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Environmental Programs Directorate

Standard Operating Procedure

For **GROUNDWATER-LEVEL DATA PROCESSING, REVIEW, AND VALIDATION**

APPROVAL SIGNATURES:

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1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the process forthe review and validation of groundwater level data obtained from pressure transducers at the Los Alamos National Laboratory (Laboratory) Waste and Environmental Service (WES) Division, and LANL Water Stewardship Project (LWSP). .

This procedure applies to all WES personnel, students, and contract personnel who work with groundwater level data obtained from pressure transducers.

2.0 BACKGROUND AND PRECAUTIONS

2.1 Background

To address the requirements of the NMED Compliance Order on Consent, groundwater levels in most monitoring wells are monitored using automated pressure transducers. Groundwater level data obtained from pressure transducers must be reviewed and validated prior to loading data into the Water Quality Database (WQDB) to assure the accuracy and competency of the data. This SOP addresses the review and validation of groundwater level data from the transducers

2.2 Precautions

None.

3.0 EQUIPMENT AND TOOLS

No equipment or tools are needed.

4.0 STEP BY STEP PROCESS DESCRIPTION

4.1 General Information for Data Processing, Review, and Validation

Field Team Member	1.	**Temperature-Corrected Water-Density Values** Use the correct density value of water during processing of the raw transducer data to reduce the amount of error introduced by the calculation process. Some transducer manufacturer software programs, such as recent versions of the Win-Situ and Data Manager programs by In-Situ, Inc., allow user input of water density values. Water density is dependent on the quantity of dissolved minerals or contaminants and temperature (In-Situ, Inc, 2000). The density of water containing relatively few dissolved minerals or contaminants, such as most groundwater at Los Alamos, is primarily dependent on temperature.

Field Team Member (continued)

2. Use the following table to select the appropriate water density values based on the average temperature of the water derived from the transducer measurements. Temperature of the water is typically measured by transducer equipment and is usually available during processing of the raw data files.

Density Values of Pure Water as Function of Temperature							
Temp (C)	Density (g/cc)		Temp (C)	Density (g/cc)		Temp (C)	Density (g/cc)
1	0.9999		11	0.9996		21	0.9980
2	0.9999		12	0.9995		22	0.9978
3	1.0000		13	0.9994		23	0.9975
4	1.0000		14	0.9992		24	0.9973
5	1.0000		15	0.9991		25	0.9970
6	0.9999		16	0.9989		26	0.9968
7	0.9999		17	0.9988		27	0.9965
8	0.9998		18	0.9986		28	0.9962
9	0.9998		19	0.9984		29	0.9959
10	0.9997		20	0.9982		30	0.9956
C = Celsius g/cc = grams/cubic centimeter							

Source: InSitu, Inc. 2000

4.2 Latitude and Elevation Correction Parameters for Water Density

Field Team Member

1. Input latitude and elevation values to correct for acceleration in the water-level calculation, using the following parameters as a guide.
   - The elevation of the groundwater is obtained from manual measurement (see SOP-5223, Manual Groundwater Level Measurements). Input the groundwater elevation to the nearest 10 feet as appropriate.
   - Approximate latitude of the Los Alamos area is 36 degrees north.
   - Document parameters used to calculate water-level data in the calculated data file.

4.3 Calculating Water Levels in Westbay Wells

Field Team Member

1. Select the fixed value option for atmospheric pressure in the WinGT software to adjust the absolute pressure measurements as a general guideline for calculating water levels in Westbay wells that utilize absolute pressure measurement transducers.

Field Team Member (continued)	2.	Use a fixed atmospheric pressure that exists at the approximate elevation of the surface of the saturated zone for which the water level calculation is being prepared. The P_i value of monitoring ports located near the top of an intermediate zone or at the top of the regional aquifer will typically measure the atmospheric pressure at the elevation nearest the top of the saturated zones. Use the average P_i value of a port if multiple measurements are available. **[CAUTION: Be certain that the port for the P_i measurement nearest the surface of the saturated zone is above the deionized water inside the Westbay casing. The top of the deionized water column inside the Westbay casing is typically located between the monitoring zone at the top of the regional aquifer and the next lower monitoring zone. Check the Westbay completion report and piezometric calculations of the deionized water level obtained from the P_i measurements from monitoring zones below the top of the regional aquifer.]**
	3.	If P_i values are not available for the surface of the saturated zone, it is possible to calculate atmospheric pressure at a specific elevation: For the standard atmosphere, variation of pressure with elevation is approximately linear in the elevation range 8,202–4,921 feet (ft), which correspond to 10.83 pounds per square inch (psi) and 12.26 psi, respectively, for a slope of 4.36×10^{-4} psi/ft. The correction for increased pressure is P_{atm} at saturated surface (psi) = P_{atm} at ground surface + [4.36×10^{-4} psi/ft $\times$ depth to water (ft)].
	4.	Use a fixed, rather than fluctuating, atmospheric pressure to prevent introduction of potential error in the resulting water-level data, because atmospheric pressure fluctuates daily and seasonally due to temperature changes in the atmosphere and passing weather fronts.
	5.	The type of atmospheric pressure needed to adjust absolute formation pressure data may be different for different wells and for different zones within a well, depending on the hydrologic properties of each zone in the well. It may be necessary to construct overlapping time-series plots of monitoring port pressure data and atmospheric pressure data measured at the well to determine, for example, if an immediate response to atmospheric pressure occurs at each monitoring port to determine how best to adjust for atmospheric pressure. In a shallow well with an unconfined aquifer, it may be appropriate to use the well's own atmospheric pressure measured at ground surface for the adjustment.
	6.	The resulting calculated water-level characteristics of each zone will depend on which atmospheric pressure corrections are used. Deeper zones of saturation, such as those in the Los Alamos area, typically do not exhibit immediate responses to atmospheric pressure changes, and therefore it is not appropriate to use the well's own atmospheric pressure to adjust the measured pressure.
	7.	Use the fixed average atmospheric pressure (P_i) measured at, or calculated for, the surface of each zone of saturation, if in doubt.

4.4 Raw Data File Handling

Field Team Member	1.	Handle raw electronic transducer data files according to requirements for data handling in the RRES-WQH-GWLM-QAPP, Quality Assurance Program Plan for the Groundwater Level Monitoring Program.

	2.	Retrieve raw data files from transducer equipment in accordance with SOP 5227, Pressure Transducer Installation, Removal, and Maintenance, and SOP 5226, Westbay Pressure Transducer Installation, Removal, and Maintenance, Transducer Data Retrieval sections.
Data Validator	3.	Ensure that the raw data files are transferred to the common (shared) Waste and Environmental Services (WES) server for permanent storage and archival.
	4.	Transfer raw Westbay data to WinGT software for calculation into water-level data according to this procedure.
	5.	Archive processed data files on the WES server.

4.5 Processing Transducer Data

The raw electronic transducer data files are processed to obtain meaningful groundwater-level data. The raw binary pressure data files are converted into useable data format using transducer manufacturer proprietary software. In-Situ, Inc., transducers and data loggers typically create a raw data file with a “bin” extension. Westbay data loggers create either “WD2” or “WDF” raw data files.

4.6 Processing Data from In-Situ, Inc., Data Files

Field Team Member	1.	Compare information in the data file with information recorded during installation or removal of the transducer by field personnel by performing the following steps.
	2.	Open the data file using WinSitu or DataManager software programs. The data file will have a .BIN filename extension.
	3.	Verify that the data file name represents data for the correct well. If necessary, change the data file name to reflect the well name.
	4.	Check that beginning and ending dates and times are in Mountain Standard Time (MST) and that the transducer serial number and other information in the data file header correspond with field records.
	5.	Enter the appropriate water density into the software using the table in section of this document titled Temperature Corrected Water Density Values.
Field Team Member (continued)	6.	Enter the approximate latitude (36 degrees north for Los Alamos area) and approximate elevation of the water into the software to provide appropriate corrections for water density (refer to the section of this document titled Latitude and Elevation Correction Parameters for Water Density). [NOTE: Transducer data may be displayed as pressure (psi), pressure head (ft), depth from surface (ft), or in elevation from mean sea level (msl) if the groundwater elevation is entered as the reference elevation.]

	7.	Determine that the reference water elevation in the data file corresponds with the manual water elevation obtained when the transducer was installed. [NOTE: If a manual water level was not obtained at the beginning of a data file, use the most recent water elevation calculated from an immediately preceding transducer dataset. This method can be used if the elapsed time between the end of the previous dataset and the beginning of the next transducer dataset is less than 2 hours and the water level change is less than 0.1 foot.]
	8.	Verify that the beginning pressure head recorded by the transducer corresponds with the pressure head recorded when the transducer was installed. Make corrections to initial reference settings as appropriate to create a valid dataset.
	9.	Calculate groundwater elevation using the appropriate parameters (refer to Steps 5 and 6 above) in the Data Manager software. Compensation for atmospheric pressure is not necessary for typical In-Situ, Inc., gage transducers used at the Los Alamos National Laboratory (LANL).
	10.	Transfer transducer water-level data to text file or spreadsheet format for further data review and validation.

4.7 Processing Data from Westbay Transducers

Field Team Member	1.	Compare information in the data file with information recorded during installation of the transducer on the MOSDAX Probe String Installation/Retrieval Field Form (SOP 5226, Attachment 3) by performing the following steps.
	2.	Open the data file using WinGT or MLOG (Convert Utility) software programs. Data file will have a .WD2 or .WDF file name extension.
	3.	Verify that the time zone value is set to –7.00 hours with respect to Coordinated Universal Time when prompted by the software.
	4.	Verify that beginning and ending dates and times, the transducer serial numbers, and other information in the data file header correspond with field data recorded on the Probe String Installation/Retrieval Field Record (SOP 5226, Attachment 3) or the field data recorded on the Westbay® Groundwater Sampling Field Data Sheet (SOP 5225, Groundwater Sampling using Westbay System, Attachment 4).
Field Team Member (continued)	5.	Verify that correct well zone information, port name, port depth, and probe numbers coincide with those for the appropriate well, as published in the well completion report.
	6.	Verify that the correct ground elevation of the well (brass cap elevation) has been entered into the data file header.
	7.	Review the P_i and P_o pressure data from the Westbay® Probe String Installation Data Form (SOP 5226, Attachment 3) or the Westbay Groundwater Sampling Field Data Sheet (SOP 5225, Attachment 4) for each port and check that measured pressure data is consistent with previous measurements.

	8.	Determine that each probe was properly attached to the appropriate port by checking that P_o values are similar to previous P_o values for each port.
	9.	If P_o values are not similar to previous measurements, determine if measured P_o values are consistent with the following: • Previous P_i values (if the probe did not properly connected to monitoring port), or • Atmospheric pressures at the elevation of the port (for monitoring ports above the level of the deionized water in the Westbay casing), or • Equivalent to surface atmospheric pressure (response for probes not installed in the well).
	10.	Review time series of the pressure data to check for possible sensor drift with time or cyclical, spiking or fading response that may indicate transducer or transducer power supply failure.
	11.	Import data file to WinGT data file (.WGT extension file) by either: • Importing the data file into an existing WinGT data file (.WGT extension file) that has previously been created for that well. [NOTE: Use this option only if assured that a WDF or WD2 data file is appropriate for a given well. This will save time in entering correct well information, port depths, zone intervals, etc., and allows the transducer data to be merged with pre-existing data for a specific well.] OR • Manually enter or import P_o and P_i data from groundwater sampling events (WDF or WD2 data file) into a WinGT data file (.WGT extension file) that has been created for that well.
Field Team Member (continued)	12.	Select the atmospheric pressure source to use to adjust the absolute formation pressure data. The WinGT software provides three choices for selecting atmospheric pressure data: • The well's own atmospheric pressure measurements obtained concomitantly with the monitoring port pressure data • Atmospheric pressure data from another nearby well • A fixed value for atmospheric pressure. [NOTE: As a general guideline for calculating water levels in Westbay wells that use absolute pressure measurement transducers, select the fixed value option for atmospheric pressure in the WinGT software to adjust the absolute pressure measurements. Refer to the section in this "Calculating Water Levels in Westbay Well," General Information for Data Processing, Review, and Validation section of this document.]

13. Calculate the piezometric water elevation for each monitoring port using the WinGT software.

    [NOTE: If header file contains 0.00 for the elevation of the well, the software will calculate depth to the piezometric level of the water, based on the depth of each monitoring port. If header file contains the appropriate ground elevation of the well in feet above mean sea level (ft amsl), the software will calculate piezometric water elevation in ft amsl for each monitoring port.]

14. Transfer piezometric groundwater elevation data to spreadsheet file format for further review and validation.

4.8 Transducer Data Review and Validation

Data Reviewer/ Validator

1. Groundwater level data shall be reviewed for completeness and appropriateness and validated on a routine basis as the data are collected for each well. A determination as to the acceptance or rejection of the data shall be provided by the designated data reviewer.

2. Assign data quality codes and data quality descriptions from the following table to identify valid and invalid data.

Data Quality Code	Data Quality Description	Comment
I	Invalid data	
IQ	Invalid data with some validity question	
V	Valid data	Null entry implies valid data
VQ	Data are considered valid with some validity question	
VR	Data are considered valid but with reduced measurement accuracy	Accuracy of measurement is less than optimal
VRVQ	Reduced measurement accuracy with validity question.	Combination of VR and VQ

Data Reviewer/ Validator (continued)

3. Assign data validation reason codes and reason descriptions from the following table to explain why the data have been determined to be VQ, VR, I, or IQ.

Reason Code	Reason Code Description	Comment
BT	Water level is below transducer, data are not valid	
C	Composite water level	Composite water level measured in multiple screen well
D	Port/zone is dry, pressure data not valid	
DI	Data values interpolated using manual measurement values	Transducer drift prompted interpolation of data
DN	Port/zone is nearly dry (e.g., with 0.5 ft of port)	Transducer data may be unreliable
E	Equipment malfunction	
KP	Transducer data calculated from known point location of transducer	
M	Motor arm/shoe report inconsistent	Westbay transducers
MA	Measurement tool or method Accuracy not optimal	Accuracy of the measurement not as good as possible
MMNA	Manual measurement not available	
NC	Nonconforming water-level data for zone	
P_i	Pressure data is P_i not P_o	Westbay transducers
RL	Manual measurement for reference level not documented or in question	Manual measurement not well documented
RW	Transducer removed from well, pressure data are not valid	Pressure data are atmospheric
WC	Well construction makes pressure data questionable	Well construction may not provide reliable pressure data
WS	Water-level measured in sump	Water in sump, not indicative of formation water level

4. Assign water level type codes from the table below to describe the type of water level data that are available for data review and validation, and for population in the Water Level Database.

Water Level Type Code	Water Level Type Code Description	Comment
DR	Water level derived from raw pressure data	
DI	Interpolated water level data	Data recovered from drifting transducer
DV	Single daily water level value	Daily value selected from multiple measurements
MD	Mean daily water level	Calculated mean daily value from multiple measurements

Data Reviewer/ Validator (continued)

5. Suggested steps for performing data review and validation of transducer groundwater-level data are provided in the following steps; however, data review and validation personnel must review and evaluate the data for each well on an individual basis, as not all potential problems with data can be addressed in a procedure.

6. Open the spreadsheet created in Processing Data from Westbay Transducers, Step 14.

7. Plot the time series of the groundwater elevation (hydrograph) and, if available, the time series of the atmospheric pressure data.

8. Document the following information on the Transducer Data Review and Validation Form (Attachment 1):

   Well name

   Reviewer name

   Date of data review

   Transducer manufacturer, serial number, and the pressure rating of the transducer

   File name of the raw data file and the calculated data file

   Start and end time of the transducer data

   Data collection rate in minutes

   Data review comments

   State if data are valid or invalid

   Reason for invalidating data–data quality code and validation reason code.

9. Review the hydrograph to determine if a correlation exists with atmospheric pressure data using the following criteria. Interpret the results to determine if groundwater-level data from absolute-measuring transducers require recalculation using a different selection for atmospheric pressure.

   - Single completion wells open to the atmosphere that use compensated transducers will typically show an inverse correlation between atmospheric pressure and water level inside the well.
   - For Westbay-equipped wells using absolute transducers, if the groundwater-level data were calculated using the well's real-time atmospheric pressure correction and the water level shows a direct inverse correlation to atmospheric pressure, the water level fluctuation may be an artifact of over-correcting a stable water level pressure response. Recalculate the groundwater level data using a fixed atmospheric pressure (refer to Step 4 in the data processing section).
   - Compare the revised hydrograph with atmospheric pressure to evaluate any aquifer response to atmospheric pressure.

4.9 Reviewing the Hydrograph for Single Completion Wells

Data Reviewer/ Validator

1. Determine if beginning and ending water levels correspond with manually measured water levels obtained before the transducer was installed and at time of retrieval of transducer data.

   - If beginning transducer water level is different from the manual water level obtained at the time of transducer installation, determine the source of the difference. Some normal water level change could have occurred between the time of the manual measurement and the beginning of transducer measurements, especially if transducer measurements began over several hours after the manual measurement.
   - Check that the correct reference elevation was used during transducer installation and for water-level calculations, revise and recalculate the groundwater-level data if necessary.

2. Check the beginning of transducer water-level data for signs of cable stretch or slippage. Identify suspect data.

   - If ending transducer water level does not coincide with the manual water level obtained at the end of the data series, check calculations to determine the source of the error.
   - If beginning transducer water level coincides with the manual water level obtained at the time of installation, but the ending transducer water level does not coincide with the manual water level obtained at the end of the data series, transducer sensor drift may have occurred, transducer battery voltage may have declined causing erroneous measurements, or the manual measurement may contain an error. Consider collecting another manual measurement or waiting for the subsequent download to compare hydrographs if deadlines for data submittal allow. Consider interpolation of the transducer data to correct transducer drift if appropriate.
   - If transducer water-level measurements do not coincide with the manual measurements, invalidate the transducer data, and have the transducer checked and calibrated according to SOP 5226 or SOP 5227.

4.10 Reviewing the Hydrograph for Multiple Completion Wells

Data Reviewer/ Validator	1.	Compare the hydrograph of newly obtained data with hydrographs of previous datasets, if available, and with water levels obtained during installation and retrieval of the transducers and/or with water levels obtained during groundwater sampling.
	2.	Plot all data on the hydrograph and review the data for inconsistencies or irregularities.
	3.	Note especially perched zones or water table zones that may be reported dry during sampling events. Continuous absolute pressure data from these zones may erroneously indicate a water-level fluctuating in response to atmospheric pressure. • If calculated water elevation is within 0.5 feet of the elevation of the monitoring port, check if sample events have reported the zone dry; reject erroneous data and report the zone dry if appropriate.
Data Reviewer/ Validator (continued)	4.	Check zones where P_i is similar to P_o. Ensure that the transducer was properly attached to the port and was recording appropriate data
	5.	Evaluate P_i data of zones below the deionized water level in the Westbay casing by calculating the water level and plotting the hydrograph of the P_i water level. Note and document any significant water-level changes and investigate unusual circumstances. • If water level changes occur, check field notes of transducer installation and retrieval and groundwater sampling events to determine the source of the water-level change.
	6.	Review and assess trends observed in water-level data on daily, seasonal, and yearly scales using the following guidance. Focus on unusual spikes or cyclical trends that may indicate equipment problems. • Rising water levels may cause over pressurization of the transducer; look for reduced sensitivity or flat data responses. • Falling or highly fluctuating water levels may drop below the level of the transducer or below the well screen or port; look for uncharacteristic water-level responses and check if the response is possibly the result of groundwater sampling event, nearby well pumping, etc. • Malfunctioning transducers may record normal-looking data that have no relation to the water level. Review water-level data for changes in character over time.
	7.	Reject water-level data determined to be erroneous, atypical, or nonconformable. Several years of data may need to be collected before a dataset can be properly evaluated using these parameters. Document all primary and subsequent reviews of data on the Transducer Data Review and Validation Form (Attachment 1).
	8.	Validate groundwater level data that meet the criteria of the review process.
	9.	Document the data review and validation process on the Groundwater Level Data Review and Validation Worksheet (Attachment 1).

4.11 Records Management

All	1.	Maintains and submits the following records and/or documents generated to the Records Processing Facility according to EP-DIR-SOP-4004, Records Transmittal and Retrieval Process: • Transducer Data Review and Validation Form (Attachment 1) • Raw data files • Calculated data files.

5.0 DEFINITIONS

Absolute pressure – The total or absolute pressure measured by a sensor without correction for atmospheric pressure. A pressure measurement that includes atmospheric pressure is an absolute pressure. Units are expressed in psia (pounds per square inch absolute).

Calculated data files – Groundwater level data files that result from calculation of the raw data files into groundwater elevation data using the proprietary software provided by the transducer manufacturer. Calculated data files can be comma separated value (csv) text files (or similarly separated values, such as tab or space separated), spreadsheet files, database files, etc.

Gage pressure – The pressure measured relative to atmospheric pressure. Measurements exclude atmospheric pressure and are said to be compensated or gaged for atmospheric pressure. A vented or gage pressure transducer sensor utilizes a vent tube in the cable that exposes one side of the pressure sensor to atmospheric pressure, measuring pressure of the water column only. Units are expressed in psig (pounds per square inch gage).

Ground elevation – The elevation of the ground surface of the well expressed in feet above mean sea level. If the well has a concrete surface pad, usually the elevation of the top of the concrete pad. If a brass cap is present to identify a well, usually the elevation of the brass cap in the concrete pad.

Pressure head – The height in feet of a column of water measured by a transducer at a point in a well.

Pressure transducer (transducer) – A device that measures pressure. There are two types of pressure transducers, those that measure absolute pressure, and those that measure gage pressure.

Piezometric elevation – (1) The elevation to which the water at a specific point in an aquifer will rise; (2) The water elevation calculated from pressure data.

P_i – Pressure measured inside the Westbay casing usually at a specific measurement port. P_i measured above the deionized water column in the Westbay casing is equal to atmospheric pressure at a given port elevation; calculated piezometric elevation will approximate the elevation of the port. P_i measured below the deionized water level inside the Westbay casing will be the pressure head of the deionized water column; calculated piezometric elevation will be that of the elevation of the top of the deionized water column.

P_o – Pressure measured of the formation outside the Westbay casing at a specific monitoring port. P_o of “dry” monitoring ports will approximate P_i at that port if the port is above the deionized water column. P_o of “wet” monitoring ports should not normally equal the P_i of the port. Calculated piezometric elevation represents the piezometric water level at the location of the monitoring port.

pounds per square inch (psi) – Unit of pressure measurement.

pounds per square inch absolute (psia) – Unit of pressure measurement, see absolute pressure.

pounds per square inch gage (psig) – Unit of pressure measurement, see gage pressure.

Raw data files – Electronic pressure transducer data files that are obtained from pressure transducers or data loggers at a well site. Raw data files are often binary computer files that can be opened, read, and interpreted only by software developed by the manufacturer of the transducer. The raw data files must be stored and archived appropriately in order to secure the original data from the pressure transducer. Raw data files contain the raw pressure measurements and date/time stamp from the transducer and may also contain information entered into the transducer software program at the time of installation, such as well name, date/time, measurement interval, reference water elevation at the time of installation, etc.

Reference level – The elevation of the surface of the water in a well at the time of installation of the transducer. Determined by manual measurement of the groundwater elevation according to SOP-5223.

Water elevation – The elevation of the surface of the water in a well, expressed in feet above mean sea level.

Water level – (1) Depth to water (DTW) in a well below ground elevation expressed in feet, or (2) the water elevation expressed in feet above mean sea level. Refer to SOP-5223 for information about measuring groundwater level in a well.

6.0 PROCESS FLOW CHART

Not applicable.

7.0 ATTACHMENTS

Attachment 1 Groundwater Level Data Review and Validation Form

8.0 REVISION HISTORY

Revision No. *(Enter current revision number, beginning with Rev.0)*	Effective Date *(DCC inserts effective date for revision)*	Description of Changes *(List specific changes made since the previous revision)*	Type of Change *(Technical [T] or Editorial [E])*
0	09/04	New document.	
1	12/05	Update text, revise Attachment 1	
0		New procedure, supersedes RRES-WQH-QP-062.1	All

Using a CRYPTOCard, click here to record "self-study" training to this procedure.

If you do not have a crypto card with A-level Access, contact creichelt@lanl.gov for instructions on receiving credit.

ATTACHMENT 1

SOP-5230-1

Records Use Only

TRANSDUCER DATA REVIEW AND VALIDATION FORM

Los Alamos National Laboratory
ADEP/LWSP
Transducer Data Review and Validation Form

Well Name: Data Reviewer:

	Transducer				Data Review						Data Validation	
Date of Review	Manu-facturer	Serial No.	Port	Sensor Range (psi)	Raw Data File Name	Calculated Data File Name	Date/Time Data Start	Date/Time Data End	Data Collection Rate (min)	Groundwater Level Data Review Comments	Data Valid? Y/N	Comment / Reason for Invalidation of Data

Example

SOP-5230-1