyancy. The flotation shall be yellow in color in accordance with international data buoy standards.

The data buoy structure shall consist of an internal type 304 stainless steel frame, (3) topside lifting eyes and subsurface mooring eyes for both single-point and two-point moorings. The frame shall support attachment of instrument mounting cages directly below the center of the buoy.

The data buoy shall be fitted with an integral data well providing adequate space for batteries and instrumentation. Both feed-through gland fittings and watertight connectors shall be available on an O-ring sealed lid.

The data buoy shall allow adequate topside space to accommodate various telemetry modules including radio, cellular, Iridium satellite and WiFi.

The data buoy shall be fitted with (3) 10-watt solar panels with a waterproof termination for charging (2) 28 A-Hr batteries.

The data buoy shall support mounting of both topside and subsurface sensors. A top plate shall be pre-drilled for mounting a 1-3 nautical mile range LED beacon, weather station mast and other sensor supports. The plate shall accommodate passage of multiple sensor cables and connectors up to 1.5 inches in diameter.

(3) 4-inch pipes, each with 4-inch NPT female threaded fitting, shall allow sensor pass-through and accommodate deployment pipes below the buoy. Hatches shall cover the passages and conceal cables.

The complete data buoy shall be Series CB-450 as manufactured by NexSens Technology, Inc. or approved equal.

Turbidity Instrument

The turbidity monitoring system shall support (*Specify Quantity*) turbidity sensors mounted at (*Specify Depth*) in the water column.

The turbidity instrument shall be capable of operating in water depths up to 250 meters.

The turbidity instrument shall not exceed 3.0" in diameter, 28" in length and 6 lbs. in standard weight.

The turbidity instrument shall be a platform with universal ports that can accommodate a variety of sensors, which can be used or reconfigured at any time by the end user in the field. Similarly, the sensors shall have hermaphroditic wet-mateable connectors, allowing them to be plugged interchangeably into any sensor port.

The turbidity instrument shall be designed to withstand the harsh conditions of field use by using rugged materials, including Titanium, laser-welded probe housings to resist leaks; wet-mateable connectors that resist corrosion; impact-resistant and chemical-resistant Xenoy polymer reinforced housing; and sapphire glass on optical sensor windows.

The turbidity instrument shall be equipped with built-in Bluetooth wireless technology for cable-free communications when calibrating, communicating and downloading data. An internal magnetic switch and external activation key for wireless control of the Bluetooth radio shall be included.

The turbidity instrument shall be capable of having connectorized field-replaceable probes for Turbidity, Conductivity, Temperature, and the central wiper. These sensors shall be capable of being removed without opening the sonde or exposing the internal electronics to the environment.

The turbidity instrument sensors shall be "smart" and store all calibration data internally to the sensor. Sensors shall be able to swapped from one sonde to another or from one sonde port to another without recalibration.

The turbidity instrument shall be capable of measuring turbidity with a Nephelometric type probe capable of measuring turbidity from 0-4000 NTU. The sensor will have an accuracy of +/- 2% of reading or 0.3 NTUs (whichever is greater) in AMCO-AEPA Polymer standards from 0-999 NTU and an accuracy of +/- 5% of reading from 1000-4000 NTU.

The turbidity instrument shall be capable of measuring temperature using a NIST-traceable calibrated thermistor in the range of -5 to 50 degrees C with an accuracy of +/- 0.01 degrees C and a resolution of 0.01 degrees C from -5 to 35 degrees C and an accuracy of +/-0.05 degrees C

from 35 to 50 degrees C. Each temperature sensor must include a factory calibration/NIST reference sheet.

The turbidity instrument shall be capable of measuring conductivity using a four-electrode cell in the range of 0-200 mS/cm with an accuracy of +/- 0.5% or 0.001 mS/cm and a resolution of 0.001 to 0.1 mS/cm. Additionally, the cell design should prevent bubbles from settling on electrodes and interfering with measurements. The conductivity sensor must be a linear device requiring only a single-point calibration.

The turbidity instrument shall be capable of having a non-vented characterized depth sensor capable of measuring in the range of (*Specify 10m, 100m or 250m*) with an accuracy of +/- 0.04% FS and a resolution of 0.001 meters or feet.

The turbidity instrument shall provide antifouling protection with a central motorized wiper with rotating nylon-bristle brush that removes biofouling from all optical sensors. The wiper shall be protected from sediment accumulation by a wiper guard (aka parking garage). The wiper shall be field-serviceable and replaceable.

The turbidity instrument sensor ports shall have secondary backup seals, thus protecting the internal electronics from the environment.

The turbidity instrument shall include a titanium bulkhead to reduce the incidences of stripping threads and field replaceable titanium retaining nuts on sensors.

The turbidity instrument shall provide electrical overload protection to the individual sensors that will prevent data loss in the event that a single sensor experiences catastrophic failure.

The complete turbidity instrument shall be EXO2 as manufactured by YSI Inc./Xylem Inc. or approved equal.

Web Datacenter

The turbidity monitoring system shall include a web datacenter for project and data management.

The web datacenter shall provide 24/7 instant access to environmental data for project personnel.

The web datacenter shall allow users to be added as Administrators with the ability to edit the website theme, photos and descriptions or as Collaborators with access only to view data and submit forms.

The web datacenter shall have an interactive Google Maps interface that allows for quick viewing of the most recent site data.

The web datacenter shall display data in customizable graphical and tabular formats with the ability to save daily, weekly, and monthly reports.

The web datacenter shall have the ability to manually or automatically send data via email and FTP and to download data in an Excel-compatible CSV format.

The web datacenter shall allow configuration of alarms and alerts to notify project personnel via email or text message when parameters exceed defined threshold conditions.

The web datacenter shall provide a fieldbook module for storing project notes, images and calibration data.

The web datacenter shall have a compatible mobile application that can be used to sync field notes and calibration forms.

The web datacenter shall be a secure, password-protected website.

The web datacenter shall provide a public portal to grant limited access to the general public through a public website, slideshow presentation view or web applet.

The web datacenter shall provide a media archive for upload of site photos and videos.

The web datacenter shall be WQData LIVE from NexSens Technology, Inc. or approved equal.