***\*THIS GUIDANCE SHOULD NOT BE INCLUDED IN THE CONTRACT\****

*Annual QA checks are required by the DQM Support Center for each scow and, unless explicitly stated by the local USACE District, should be completed prior to material being moved. Instrumentation upgrades during the year necessitate an additional QA check.*

#### *When to Choose a Specific Profile*

*Use the following information to determine which profile to choose.*

#### *Monitoring Profile*

*The Monitoring Profile includes scow position, heading, hull status, draft sensors, and displacement tables to give a relative indication of when most of the material has left the scow (or the length of time the material takes to dump). Increases in draft can show digging locations and changes in loading can show leakage in gross relative terms.*

#### *Ullage Profile*

*The Ullage Profile contains all the instrumentation from the previous profile, adding ullage sensors and ullage volume tables. This profile may be used when dredging a material like mud, which will (for the most part) seek its own level, and ullage can be accurately measured to get an idea of bin volume.*

#### *Specification Revisions*

*This section tracks all additions, deletions, and other revisions made to this document.*

| ***Sec. No.*** | ***Original Text*** | ***Revised Text*** |
| --- | --- | --- |
| ***Revisions made 08-04-2023*** |
| *Through-out* | *All references to paragraph numbers* | *References to paragraph numbers were removed; references to paragraph titles remain.* |
| *1.2* | *Letter of National Dredging Quality Management Program Certification* | *National Dredging Quality Management Program Certification* |
| *1.3* | *PAYMENT (Not Applicable)* | *PAYMENTNot used.* |
| *1.4.1* | *—* | *1.4.1 Certification [Heading added]* |
| *1.4.1* | *Criteria for certification shall be based on the most recent specification posted on the DQM website (https://dqm.usace.army.mil). Compliance with these criteria shall be verified by onsite quality assurance (QA) checks conducted by the DQM Support Center Data Acquisition and Analysis Team and by periodic review of the transmitted data.* | Criteria for certification is based on the most recent specification posted on the DQM website (<https://dqm.usace.army.mil>). Verify compliance with these criteria by onsite quality assurance (QA) checks conducted by the DQM Support Center Data Acquisition and Analysis Team and by periodic review of the transmitted data. |
| *1.4.1* | *If issues with data quality are not corrected within 48 hours, the system certification shall be revoked and additional QA checks by the DQM Data Acquisition and Analysis Team may be necessary.* | If issues with data quality are not corrected within 48 hours, the system certification will be revoked and additional QA checks by the Data Acquisition and Analysis Team may be necessary. |
| *1.4.1* | *Annual DQM Certification shall be based on the following:* | *Annual DQM Certification must be based on the following:* |
| *1.4.2* | *—* | *1.4.2 Quality Assurance (QA) [Heading added]* |
| *1.4.2* | *The Dredging Contractor shall have personnel who are familiar with the system instrumentation and who have the ability to recalibrate the sensors on site during the QA process. The Dredging Contractor shall coordinate pickup times and locations and provide transportation to and from any platform with a DQM system to team personnel in a timely manner. The Dredging Contractor shall also have on site for the QA checks a tug capable of towing the scow.* | The Dredging Contractor must have personnel who are familiar with the system instrumentation and who have the ability to recalibrate the sensors on site during the QA process. The Dredging Contractor must coordinate pickup times and locations and provide transportation to and from any platform with a DQM system to team personnel in a timely manner. The Dredging Contractor must also have on site for the QA checks a tug capable of towing the scow. |
| *1.4.2* | *If additional safety equipment is needed—such as eye protection, safety harnesses, work gloves or personal location beacons—these items shall be provided to the team while on site. The Contractor shall submit a test data package to the DQM database from the system on each scow and have it accepted by the DQM Support Center prior to scow compliance checks. The Contractor shall also submit data collected during the QA checks from the scow monitoring system to the DQM database and the DQM Data Acquisition and Analysis Team personnel while on site.* | If additional safety equipment is needed—such as eye protection, safety harnesses, work gloves, or personal location beacons—provide these items to the team while on site. Submit a test data package to the DQM database from the system on each scow and have it accepted by the DQM Support Center prior to scow compliance checks. Also submit data collected during the QA checks from the scow monitoring system to the DQM database and the DQM Data Acquisition and Analysis Team personnel while on site. |
| *1.4.2* | *The owner or operator of the scow shall contact DQM at DQM-AnnualQA@rpsgroup.com on an annual basis, or at least three weeks prior to the proposed beginning of dredging, to schedule QA checks.* | The owner or operator of the scow must contact DQM at DQM-AnnualQA@rpsgroup.com on an annual basis, or at least three weeks prior to the proposed beginning of dredging, to schedule QA checks. |
| *1.4.2* | *At least one week prior to the target date, the Dredging Contractor shall contact the Data Acquisition and Analysis Team and verbally coordinate a specific date and location. The Contractor shall then follow up this conversation with a written email confirmation. The owner/operator shall coordinate the QA checks with all local authorities including, but not limited to, the local USACE permitting officer.* | At least one week prior to the target date, the Dredging Contractor must contact the Data Acquisition and Analysis Team and verbally coordinate a specific date and location. The Contractor must then follow up this conversation with a written email confirmation. The owner/operator must coordinate the QA checks with all local authorities including, but not limited to, the local USACE permitting officer. |
| *1.4.3* | *—* | *1.4.3 Recertification [Heading added]* |
| *1.4.3* | *Recertification is required for any yard work which produces modification to displacement (for example, a change in scow lines, or repositioning or repainting hull marks), modification to bin volume (change in bin dimensions, or addition or subtraction of structure), or changes in sensor type or location; these changes shall be reported in the sensor log section of the DPIP. A system does not have to be transmitting data between jobs; however, in order to retain certification during this period, the system sensors or hardware should not be disconnected or removed from the scow. If the system is powered down, calibration coefficients shall be retained.* | Recertification is required for any yard work which produces modification to displacement (for example, a change in scow lines, or repositioning or repainting hull marks), modification to bin volume (change in bin dimensions, or addition or subtraction of structure), or changes in sensor type or location; report these changes in the sensor log section of the DPIP. A system does not have to be transmitting data between jobs; however, in order to retain certification during this period, the system sensors or hardware should not be disconnected or removed from the scow. If the system is powered down, retain calibration coefficients.  |
| *1.5* | *The Contractor shall have a digital copy of the DPIP on file with the DQM Support Center. While working on site, the Contractor shall also maintain on the dredge a copy of the DPIP which is easily accessible to Government personnel at all times. This document shall describe the sensors used, configuration of the system, how sensor data will be collected, how quality control on the data will be performed, and how sensors/data reporting equipment will be calibrated and repaired if they fail. A description of computed scow specific data and how the sensor data will be transmitted to the DQM Database shall also be included.* | The Contractor must have a digital copy of the DPIP on file with the DQM Support Center. While working on site, the Contractor must also maintain on the dredge a copy of the DPIP which is easily accessible to Government personnel at all times. This document must describe the sensors used, configuration of the system, how sensor data will be collected, how quality control on the data will be performed, and how sensors/data reporting equipment will be calibrated and repaired if they fail. A description of computed scow-specific data and how the sensor data will be transmitted to the DQM database must also be included. |
| *1.5* | *The Contractor shall submit to the DQM Support Center any addendum or modifications made to the plan, subsequent to its original submission, prior to start of work. Any changes to the computation methods shall be approved by the DQM Support Center prior to their implementation.* | Submit to the DQM Support Center any addendum or modifications made to the plan, subsequent to its original submission, prior to the start of work. Any changes to the computation methods must be approved by the DQM Support Center prior to their implementation. |
| *PART 2* | *PRODUCTS (NOT APPLICABLE)* | *PRODUCTSNot used.* |
| *3.1* | *The Contractor shall provide, operate and maintain all hardware and software to meet these specifications. The Contractor shall be responsible for replacement, repair, and calibration of sensors and other necessary data acquisition equipment needed to supply the required data.*  | Provide, operate, and maintain all hardware and software to meet these specifications. The Contractor is responsible for replacement, repair, and calibration of sensors and other necessary data acquisition equipment needed to supply the required data. |
| *3.1* | *Repairs shall be completed within 48 hours of any sensor failure. Upon completion of a repair, replacement, installation, modification, or calibration the Contractor shall notify the Permit Project Manager.* | Complete repairs within 48 hours of any sensor failure. Notify the Permit Project Manager upon completion of a repair, replacement, installation, modification, or calibration. |
| *3.1* | *The Contractor shall keep a log of sensor repair, replacement, installation, modification and calibration in the onsite copy of the DPIP. The log shall contain a three-year history of sensor maintenance, including the time of sensor failures (and subsequent repairs), the time and results of sensor calibrations, the time of the sensor replacements, and the time that backup sensor systems were initiated to provide required data. It shall also contain the name of the person responsible for the sensor work.*  | Keep a log of sensor repair, replacement, installation, modification and calibration in the onsite copy of the DPIP. The log must contain a three-year history of sensor maintenance, including the time of sensor failures (and subsequent repairs), the time and results of sensor calibrations, the time of sensor replacements, and the time that backup sensor systems were initiated to provide the required data. It must also contain the name of the person responsible for the sensor work.  |
| *3.1* | *Sensors installed shall be capable of collecting parameters within specified accuracies and resolutions indicated in the following subparagraphs.* | Install sensors that are capable of collecting parameters within specified accuracies and resolutions indicated in the following subparagraphs. |
| *3.1.1* | *Each scow shall be assigned a unique name that will remain constant from one dredging operation to the next.*  | Assign each scow a unique name that will remain constant from one dredging operation to the next. |
| *3.1.3* | *A DQM load number shall document the end of a disposal event for a given scow.*  | A DQM load number must document the end of a disposal event for a given scow. |
| *3.1.4* | *Horizontal positioning shall be recorded as the geographic coordinates of the vessel as indicated by the location of the Global Positioning System (GPS) antenna. All locations shall be obtained using a positioning system operating with a minimum accuracy level of 1 to 3 meters horizontal Circular Error Probable (CEP). Positions shall be reported as Latitude/Longitude WGS 84 in decimal degrees.* | Record horizontal positioning as the geographic coordinates of the vessel as indicated by the location of the Global Positioning System (GPS) antenna. Obtain all locations using a positioning system operating with a minimum accuracy level of 1 to 3 meters horizontal Circular Error Probable (CEP). Report positions as Latitude/Longitude WGS 84 in decimal degrees. |
| *3.1.5* | *The date and time shall be reported to the nearest second and referenced to Universal Time Coordinated (UTC) time based on a 24-hour format: yyyy-mm-dd hh:mm:ss.* | Report the date and time to the nearest second and referenced to Universal Time Coordinated (UTC) based on a 24-hour format: yyyy-mm-dd hh:mm:ss. |
| *3.1.6* | *For this contract, hull status shall register closed prior to leaving the disposal area.* | For this contract, hull status must register closed prior to leaving the disposal area. |
| *3.1.6.1* | An open split hull or open bottom door of a scow shall be indicated by reporting an “OPEN” value. A closed split hull or closed bottom door of a scow shall be indicated by reporting a “CLOSED” value. An open status shall be indicated as the bin starts to open, and a closed status shall be indicated only once the bin is fully closed. For pocket scows, the open/closed status shall correspond to the compartment which is first to open and last to close.  | Indicate an open split hull or open bottom door of a scow by reporting an “OPEN” value. Indicate a closed split hull or closed bottom door of a scow by reporting a “CLOSED” value. An open status must be indicated as the bin starts to open, and a closed status must be indicated only once the bin is fully closed. For pocket scows, the open/closed status must correspond to the compartment which is first to open and last to close. |
| *3.1.7* | When offloading is occurring, a value of “true” shall be reported; otherwise, a “false” value shall be reported. | *When offloading is occurring, report a value of “true”; otherwise, report a “false” value.*  |
| *3.1.8* | Scow course-over-ground (COG) shall be provided using industry standard equipment. The Contractor shall provide scow course-over-ground (to the nearest whole degree) with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.  | Provide scow course-over-ground (COG) using industry-standard equipment. Provide scow course-over-ground (to the nearest whole degree) with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention. |
| *3.1.9* | Scow speed-over-ground shall be provided in knots using industry standard equipment with a minimum accuracy of 1.0 knot and resolution to the nearest 0.1 knot. | Provide scow speed-over-ground in knots using industry standard equipment with a minimum accuracy of 1.0 knot and resolution to the nearest 0.1 knot. |
| *31.10* | Scow heading shall be provided using industry-standard equipment. The scow heading shall be accurate to within 5 degrees and reported to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention. | Provide scow heading using industry-standard equipment. The scow heading must be accurate to within 5 degrees and reported to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention. |
| *3.1.11* | All reported draft measurements shall be in feet, tenths, and hundredths with an accuracy of + 0.1 foot relative to observed physical draft readings. The measurements shall be reported at a resolution of two decimal places (hundredths of a foot). The reported forward draft value shall be equal to the sum of the visual forward port and starboard draft mark readings divided by two. The reported aft draft value shall be equal to the sum of the visual aft port and starboard draft mark readings divided by two. Forward draft, aft draft, and average draft will be reported. Sensors shall be placed at an optimum location on the scow to be reflective of observed physical draft mark readings at any trim or list. Minimum accuracies are conditional to relatively calm water. The sensor value reported shall be an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged. When the average draft is calculated for the purpose of determining displacement, significant digits for average draft shall be maintained such that if forward draft was 0.15 and aft draft was 0.1, then the average draft would be 0.125. | Report all draft measurements in feet, tenths, and hundredths with an accuracy of + 0.1 foot relative to observed physical draft readings. Report the measurements at a resolution of two decimal places (hundredths of a foot). The reported forward draft value must be equal to the sum of the visual forward port and starboard draft mark readings divided by two. The reported aft draft value must be equal to the sum of the visual aft port and starboard draft mark readings divided by two. Forward draft, aft draft, and average draft will be reported. Place sensors at an optimum location on the scow to be reflective of observed physical draft mark readings at any trim or list. Minimum accuracies are conditional to relatively calm water. The reported sensor value is an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged. When the average draft is calculated for the purpose of determining displacement, maintain significant digits for average draft such that if forward draft were 0.15 and aft draft were 0.1, then the average draft would be 0.125. |
| *3.1.2* | Scow displacement shall be reported in long tons, based on the most accurate method available for the scow. The minimum standard of accuracy for displacement is interpolation from the displacement table, based on the average draft. For this contract the density of water used to calculate displacement shall be\_\_\_\_\_\_\* kg/cubic meter, and shall be used for an additional interpolation between the fresh and salt water tables. | Report scow displacement in long tons, based on the most accurate method available for the scow. The minimum standard of accuracy for displacement is interpolation from the displacement table, based on the average draft. For this contract the density of water used to calculate displacement is **\_\_\_\_\_\_\*** kg/cubic meter, and is used for an additional interpolation between the fresh and salt water tables. |
| *3.1.13* | All reported ullage soundings shall be in feet, tenths, and hundredths with an accuracy of + 0.1 foot with respect to the combing and be representative of the forward and aft extents of the hopper as close to the centerline as is possible. The measurements shall be reported at a resolution of two decimal places (hundredths of a foot). If sensors must be offset from the centerline of the bin they should be offset to opposite sides of the vessel. Forward ullage, aft ullage, and average ullage soundings will be reported. The sensor value reported shall be an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged. When average ullage is calculated for the purpose of determining hopper volume, significant digits for average ullage shall be maintained such that if forward ullage were 0.15 and aft ullage were 0.1, then the average ullage would be 0.125. Special arrangements for pocket scows may be made in consultation with the DQM Support Center.  | *Report all ullage soundings in feet, tenths, and hundredths with an accuracy of + 0.1 foot with respect to the combing and be representative of the forward and aft extents of the hopper as close to the centerline as is possible. Report the measurements at a resolution of two decimal places (hundredths of a foot). If sensors must be offset from the centerline of the bin they should be offset to opposite sides of the vessel. Forward ullage, aft ullage, and average ullage soundings will be reported. The reported sensor value is an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged. When the average ullage is calculated for the purpose of determining the hopper volume, maintain significant digits for the average ullage such that if the forward ullage were 0.15 and the aft ullage were 0.1, then the average ullage would be 0.125. Special arrangements for pocket scows may be made in consultation with the DQM Support Center.* |
| *3.1.14* | Scow bin volume shall be reported in cubic yards based on the most accurate method available for the scow. | Report scow bin volume in cubic yards based on the most accurate method available for the scow. |
| *3.2* | The Contractor’s DQM system shall be capable of collecting, displaying, and transmitting information to the DQM database. The parameters which shall be reported to the DQM database include trip number, date and time, hull status, offloading status, scow course, scow speed, scow heading, draft, displacement, ullage, and bin volume. An easily accessible, permanent visual display on the scow shall show in real time the parameters collected by the system in the same units as are used for data submitted to the DQM database. In the event a reported parameter is calculated based on multiple sensors, the sensor values as used in the equation shall be able to be viewed in addition to the required parameter. If a hardware problem occurs, or if a part of the system is physically damaged, then the Contractor shall be responsible for repairing it within 48 hours of determination of the condition. | The Contractor’s DQM system must be capable of collecting, displaying, and transmitting information to the DQM database. The parameters which must be reported to the DQM database include trip number, date and time, hull status, offloading status, scow course, scow speed, scow heading, draft, displacement, ullage, and bin volume. Provide an easily accessible, permanent visual display on the scow to show in real time the parameters collected by the system in the same units as the data submitted to the DQM database. In the event a reported parameter is calculated based on multiple sensors, the sensor values as used in the equation must be able to be viewed in addition to the required parameter. If a hardware problem occurs, or if a part of the system is physically damaged, the Contractor is responsible for repairing it within 48 hours of determination of the condition. |
| *3.2.1* | The Contractor may select any commercial satellite, cellular phone, or other data communications systems available, as long as it is capable of transmitting real time data, as well as enough additional bandwidth to clear historically queued data when a connection is reobtained. If connectivity is lost, unsent data shall be queued and transmitted upon restoration of connectivity. Delays in pushing real-time data to the DQM database shall not exceed four hours. | The Contractor may select any commercial satellite, cellular phone, or other data communications systems available as long as it is capable of transmitting real-time data as well as enough additional bandwidth to clear historically queued data when a connection is reobtained. If connectivity is lost, queue and transmit unsent data upon restoration of connectivity. Delays in pushing real-time data to the DQM database should not exceed four hours. |
| 3.2.1 | The data transition process from the scow to the DQM database must be automated. The data may be sent from the scow directly to the DQM database or to a shore based computer. Data transmitted to the DQM database should be raw data; any processing of the data conducted shoreside shall be done using repeatable automated software or programming routine. A description of this process shall be included in the DPIP. | The data transmission process from the scow to the DQM database must be automated. The data may be sent from the scow directly to the DQM database or to a shore-based system. Data transmitted to the DQM database should be raw data; use a repeatable automated software or programming routine to process any shoreside data. Include a description of this process in the DPIP. |
| 3.2.2 | Disposal activities shall be logged with high temporal and spatial resolution. Data shall be logged as a series of events. Each set of measurements (time, position, etc.) will be considered an event. Any required information in Paragraph 3.1, “Requirements for Reported Data,” that is not an averaged variable (that is, draft and ullage) shall be collected within 1 second of the reported time. Data shall be measured with sufficient frequency by the scow system to resolve the events to the accuracy specified in the following table. Any averaged variable must be collected and computed within this sampling interval. Reporting intervals shall be consistent and should not change for the data collected on a given scow. This interval should be documented by the Contractor in the DPIP. | Log disposal activities with high temporal and spatial resolution. Log data as a series of events. Each set of measurements (time, position, etc.) will be considered an event. Collect any required information in paragraph REQUIREMENTS FOR REPORTED DATA that is not an averaged variable (that is, draft and ullage) within 1 second of the reported time. Measure data with sufficient frequency by the scow system to resolve the events to the accuracy specified in the following table. Any averaged variable must be collected and computed within this sampling interval. Reporting intervals must be consistent and not change for the data collected on a given scow. This interval should be documented by the Contractor in the DPIP. |
| 3.2.2 | Between these events, data shall be reported at any equal interval between 6 and 12 seconds. This interval shall always remain consistent for the dredge plant. | Between these events, report the data at an equal interval from 6 to 12 seconds. This interval must always remain consistent for the dredge plant. |
| 3.2.3 | A Simple Object Access Protocol (SOAP) web service shall be used to report sensor data to the DQM database. Data shall be transmitted as it is collected in real time and pushed to the DQM web service. If the web service is not available or returns an error message, the data shall be stored in a queue and transmitted upon re-establishment of the connection, starting with the oldest data in the queue and continuing until real-time transmission is restored. | Use a Simple Object Access Protocol (SOAP) web service to report sensor data to the DQM database. Transmit data as it is collected in real time and pushed to the DQM web service. If the web service is not available or returns an error message, store the data in a queue and transmit upon re-establishment of the connection, starting with the oldest data in the queue and continuing until real-time transmission is restored. |
| 3.2.4 | Each scow event shall be passed as a string on one continuous line of data. The example below is broken up by variable for ease of reading: | Pass each scow event as a string on one continuous line of data. The example below is broken up by variable for ease of reading: |
| 3.2.4 | DATE\_TIME values shall be formatted as YYYY-MM-DD HH:MM:SS, as shown above. If for any reason a field has no value, the enclosing XML tags should be sent with nothing between them (for example, <DRAFT\_AFT></DRAFT\_AFT>). | Format DATE\_TIME values as YYYY-MM-DD HH:MM:SS, as shown above. If, for any reason, a field has no value, the enclosing XML tags should be sent with nothing between them (for example, <DRAFT\_AFT></DRAFT\_AFT>). |
| 3.2.5 | The Contractor shall maintain an archive of all data sent to the DQM database during the dredging contract. The Permit Project Manager may require, at no increase in the contract price, that the Contractor provide a copy of these data covering specified time periods. The data shall be provided in the HTML format which would have been transmitted to the DQM database. Data submission shall be via storage medium acceptable to the Permit Project Manager.  | Maintain an archive of all data sent to the DQM database during the dredging contract. The Permit Project Manager may require, at no increase in the contract price, that the Contractor provide a copy of these data covering specified time periods. Provide the data in the HTML format which would have been transmitted to the DQM database. Submit data via storage medium acceptable to the Permit Project Manager.  |
| 3.2.5 | At the end of the dredging contact, the Contractor shall contact the DQM Support Center prior to discarding the data. The DQM Support Center will verify that all data has been received and appropriately archived before giving the Contractor discard permission. The Contractor shall then record in a separate section at the end of the scow’s onsite copy of the DPIP the following information: | At the end of the dredging contract, contact the DQM Support Center prior to discarding the data. The DQM Support Center will verify that all data has been received and appropriately archived before giving the Contractor discard permission. Record in a separate section at the end of the scow’s onsite copy of the DPIP the following information: |
| 3.3 | The Contractor’s DQM system shall be fully operational at the start of dredging operations and fully certified prior to moving dredge material on the contract (see Paragraph 1.4, “National Dredging Quality Management Program Certification”). To meet contract requirements for operability, in addition to certification, the Contractor’s system shall provide, at a minimum, a data string with values for all parameters while operating, as described within the specifications. Additionally, all hardware shall be compliant with DPIP requirements (Paragraph 1.5, “Dredge Plant Instrumentation Plan [DPIP]”). Quality data strings are considered to be those providing values for all parameters reported when operating according to the specification. Repairs necessary to restore data return compliance shall be made within 48 hours. Failure by the Contractor to report the required data within the specified time window for scow measurements (see Paragraph 3.2.2, “Data Reporting Frequency,” and Paragraph 3.2.3, “Data Transmission to the Web Service”) and failure to receive DQM certification prior to dredging will result in withholding of up to 10% of the contract progress payment per clause 52.232-5. | The Contractor’s DQM system must be fully operational at the start of dredging operations and fully certified prior to moving dredge material on the contract (see paragraph NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION). To meet contract requirements for operability, in addition to certification, the Contractor’s system must provide a data string with values for all parameters while operating, as described within the specifications. Additionally, all hardware must be compliant with DPIP requirements (see paragraph DREDGE PLANT INSTRUMENTATION PLAN [DPIP]). Quality data strings are considered to be those providing values for all parameters reported when operating according to the specification. Make repairs necessary to restore data return compliance within 48 hours. Failure by the Contractor to report the required data within the specified time window for scow measurements (see paragraph DATA REPORTING FREQUENCY and paragraph DATA TRANSMISSION TO THE WEB SERVICE) and failure to receive DQM certification prior to dredging will result in withholding of up to 10% of the contract progress payment per FAR clause 52.232-5.  |

| ***Sec. No.*** | ***Original Text*** | ***Revised Text*** |
| --- | --- | --- |
| ***Revisions made 05-12-2023*** |
| *1.4* | *The Contractor is required to have a current certification from DQM for the scow instrumentation system to be used under this contract. Criteria for certification shall be based on the most recent specification posted on the DQM website (*[*https://dqm.usace.army.mil/Specifications/Index.aspx*](https://dqm.usace.army.mil/Specifications/Index.aspx)*).* | *The Contractor is required to have a current certification from DQM for the scow instrumentation system to be used under this contract. Criteria for certification shall be based on the most recent specification posted on the DQM website (https://dqm.usace.army.mil).* |
| *1.4* | *Annual DQM certification shall be based on the following:** *A series of QA checks as outlined on the DQM website (*[*https://dqm.usace.army.mil/Certifications/Index.aspx*](https://dqm.usace.army.mil/Certifications/Index.aspx)*)*
 | *Annual DQM certification shall be based on the following:** *A series of QA checks as outlined on the DQM website (https://dqm.usace.army.mil).*
 |
| *1.5* | *A complete list of the required DPIP contents is provided on the DQM website (*[*https://dqm.usace.army.mil/Certifications/Index.aspx*](https://dqm.usace.army.mil/Certifications/Index.aspx)*).* | *A complete list of the required DPIP contents is provided on the DQM website (*[*https://dqm.usace.army.mil*](https://dqm.usace.army.mil)*).* |
| *3.1.6.2* | *3.1.6.2 Offloading**For non-dumping scows, an “OPEN” value shall indicate that the bin is in the process of being unloaded, either by pumping or mechanical means.* | *3.1.7 Offloading**Offloading occurs when the scow is being unloaded, either by hydraulic or mechanical means. When offloading is occurring, a value of “true” shall be reported; otherwise, a “false” value shall be reported. The only permissible values are “true” and “false”.* |
| *3.1.7* | *3.1.7 Course* | *3.1.8 Course* |
| *3.1.8* | *3.1.8 Speed* | *3.1.9 Speed* |
| *3.1.9* | *3.1.9 Heading* | *3.1.10 Heading* |
| *3.1.10* | *3.1.10 Draft* | *3.1.11 Draft* |
| *3.1.11* | *3.1.11 Displacement* | *3.1.12 Displacement* |
| *3.1.12* | *3.1.12 Bin Ullage Sounding* | *3.1.13 Bin Ullage Sounding* |
| *3.1.13* | *3.1.13 Bin Volume* | *3.1.14 Bin Volume* |
| *3.2* | *The Contractor’s DQM system shall be capable of collecting, displaying, and transmitting information to the DQM database. The parameters which shall be reported to the DQM database include trip number, date and time, hull status, scow course, scow speed, scow heading, draft, and displacement.* | *The Contractor’s DQM system shall be capable of collecting, displaying, and transmitting information to the DQM database. The parameters which shall be reported to the DQM database include trip number, date and time, hull status, offloading status, scow course, scow speed, scow heading, draft, and displacement.* |
| *3.2.1* | *The Contractor may select any commercial satellite, cellular phone, or other data communications systems available as long as it is capable of transmitting real-time data as well as enough additional bandwidth to clear historically queued data when a connection is reobtained. If connectivity is lost, unsent data shall be queued and transmitted upon restoration of connectivity. Delays in pushing real-time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM Support Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.*  | *The Contractor may select any commercial satellite, cellular phone, or other data communications systems available as long as it is capable of transmitting real-time data as well as enough additional bandwidth to clear historically queued data when a connection is reobtained. If connectivity is lost, unsent data shall be queued and transmitted upon restoration of connectivity. Delays in pushing real-time data to the DQM database shall not exceed four hours. Exceptions to these requirements may be granted by the DQM Support Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.*  |
| *3.2.2* | *Disposal activities shall be logged with high temporal and spatial resolution. Data shall be logged as a series of events. Each set of measurements (time, position, etc.) will be considered an event. Any required information in Paragraph 3.1, “Requirements for Reported Data,” that is not an averaged variable (that is, draft and ullage) shall be collected within 1 second of the reported time. Data shall be measured with sufficient frequency by the scow system to resolve the events to the accuracy specified in the following table. Any averaged variable must be collected and computed within this sampling interval. Event types “Sailing,” “Loading/Stationary,” “Offloading,” and “Open Water Disposal” are triggered by a time criterion; the criterion should be consistent across the “Sailing” and “Open Water Disposal” event types and should not change for the data collected on a given scow. This criterion should be documented by the Contractor in the DPIP.* ***Event Type****Loading/ Stationary****Event Trigger Descriptions****No change in position with hull status closed**An elapsed time of 1 hour since the last event.**No change in position with hull status open**-------------NONCLOSURE-------------**In the event a scow has completed an open-water disposal and transited back to a holding station without closing the hull, the sampling shall be changed to once per hour.****Event Time Resolution****1 minute****Event Position Resolution****N/A****Event Type****Sailing****Event Trigger Descriptions*** *Change in position with hull status closed**Time from the last sample equals 1 minute.****Event Time Resolution****1 second****Event Position Resolution****+/- 10 feet****Event Type****Open Water Disposal****Event Trigger Descriptions*** *Hull status open**A position must be recorded within 1 second of the hull status going from closed to open and again within 1 second of the hull status going from open to closed. The position shall be reported at any equal interval from 6 to 12 seconds. This interval shall always remain consistent for the dredge plant.****Event Time Resolution****1 second* ***Event Position Resolution****+/- 10 feet* ***Event Type****Offloading****Event Trigger Descriptions*** *Offloading material, hull status reported as open**A position must be recorded within 1 minute of arrival at the offload location and within 1 second of the material starting to be removed from the scow. The time from the last sample equals 1 minute.* *----------STANDBY OFFLOADING----------**In the event a scow is not being actively offloaded at the offload location for a time equal to 1 hour, the sampling interval shall be equal to once an hour.****Event Time Resolution****Offloading material, hull status reported as open**1 second**----------STANDBY OFFLOADING----------**1 minute**Example: The scow is stationary for 1 hour and 15 minutes, and then it sails to the disposal area. You should have a “Loading/Stationary” event at time 0, time 1 hour, and time 1 hour and 15 minutes. Then, for “Sailing,” within 1 second of an elapsed time of 1 minute from the 1 hour and 15 minutes event, another event occurs.****Event Position Resolution****+/- 10 feet* | *Disposal activities shall be logged with high temporal and spatial resolution. Data shall be logged as a series of events. Each set of measurements (time, position, etc.) will be considered an event. Any required information in Paragraph 3.1, “Requirements for Reported Data,” that is not an averaged variable (that is, draft and ullage) shall be collected within 1 second of the reported time. Data shall be measured with sufficient frequency by the scow system to resolve the events to the accuracy specified in the following table. Any averaged variable must be collected and computed within this sampling interval. Reporting intervals shall be consistent and should not change for the data collected on a given scow. This interval should be documented by the Contractor in the DPIP.* *Event Type**Loading/Sailing/Offloading/Idle* *Reporting Interval**1 minute****Time Resolution****1 second**Event Type**Open Water Disposal* *Reporting Interval**A data point must be recorded within 1 second of the hull status going from closed to open and again within 1 second of the hull status going from open to closed. Between these events, data shall be reported at an equal interval between 6 and 12 seconds. This interval shall always remain consistent for the dredge plant.**Time Resolution**1 second* |
| *3.2.4* | *<?xml version="1.0"?>**<SCOW\_DREDGING\_DATA version="2.5">* *<SCOW\_NAME>AU1994</SCOW\_NAME>* *<CONTRACT>W123BA-09-D-0087\_RL01</CONTRACT>* *<TRIP\_NUMBER>34</TRIP\_NUMBER>* *<X\_POSITION>-81.670632</X\_POSITION>* *<Y\_POSITION>41.528987</Y\_POSITION>* *<DATE\_TIME>2010-08-14 10:50:15</DATE\_TIME>* *<SCOW\_SPEED>0.0</SCOW\_SPEED>* *<SCOW\_COURSE>0.0</SCOW\_COURSE>* *<HULL\_STATUS>OPEN</HULL\_STATUS>* *<SCOW\_HEADING></SCOW\_HEADING>* *<SCOW\_FWD\_DRAFT></SCOW\_FWD\_DRAFT>* *<SCOW\_AFT\_DRAFT></SCOW\_AFT\_DRAFT>* *<SCOW\_AVG\_DRAFT></SCOW\_AVG\_DRAFT>* *<ULLAGE\_FWD></ULLAGE\_FWD>* *<ULLAGE\_AFT></ULLAGE\_AFT>* *<ULLAGE\_AVG></ULLAGE\_AVG>* *<SCOW\_BIN\_VOLUME></SCOW\_BIN\_VOLUME>* *<SCOW\_DISPLACEMENT></SCOW\_DISPLACEMENT>* *<SCOW\_LIGHTSHIP></SCOW\_LIGHTSHIP>* *<SCOW\_TDS></SCOW\_TDS>* *<ADDITIONAL\_DATA>Some more scow info, if needed</ADDITIONAL\_DATA>**</SCOW\_DREDGING\_DATA>* | *<?xml version="1.0"?>**<SCOW\_DREDGING\_DATA version="2.5">* *<SCOW\_NAME>AU1994</SCOW\_NAME>* *<PLANT\_IDENTIFIER>1999</PLANT\_IDENTIFIER>* *<CONTRACT>W123BA-09-D-0087\_RL01</CONTRACT>* *<TRIP\_NUMBER>34</TRIP\_NUMBER>* *<X\_POSITION>-81.670632</X\_POSITION>* *<Y\_POSITION>41.528987</Y\_POSITION>* *<DATE\_TIME>2010-08-14 10:50:15</DATE\_TIME>* *<SCOW\_SPEED>0.0</SCOW\_SPEED>* *<SCOW\_COURSE>0.0</SCOW\_COURSE>* *<HULL\_STATUS>OPEN</HULL\_STATUS>* *<OFFLOADING>FALSE</OFFLOADING>* *<SCOW\_HEADING></SCOW\_HEADING>* *<SCOW\_FWD\_DRAFT></SCOW\_FWD\_DRAFT>* *<SCOW\_AFT\_DRAFT></SCOW\_AFT\_DRAFT>* *<SCOW\_AVG\_DRAFT></SCOW\_AVG\_DRAFT>* *<ULLAGE\_FWD></ULLAGE\_FWD>* *<ULLAGE\_AFT></ULLAGE\_AFT>* *<ULLAGE\_AVG></ULLAGE\_AVG>* *<SCOW\_BIN\_VOLUME></SCOW\_BIN\_VOLUME>* *<SCOW\_DISPLACEMENT></SCOW\_DISPLACEMENT>* *<ADDITIONAL\_DATA>Some more scow info, if needed</ADDITIONAL\_DATA>**</SCOW\_DREDGING\_DATA>* |
| ***3.4*** | *DPIP*[*https://dqm.usace.army.mil/Certifications/Index.aspx*](https://dqm.usace.army.mil/Certifications/Index.aspx) | *DPIP*[*https://dqm.usace.army.mil*](https://dqm.usace.army.mil) |

| ***Sec. No.*** | ***Original Text*** | ***Revised Text*** |
| --- | --- | --- |
| ***Revisions made 10-20-2020*** |
| *3.2.3* | *The data transmission method call takes two arguments: a string containing the plant identifier assigned by the DQM Support Center and a second string containing the JSON-formatted sensor data.* | *The data transmission method call takes two arguments: a string containing the plant identifier assigned by the DQM Support Center and a second string containing the XML-formatted sensor data.* |

| ***Sec. No.*** | ***Original Text*** | ***Revised Text*** |
| --- | --- | --- |
| ***Revisions made 03-11-2020*** |
| *1.2* | *Dredge Plant Instrumentation Plan Revisions or Addendum, CESAM-OP-J* | *[Deleted]* |

| ***Sec. No.*** | ***Original Text*** | ***Revised Text*** |
| --- | --- | --- |
| ***Revisions made 08-30-2019*** |
| *Guid-ance* | *Tracking Profile**The Tracking Profile defines minimum requirements for data collection and submission. It requires GPS positioning and an indication of when the scow is being unloaded. It can be chosen if all that is of interest is an overview of where the scow travels and where the material is disposed.* | *[Deleted]* |
| *Guid-ance* | *Monitoring Profile**Building on the Tracking Profile, the Monitoring Profile includes scow position and status but adds draft sensors and displacement tables to give a relative indication of when most of the material has left the scow (or the length of time the material takes to dump) and the scow heading. Increases in draft can show digging locations and changes in loading can show leakage in gross relative terms.* | *Monitoring Profile**The Monitoring Profile includes scow position, heading, hull status, draft sensors, and displacement tables to give a relative indication of when most of the material has left the scow (or the length of time the material takes to dump). Increases in draft can show digging locations and changes in loading can show leakage in gross relative terms.* |
| *Guid-ance* | *TDS (Tons Dry Solids) Profile**The TDS Profile includes all the instrumentation and data from the other profiles with the addition of a calculation of the amount of material moved. This profile should be chosen when the amount of material needs to be critically monitored and you want to use TDS as a cross check for the volume of material moved. With this profile, the Ullage and Displacement tables will be verified by a water test prior to dredging operations to ensure they are within the acceptable standards of accuracy. The material being dredged should be homogeneous throughout the dredged area for best results. Contact the DQM Support Center at (251) 690‑3011 if you are considering requiring this profile as it is not applicable for all situations/conditions.* | *[Deleted]* |
| *Guid-ance* | *--* | *Specification Revisions**This section tracks all additions, deletions, and other revisions made to this document.**[Revisions list]* |
| *1.1* | *The work under this contract requires use of the National Dredging Quality Management Program (DQM) to monitor the scow’s status at all times during the contract and to manage data history.* | *The work under this contract requires use of the National Dredging Quality Management Program (DQM) to monitor the scow’s status at all times during the contract and to manage data history. For the purpose of these specifications, a scow is defined as any non-self-propelled vessel used to transport dredged material. This includes, but is not limited to, split-hull scows, pocket scows, hopper barges, and deck barges.* |
| *1.2* | *• Data Appropriately Archived email, Paragraph 3.2.5 (“Contractor Data Backup”)* | *[Deleted]* |
| *1.4* | *The Contractor is required to have a current certification from DQM for the scow instrumentation system to be used under this contract. Criteria for certification shall be based on the most recent specification posted on the DQM website (https://dqm.usace.army.mil/Specifications/Index.aspx). Compliance with these criteria shall be verified by onsite quality assurance (QA) checks conducted by the DQM Support Center Data Acquisition and Analysis Team and by periodic review of the transmitted data. If a system is installed specifically for this contract, the QA checks should take place either prior to any material being loaded into the scow to ensure that it is capable of transmitting quality data to the DQM database or, with prior approval of the local USACE District, during the first load for each scow and subsequent loads as is necessary to verify compliance. DQM Certification is valid for one year from the date of certification and is contingent upon the system’s ability to meet the performance requirements as outlined in Paragraph 3.3, “Performance Requirements,” and Paragraph 3.5, “Contractor Quality Control.” If issues with data quality are not corrected within 48 hours, the system certification shall be revoked and additional QA checks by the DQM Data Acquisition and Analysis Team may be necessary.* | *The Contractor is required to have a current certification from DQM for the scow instrumentation system to be used under this contract. Criteria for certification shall be based on the most recent specification posted on the DQM website (https://dqm.usace.army.mil/Specifications/Index.aspx). Compliance with these criteria shall be verified by onsite quality assurance (QA) checks conducted by the DQM Support Center Data Acquisition and Analysis Team and by periodic review of the transmitted data. If a system is installed specifically for this contract, in order to ensure that it is capable of transmitting quality data to the DQM database, the QA checks should take place either prior to the start of the contract or, with prior approval of the local USACE District, as soon as practical after dredging commences. DQM Certification is valid for one year from the date of certification and is contingent upon the system’s ability to meet the performance requirements as outlined in Paragraph 3.3, “Performance Requirements.” If issues with data quality are not corrected within 48 hours, the system certification shall be revoked and additional QA checks by the DQM Data Acquisition and Analysis Team may be necessary.* |
| *1.4* | *A series of QA checks as described in Paragraph 3.4, “Compliance Quality Assurance Checks”* | *A series of QA checks as outlined on the DQM website (https://dqm.usace.army.mil/Certifications/Index.aspx)* |
| *1.5* | *The DPIP shall include the following at a minimum.**(The DPIP must have a Table of Contents in the following order.)*1. *1. Dredging Company**a. Scow Point of Contact**b. Telephone Number**c. Email Address**2. 2. Scow Monitoring System Provider**a. Scow Monitoring System Point of Contact**b. Telephone Number**c. Email Address**3. 3. Scow Name/ID* *4. 4. Sensor Repair, Replacement, Installation, Modification, or Calibration Methods**5. 5. Data-reporting Equipment* *6. 6. Procedure for Providing Sensor - Data/Computed Data to the DQM Database via Email**7. 7. System Power Supply**8. 8. System Battery Charge Method**9. 9. Documentation on how the Contract Number will be Changed if the System is Left on Past the End of the Contract* *10. 10. System Telemetry**11. 11. Dimensioned Drawings of the Scow**a. Typical Plan and Profile View of the Scow Showing the Following:**i. i. Bin Cross Sections**ii. ii. Locations of the Required Sensors Referenced to the Following:* *(1) (1) Fore and Aft Perpendicular* *(2) (2) Bin Length, Depth, Width, Zero Reference**(3) (3) External Hull Draft Markings (Latitudinal, Longitudinal, Keel)**(4) (4) Each Other**iii. iii. Overall Scow Dimensions* *12. 12. Criteria and Method Used to Increment the Trip Number**13. 13. Description of how the UTC Time Stamp is Collected* *14. 14. Positioning System**a. Brand Name and Specifications* *b. Sampling Rates for Data Acquisition (Standard vs. Disposal)* *c. Instrument Used to Calculate the COG**d. Any Calculation Done External to the Instrumentation* *e. Certificates of Calibration and/or Manufacturer Certificates of Compliance**f. Description of how Scow Speed is Determined**15. 15. Hull Status**a. Instrumentation Brand Name and Specifications* *b. Certificates of Calibration and/or Manufacturer Certificates of Compliance* *c. Any Calculation Done External to the Instrumentation* *d. Criteria Used to Determine Hull Open/Closed**16. 16. Heading**a. Instrumentation Brand Name and Specifications* *b. Certificates of Calibration and/or Manufacturer Certificates of Compliance* *c. Any Calculation Done External to the Instrumentation* *d. Criteria Used to Determine Heading**17. 17. Drafts**a. Instrumentation Brand Name and Specifications* *b. Certificates of Calibration and/or Manufacturer Certificates of Compliance* *c. Any Calculation Done External to the Instrumentation* *d. Criteria Used to Determine Draft**18. 18. Displacement**a. a. Method Used to Calculate Displacement Based on Fore and Aft Draft**b. b. Tables Listing (Fresh and Salt Water) Displacement as a Function of Draft Provided by a Licensed Marine Surveyor/Naval Architect Independent of the Contractor.* *- - The scaling between each interval in the table is determined by the designer of the table (which is determined by the shape of the scow); however, units shall be reported, at a minimum, in feet and tenths of a foot for draft and long tons for displacement**- - These methods and tables must be an accurate reflection of the current configuration and displacement* *19. 19. Contractor Data* *a. Backup Frequency* *b. Backup Method**c. Post Processing**20. 20. Archive Capability* *21. 21. Documentation of Verification that the Reported Values are Applicable for the Sensor and Application* *22. 22. Quality Control Plan as per Paragraph 3.5, “Contractor Quality Control”**a. Name of the Quality Control Systems Manager**b. Procedures for Checking Collected Data Against Known Values**c. Procedures for Verifying that Telemetry is Functioning**23. Log of Sensor Performance and* *Modifications**24. Log of Contractor Data Backup as per* *Paragraph 3.2.5, “Contractor Data Backup”* | *A complete list of the required DPIP contents is provided on the DQM website (https://dqm.usace.army.mil/Certifications/Index.aspx).* |
| *3.1.3* | *Trip Number**A DQM trip number shall document the end of a disposal event for a given scow.* | *Load Number**A DQM load number shall document the end of a disposal event for a given scow.* |
| *3.1.3.1* | *Open-Water Disposal**The trip number will be incremented at the completion of each disposal/removal of material from the scow. Each scow shall maintain a separate trip-numbering sequence—that is, each scow will start with a trip number of 1; this number will be incremented by 1 each time the scow completes a disposal. The trip number must be calculated and repeatable based on a given logic; it may not necessarily correspond to the trip number logged aboard the dredge or tug. Efforts shall be made to include logic that avoids false trip number increments while also not allowing the routine to miss any disposal events.* | *[Deleted]* |
| *3.1.3.2* | *Offloading**The trip number will be incremented at the completion of each disposal/removal of material from the scow. Each scow shall maintain a separate trip-numbering sequence—that is, each scow will start with a trip number of 1; this number will be incremented by 1 each time that scow completes a disposal. The trip number must be calculated and repeatable based on a given logic; it may not necessarily correspond to the trip number logged aboard the dredge or tug. Efforts shall be made to include logic that avoids false trip number increments while also not allowing the routine to miss any disposal events.* | *[Deleted]* |
| *3.2.1* | *The Contractor may select any commercial satellite, cellular phone, or other data communications systems available as long as it is capable of transmitting real-time data as well as enough additional bandwidth to clear historically queued data when a connection is reobtained. If connectivity is lost, unsent data shall be queued and transmitted upon restoration of connectivity.* | *The Contractor may select any commercial satellite, cellular phone, or other data communications systems available as long as it is capable of transmitting real-time data as well as enough additional bandwidth to clear historically queued data when a connection is reobtained. If connectivity is lost, unsent data shall be queued and transmitted upon restoration of connectivity. Delays in pushing real-time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM Support Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.* |
| *3.2.3* | *Delays in pushing real-time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM Support Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.* | *[Moved to 3.2.3]* |
| *3.2.5* | *At the end of the dredging contract, the Contractor shall contact the DQM Support Center prior to discarding the data to ensure that it has been appropriately archived. The Contractor shall record in a separate section at the end of the scow’s onsite copy of the DPIP the following information:* | *At the end of the dredging contract, the Contractor shall contact the DQM Support Center prior to discarding the data. The DQM Support Center will verify that all data has been received and appropriate archived before giving the Contractor discard permission. The Contractor shall then record in a separate section at the end of the scow’s onsite copy of the DPIP the following information:* |
| *3.2.5* | *The same day of the phone call and prior to discarding the data, the Contractor shall submit a “Data Appropriately Archived” email to the local USACE District’s COR with the above information and cc: the DQM Support Center representative providing permission. In addition to the above information, the following shall also be included in the email:* *• Project name and contract number**• Scow start and end dates**• Name of the scow* | *[Deleted]* |
| *3.3* | *Failure by the Contractor to report the required data within the specified time window for scow measurements (see Paragraph 3.2.2, “Data Reporting Frequency,” and Paragraph 3.2.3, “Data Transmission to the Web Service”) and failure to receive DQM certification prior to dredging may result in withholding of up to 10% of the contract progress payment per clause 52.232-5.* | *Failure by the Contractor to report the required data within the specified time window for scow measurements (see Paragraph 3.2.2, “Data Reporting Frequency,” and Paragraph 3.2.3, “Data Transmission to the Web Service”) and failure to receive DQM certification prior to dredging will result in withholding of up to 10% of the contract progress payment per clause 52.232-5.* |
| *3.4* | *COMPLIANCE QUALITY ASSURANCE CHECKS* *Quality assurance checks are required prior to the commencement of dredging, and at the discretion of a Permit Project Manager periodically throughout the duration of the contract. As part of the testing requirements, the Dredging Contractor shall provide the above personnel an easily accessible visual display of measurements from the scow monitoring system in the same units that are submitted to the DQM database. These measurements shall be provided in real time on the scow or near real time on location. The Dredging Contractor shall also submit data collected during the QA checks from the scow monitoring system to the DQM database at completion of the checks. Detailed instructions for performing these checks and a spreadsheet for recording the results are available on the DQM website (https://dqm.usace.army.mil/Certifications/Index.aspx). Incoming data shall be periodically reviewed to ensure compliance with performance requirements outlined in Paragraph 3.3, “Performance Requirements.”* *For annual instrumentation checks and compliance monitoring, the DQM Data Acquisition and Analysis Team personnel attempt to be as flexible as possible in performing their checks so as not to delay work; however, in order to expedite matters as much as possible, it is necessary that they receive the support and cooperation of the local USACE District and Dredging Contractor. The Dredging Contractor shall coordinate pickup times and locations and provide transportation to and from any platform with a DQM certified system in a timely manner. Calibrations to the sensors should already have been performed before DQM personnel arrive on site.* | *[Deleted]* |
| *3.4.1* | *Position Check* *During the QA checks, both the static position of the scow and a dynamic tracking of movement though each of the event triggers (Paragraph 3.2.2, “Data Reporting Frequency”) will be monitored by an independent GPS unit. The DQM Data Acquisition and Analysis Team GPS data shall be compared to the data that is collected by the DQM-certified system for the same period. The data should be provided to the Data Acquisition and Analysis Team by the system provider while on site. The Data Acquisition and Analysis Team will confirm the position of the scow, verify that data collection intervals change as each of the scow event triggers change, and check all data reporting requirements. A Contractor-furnished tug will be required to transport the scow during this check. Throughout the contract, the Permit Project Manager will periodically verify reported positions by independently measuring with other equipment to verify locations.* | *[Deleted]* |
| *3.4.2* | *Hull Status Check**The Permit Project Manager will document the angle at which the hull status sensor registers “OPEN” and “CLOSED.”* | *[Deleted]* |
| *3.4.3* | *Draft and Displacement Check* *The Permit Project Manager shall periodically verify the accuracy of the fore and aft system reported draft values by comparing the vessel hull draft marks to the corresponding sensor readings indicated on the DQM screen. The vessel’s hull draft reading shall be viewed from a Contractor-supplied auxiliary vessel circling the dredge. The Permit Project Manager shall review the difference between averaged drafts recorded by the instruments and those estimated from the draft marks to ensure that the system is operating within the acceptable accuracy of approximately + 0.1 foot in calm seas conditions. Reported draft values will be verified light, loaded, and at other intervals at the discretion of the Permit Project Manager. If sensors responsible for collecting draft values are not located on centerline, verification may be required under different trim and list conditions. If values are outside the acceptable range, the Contractor shall recalibrate or repair system components as necessary. This check may be performed separately or as a part of the Water Load Test. For each system provided fore and aft draft, an average draft value will be calculated during the draft check, and the corresponding displacement will be verified longhand using the supplied draft/displacement tables.* | *[Deleted]* |
| *3.4.4* | *Bin Ullage Sounding and Volume Check* *The Permit Project Manager shall periodically check the reported bin ullage sounding using a tape measure or other distance measuring device. The Contractor shall furnish a clearly readable weighted tape, marked in tenths of a foot, capable of measuring throughout the full range of bin depth. The weight for this tape shall be a 6-inch diameter disk weighing between 2 and 3 pounds. The Permit Project Manager shall review the bin ullage sounding data to ensure that the system is operating within acceptable accuracy (0.1 foot). Reported ullage soundings will be verified light, loaded, and at other intervals at the Permit Project Manager’s discretion. Measurements can be taken from multiple locations along the combing or from the sensor location at the Permit Project Manager’s discretion. If values are outside the acceptable range, the Contractor shall recalibrate or repair system components as necessary. This check may be performed separately or as a part of the Water Load Test. For each system-provided fore and aft ullage sounding value, an average ullage sounding value will be calculated during the ullage check, and the corresponding bin volume will be verified longhand using the supplied bin volume tables.* | *[Deleted]* |
| *3.5* | *CONTRACTOR QUALITY CONTROL**The Dredging Contractor shall designate a Quality Control Systems Manager (QCSM), who shall develop and maintain daily procedures to ensure the Contractor’s quality control (CQC) of the DQM system. These methods shall include a procedure by which data being collected is checked against known values and telemetry is verified to be functioning.* *The Contractor Quality Control Plan, which describes these methods and procedures, shall be included in the DPIP as per Paragraph 1.5, “Dredge Plant Instrumentation Plan (DPIP).” This is the only section which shall be submitted to the local USACE District and is a required submittal prior to the start of the contract. CQC Reports may be required at the discretion of the Quality Assurance Representative (QAR) daily. Annotations shall be made in the CQC Report documenting all actions taken on each day of work, including all deficiencies found and corrective actions taken.* | *[Deleted]* |
| *3.6* | *LIST OF ITEMS TO BE PROVIDED BY THE CONTRACTOR* * *DPIP: Paragraph 1.5, “Dredge Plant Instrumentation Plan (DPIP)”*
* *DQM SYSTEM*
* *Sensor instrumentation: Paragraph 3.1, “Specifications for Reported Data”*
* *SCOW DATA*
* *Event documentation: Paragraph 3.2.2, “Data Reporting Frequency”*
* *Data reports*

*- Paragraph 3.2.3, “Data Transmission to the Web”* * *QA EQUIPMENT ON THE DREDGE*
* *Clear and accurate draft marks*
* *Ullage tape: Paragraph 3.4.4, “Bin Ullage Sounding and Volume Check”*
 | *LIST OF ITEMS TO BE PROVIDED BY THE CONTRACTOR* * *DPIP: https://dqm.usace.army.mil/Certifications/Index.aspx*
* *DQM SYSTEM*
* *Sensor instrumentation: Paragraph 3.1, “Specifications for Reported Data”*
* *SCOW DATA*
* *Event documentation: Paragraph 3.2.2, “Data Reporting Frequency”*
* *Data reports*

*- Paragraph 3.2.3, “Data Transmission to the Web”* * *QA EQUIPMENT ON THE DREDGE*
* *Clear and accurate draft marks*
* *Ullage tape*
 |

***\*THIS GUIDANCE SHOULD NOT BE INCLUDED IN THE CONTRACT\****



SECTION 35 20 23.13

NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM

SCOW - ULLAGE PROFILE

08-04-2023

PART 1 GENERAL

1.1 DESCRIPTION

The work under this contract requires use of the National Dredging Quality Management Program (DQM) to monitor the scow’s status at all times during the contract and manage data history. For the purpose of these specifications, a scow is defined as any non-self-propelled vessel used to transport dredged material. This includes, but is not limited to, split-hull scows, pocket scows, hopper barges, and deck barges.

This performance-based specification section identifies the minimum required output and the precision and instrumentation requirements. The requirements may be satisfied using equipment and technical procedures selected by the Contractor.

1.2 SUBMITTALS

• National Dredging Quality Management Program Certification

1.3 PAYMENT

Not used.

1.4 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM

CERTIFICATION

1.4.1 Certification

The Contractor is required to have a current certification from DQM for the scow instrumentation system to be used under this contract. Criteria for certification is based on the most recent specification posted on the DQM website (<https://dqm.usace.army.mil>). Verify compliance with these criteria by onsite quality assurance (QA) checks conducted by the DQM Support Center Data Acquisition and Analysis Team and by periodic review of the transmitted data. If a system is installed specifically for this contract, in order to ensure that it is capable of transmitting quality data to the DQM database, the QA checks should take place either prior to the start of the contract or, with prior approval of the local USACE District, as soon as practical after dredging commences. DQM Certification is valid for one year from the date of certification and is contingent upon the system’s ability to meet the performance requirements as outlined in paragraph PERFORMANCE REQUIREMENTS. If issues with data quality are not corrected within 48 hours, the system certification will be revoked and additional QA checks by the Data Acquisition and Analysis Team may be necessary.

Annual DQM Certification must be based on the following:

• A series of QA checks as outlined on the DQM website (<https://dqm.usace.army.mil>)

• Verification of data acquisition and transfer as described in paragraph PERFORMANCE REQUIREMENTS

• Review of the Dredge Plant Instrumentation Plan (DPIP) as described in Paragraph DREDGE PLANT INSTRUMENTATION PLAN (DPIP)

1.4.2 Quality Assurance (QA)

The Dredging Contractor must have personnel who are familiar with the system instrumentation and who have the ability to recalibrate the sensors on site during the QA process. The Dredging Contractor must coordinate pickup times and locations and provide transportation to and from any platform with a DQM system to team personnel in a timely manner. The Dredging Contractor must also have on site for the QA checks a tug capable of towing the scow. As a general rule, DQM Data Acquisition and Analysis Team personnel will come with personal protective equipment (PPE) consisting of hardhats, steel toe boots, and life jackets. If additional safety equipment is needed—such as eye protection, safety harnesses, work gloves, or personal location beacons—provide these items to the team while on site. Submit a test data package to the DQM database from the system on each scow and have it accepted by the DQM Support Center prior to scow compliance checks. Also submit data collected during the QA checks from the scow monitoring system to the DQM database and the DQM Data Acquisition and Analysis Team personnel while on site. It is the Dredging Contractor’s obligation to inform the QA team if the location designated for the QA checks has any site-specific safety concerns prior to their arrival on site.

The owner or operator of the scow must contact DQM at
DQM-AnnualQA@rpsgroup.com on an annual basis, or at least three weeks prior to the proposed beginning of dredging, to schedule QA checks. This notification is meant to make the Data Acquisition and Analysis Team aware of a target date and the permit on which the plant will be used. At least one week prior to the target date, the Dredging Contractor must contact the Data Acquisition and Analysis Team and verbally coordinate a specific date and location. The Contractor must then follow up this conversation with a written email confirmation. The owner/operator must coordinate the QA checks with all local authorities including, but not limited to, the local USACE permitting officer.

1.4.3 Recertification

Recertification is required for any yard work which produces modification to displacement (for example, a change in scow lines, or repositioning or repainting hull marks), modification to bin volume (change in bin dimensions, or addition or subtraction of structure), or changes in sensor type or location; report these changes in the sensor log section of the DPIP. A system does not have to be transmitting data between jobs; however, in order to retain certification during this period, the system sensors or hardware should not be disconnected or removed from the scow. If the system is powered down, retain calibration coefficients.

1.5 DREDGE PLANT INSTRUMENTATION PLAN (DPIP)

The Contractor must have a digital copy of the DPIP on file with the DQM Support Center. While working on site, the Contractor must also maintain on the dredge a copy of the DPIP which is easily accessible to Government personnel at all times. This document must describe the sensors used, configuration of the system, how sensor data will be collected, how quality control on the data will be performed, and how sensors/data reporting equipment will be calibrated and repaired if they fail. A description of computed scow-specific data and how the sensor data will be transmitted to the DQM database must also be included. A complete list of the required DPIP contents is provided on the DQM website (<https://dqm.usace.army.mil>).

Submit to the DQM Support Center any addendum or modifications made to the plan, subsequent to its original submission, prior to the start of work. Any changes to the computation methods must be approved by the DQM Support Center prior to their implementation.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 REQUIREMENTS FOR REPORTED DATA

Provide, operate, and maintain all hardware and software to meet these specifications. The Contractor is responsible for replacement, repair, and calibration of sensors and other necessary data acquisition equipment needed to supply the required data.

Complete repairs within 48 hours of any sensor failure. Notify the Permit Project Manager upon completion of a repair, replacement, installation, modification, or calibration. The Permit Project Manager may request recalibration of sensors or other hardware components at any time during the contract as deemed necessary.

Keep a log of sensor repair, replacement, installation, modification and calibration in the onsite copy of the DPIP. The log must contain a three-year history of sensor maintenance, including the time of sensor failures (and subsequent repairs), the time and results of sensor calibrations, the time of sensor replacements, and the time that backup sensor systems were initiated to provide the required data. It must also contain the name of the person responsible for the sensor work.

Install sensors that are capable of collecting parameters within specified accuracies and resolutions indicated in the following subparagraphs.

With the exception of position and any value calculated, reported sensor values should represent a weighted average with the highest and lowest values not included in the calculated average for the given interval. The averaging routine used should be consistent across all event triggers. This information should be documented in the DPIP sections that say “Calculations done external to the instrumentation.”

These data-reporting requirements cover the collection of electronic data on a scow through the entire dredging cycle. Disposal events can consist of both open-water disposal and offloading. Open-water disposal is the placement of material via bottom doors or split hull. Offloading is the placement of material via either hydraulic or mechanical means.

3.1.1 Scow Name

Assign each scow a unique name that will remain constant from one dredging operation to the next.

3.1.2 Permit Number

The USACE-assigned permit number for the project will be reported.

3.1.3 Load Number

 A DQM load number must document the end of a disposal event for a given scow.

3.1.4 Horizontal Positioning

Record horizontal positioning as the geographic coordinates of the vessel as indicated by the location of the Global Positioning System (GPS) antenna. Obtain all locations using a positioning system operating with a minimum accuracy level of 1 to 3 meters horizontal Circular Error Probable (CEP). Report positions as Latitude/Longitude WGS 84 in decimal degrees. West Longitude and South Latitude values are reported as negative.

3.1.5 Date and Time

 Report the date and time to the nearest second and referenced to Universal Time Coordinated (UTC) based on a 24-hour format: *yyyy*-*mm*-*dd* *hh*:*mm*:*ss*.

3.1.6 Hull Status

Hull status is meant to reflect a condition when material could be removed or released from the scow.

*For this contract, hull status must register closed prior to leaving the disposal area.*

3.1.6.1 Open-Water Disposal

Indicate an open split hull or open bottom door of a scow by reporting an “OPEN” value. Indicate a closed split hull or closed bottom door of a scow by reporting a “CLOSED” value. An open status must be indicated as the bin starts to open, and a closed status must be indicated only once the bin is fully closed. For pocket scows, the open/closed status must correspond to the compartment which is first to open and last to close.

3.1.7 Offloading

Offloading occurs when the scow is being unloaded, either by hydraulic or mechanical means. When offloading is occurring, report a value of “true”; otherwise, report a “false” value. The only permissible values are “true” and “false”.

3.1.8 Course

Provide scow course-over-ground (COG) using industry-standard equipment. Provide scow course-over-ground (to the nearest whole degree) with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

3.1.9 Speed

Provide scow speed-over-ground in knots using industry standard equipment with a minimum accuracy of 1.0 knot and resolution to the nearest 0.1 knot.

3.1.10 Heading

Provide scow heading using industry-standard equipment. The scow heading must be accurate to within 5 degrees and reported to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

3.1.11 Draft

Report all draft measurements in feet, tenths, and hundredths with an accuracy of + 0.1 foot relative to observed physical draft readings. Report the measurements at a resolution of two decimal places (hundredths of a foot). The reported forward draft value must be equal to the sum of the visual forward port and starboard draft mark readings divided by two. The reported aft draft value must be equal to the sum of the visual aft port and starboard draft mark readings divided by two. Forward draft, aft draft, and average draft will be reported. Place sensors at an optimum location on the scow to be reflective of observed physical draft mark readings at any trim or list. Minimum accuracies are conditional to relatively calm water. The reported sensor value is an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged. When the average draft is calculated for the purpose of determining displacement, maintain significant digits for average draft such that if forward draft were 0.15 and aft draft were 0.1, then the average draft would be 0.125.

3.1.12 Displacement

Report scow displacement in long tons, based on the most accurate method available for the scow. The minimum standard of accuracy for displacement is interpolation from the displacement table, based on the average draft. For this contract the density of water used to calculate displacement is **\_\_\_\_\_\_\*** kg/cubic meter, and is used for an additional interpolation between the fresh and salt water tables.

\**The water density used is project-/location specific. Enter the appropriate water density in the blank:*

 *• Fresh Water—1000 kg/m3 (1 g/cm3)*

 *• Salt Water—1027-1030 kg/m3 (1.027-1.03 g/cm3)*

3.1.13 Bin Ullage Sounding

Report all ullage soundings in feet, tenths, and hundredths with an accuracy of + 0.1 foot with respect to the combing and be representative of the forward and aft extents of the hopper as close to the centerline as is possible. Report the measurements at a resolution of two decimal places (hundredths of a foot). If sensors must be offset from the centerline of the bin they should be offset to opposite sides of the vessel. Forward ullage, aft ullage, and average ullage soundings will be reported. The reported sensor value is an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged. When the average ullage is calculated for the purpose of determining the hopper volume, maintain significant digits for the average ullage such that if the forward ullage were 0.15 and the aft ullage were 0.1, then the average ullage would be 0.125. Special arrangements for pocket scows may be made in consultation with the DQM Support Center.

3.1.14 Bin Volume

Report scow bin volume in cubic yards based on the most accurate method available for the scow. The minimum standard of accuracy for bin volume is interpolation from the bin volume table based on the average ullage soundings.

3.2 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SYSTEM REQUIREMENTS

The Contractor’s DQM system must be capable of collecting, displaying, and transmitting information to the DQM database. The parameters which must be reported to the DQM database include trip number, date and time, hull status, offloading status, scow course, scow speed, scow heading, draft, displacement, ullage, and bin volume. Provide an easily accessible, permanent visual display on the scow to show in real time the parameters collected by the system in the same units as the data submitted to the DQM database. In the event a reported parameter is calculated based on multiple sensors, the sensor values as used in the equation must be able to be viewed in addition to the required parameter. If a hardware problem occurs, or if a part of the system is physically damaged, the Contractor is responsible for repairing it within 48 hours of determination of the condition.

3.2.1 Telemetry

 The Contractor may select any commercial satellite, cellular phone, or other data communications systems available as long as it is capable of transmitting real-time data as well as enough additional bandwidth to clear historically queued data when a connection is reobtained. If connectivity is lost, queue and transmit unsent data upon restoration of connectivity. Delays in pushing real-time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM Support Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.

The data transmission process from the scow to the DQM database must be automated. The data may be sent from the scow directly to the DQM database or to a shore-based system. Data transmitted to the DQM database should be raw data; use a repeatable automated software or programming routine to process any shoreside data. Include a description of this process in the DPIP.

3.2.2 Data Reporting Frequency

Log disposal activities with high temporal and spatial resolution. Log data as a series of events. Each set of measurements (time, position, etc.) will be considered an event. Collect any required information in paragraph REQUIREMENTS FOR REPORTED DATA that is not an averaged variable (that is, draft and ullage) within 1 second of the reported time. Measure data with sufficient frequency by the scow system to resolve the events to the accuracy specified in the following table. Any averaged variable must be collected and computed within this sampling interval. Reporting intervals must be consistent and not change for the data collected on a given scow. This interval should be documented by the Contractor in the DPIP.

|  |  |  |
| --- | --- | --- |
| **Event Type** | **Reporting Interval** | **Time Resolution** |
| Loading/Sailing/Offloading/Idle | 1 minute | 1 second |
| Open Water Disposal | A data point must be recorded within 1 second of the hull status going from closed to open and again within 1 second of the hull status going from open to closed. Between these events, report the data at an equal interval from 6 to 12 seconds. This interval must always remain consistent for the dredge plant. | 1 second |

3.2.3 Data Transmission to the Web Service

Use a Simple Object Access Protocol (SOAP) web service to report sensor data to the DQM database. Transmit data as it is collected in real time and pushed to the DQM web service. If the web service is not available or returns an error message, store the data in a queue and transmit upon re-establishment of the connection, starting with the oldest data in the queue and continuing until real-time transmission is restored. Delays in pushing real-time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM Support Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.

Contact dqm-support@usace.army.mil to obtain the web service URL and the appropriate key credentials and communication protocol.

The data transmission method call takes two arguments: a string containing the plant identifier assigned by the DQM Support Center and a second string containing the XML-formatted sensor data. The method returns the string “OK” if the data is received. If the data is not received, either the web service or the client application throws an error.

### 3.2.4 XML-Formatted Sensor Data String

Pass each scow event as a string on one continuous line of data. The example below is broken up by variable for ease of reading:

<?xml version="1.0"?>

<SCOW\_DREDGING\_DATA version="2.5">

 <SCOW\_NAME>AU1994</SCOW\_NAME>

<PLANT\_IDENTIFIER>1999</PLANT\_IDENTIFIER>

 <CONTRACT>W123BA-09-D-0087\_RL01</CONTRACT>

 <TRIP\_NUMBER>34</TRIP\_NUMBER>

 <X\_POSITION>-81.670632</X\_POSITION>

 <Y\_POSITION>41.528987</Y\_POSITION>

 <DATE\_TIME>2010-08-14 10:50:15</DATE\_TIME>

 <SCOW\_SPEED>0.0</SCOW\_SPEED>

 <SCOW\_COURSE>0.0</SCOW\_COURSE>

 <HULL\_STATUS>OPEN</HULL\_STATUS>

 <OFFLOADING>FALSE</OFFLOADING>

 <SCOW\_HEADING></SCOW\_HEADING>

 <SCOW\_FWD\_DRAFT></SCOW\_FWD\_DRAFT>

 <SCOW\_AFT\_DRAFT></SCOW\_AFT\_DRAFT>

 <SCOW\_AVG\_DRAFT></SCOW\_AVG\_DRAFT>

 <ULLAGE\_FWD></ULLAGE\_FWD>

 <ULLAGE\_AFT></ULLAGE\_AFT>

 <ULLAGE\_AVG></ULLAGE\_AVG>

 <SCOW\_BIN\_VOLUME></SCOW\_BIN\_VOLUME>

 <SCOW\_DISPLACEMENT></SCOW\_DISPLACEMENT>

 <ADDITIONAL\_DATA>Some more scow info, if needed</ADDITIONAL\_DATA>

</SCOW\_DREDGING\_DATA>

Format DATE\_TIME values as *YYYY*-*MM*-*DD* *HH*:*MM*:*SS*, as shown above. If, for any reason, a field has no value, the enclosing XML tags should be sent with nothing between them (for example, <DRAFT\_AFT></DRAFT\_AFT>). The web service cannot handle a “null” value or any other indicators of no value collected.

3.2.5 Contractor Data Backup

Maintain an archive of all data sent to the DQM database during the dredging contract. The Permit Project Manager may require, at no increase in the contract price, that the Contractor provide a copy of these data covering specified time periods. Provide the data in the HTML format which would have been transmitted to the DQM database. Submit data via storage medium acceptable to the Permit Project Manager.

At the end of the dredging contract, contact the DQM Support Center prior to discarding the data. The DQM Support Center will verify that all data has been received and appropriately archived before giving the Contractor discard permission. Record in a separate section at the end of the scow’s onsite copy of the DPIP the following information:

• Person who made the call

• Date of the call

• DQM representative who gave permission to discard

3.3 PERFORMANCE REQUIREMENTS

The Contractor’s DQM system must be fully operational at the start of dredging operations and fully certified prior to moving dredge material on the contract (see paragraph NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION). To meet contract requirements for operability, in addition to certification, the Contractor’s system must provide a data string with values for all parameters while operating, as described within the specifications. Additionally, all hardware must be compliant with DPIP requirements (see paragraph DREDGE PLANT INSTRUMENTATION PLAN [DPIP]). Quality data strings are considered to be those providing values for all parameters reported when operating according to the specification. Make repairs necessary to restore data return compliance within 48 hours. Failure by the Contractor to report the required data within the specified time window for scow measurements (see paragraph DATA REPORTING FREQUENCY and paragraph DATA TRANSMISSION TO THE WEB SERVICE) and failure to receive DQM certification prior to dredging will result in withholding of up to 10% of the contract progress payment per FAR clause 52.232-5.

3.4 LIST OF ITEMS TO BE PROVIDED BY THE CONTRACTOR

DPIP <https://dqm.usace.army.mil>

DQM SYSTEM

 Sensor instrumentation Paragraph REQUIREMENTS FOR REPORTED DATA

SCOW DATA

 Event documentation Paragraph DATA REPORTING FREQUENCY

 Data reports Paragraph DATA TRANSMISSION TO THE WEB

QA EQUIPMENT ON THE DREDGE

 Clear and accurate draft marks

 Ullage tape