Groundwater level records.

Process of Analyzing, Approving and Auditing of Discrete Groundwater-Level Records

Analyzing Discrete Groundwater Level Records - After each field trip for discrete data-only sites and continuous record sites

This data processing stage is the responsibility of the person most familiar with the field visit and factors that may affect the data. This data processing stage should begin as soon as practical after the field visit, ideally within one week of returning to the office. The discrete water-level measurement should be entered into NWIS prior to beginning the analysis process. For routine discrete water-level sites, a station analysis must be written for the period of analysis using the established Station Analysis Template and stored in the Water Mission Area supported records management system (RMS). Synoptic network sites measured once annually or less often do not require a station analysis when there is an interpretive product documenting the evaluation of the water-level measurements.

- Document routine and non-routine field visit activities which might affect the data or its interpretation.
- Document results of visual/manual inspection of the measuring point (MP), land surface datum (LSD), and reference marks (RM). Note dates of any damage.
- If station levels were run or adjustments were made to the vertical relationship between the MP and any of the RMs, document corrections in the **Datum Corrections** section of the Station Analysis. Document in the Historic Levels Summary, station description, and NWIS (if necessary).
- Document well integrity testing performed during the site visit, if applicable. A description of the test and brief summary of results should be documented in the **Well Integrity** section of the SIMS Station Description.
- Archive site inspection XML file from MONKES/SVMobileAQ, the preferred software for data collection. If not using MONKES/SVMobileAQ, electronically scan field notes and archive appropriately.
- Review hydrograph comparing the new and historic measurements. Document trends in the **Water-Level Fluctuations/Trends** section of the Station Analysis. An initial review can be done in the field before leaving the site when using MONKES/SVMobileAQ.
- Document hydrographic comparison of nearby or similar sites, if applicable, in the **Hydrographic Comparison** section of the Station Analysis. For continuous-record sites, this step can occur during analysis of continuous data.
- Update the station analysis for the period in the RMS following the established Station Analysis Template. Be sure to provide any pertinent remarks or comments for the period of

analysis that are not contained in other sections in the **Comments** section of the Station Analysis.
- Update the SIMS Station Description with any relevant changes that have occurred at the site during the analysis period.

Approving Discrete Groundwater Level Records

This data processing stage must be done by someone other than the data collector/analyst. The record approver performs a quality-control check of the methods and procedures used to collect and process the record and verifies the accuracy and interpretations of the analyzed period.

- Review field visit notes and Station Analysis from the analyst. Notes from the site inspection should substantiate the record relative to site status, site conditions, and the site history.
- Check corrections applied to the data such as measuring point, time datum, and tape calibration corrections.
- The vertical relation between the MP and RMs should be confirmed at 3–5 year intervals for long-term sites. Document if this check is overdue.
- If station levels were run, verify documentation in the Historic Levels Summary and Station Description. If land surface datum changes were identified, verify documentation in NWIS.
- Verify the measured water-level value and metadata. The field notes should document proper data collection technique by showing two consecutive water-level measurements within proper range; additional water levels may be needed if conditions were not static or if other measurement difficulties were encountered (wet casing, partial obstructions, etc). Notes should indicate deviations from the protocol. Metadata entered into the NWIS database should be accurate and properly describe site status, data accuracy, data collection method, and other conditions.
- Verify site inspection XML file from MONKES/SVMobileAQ is properly archived.
- Review hydrograph comparing the new and historic measurements.
- Verify Station Analysis has been properly completed. Provide a brief written final assessment of the period of analysis; this may include answers to questions or explanations contained in the Approval Guidelines.
- Ensure the Station Description is current and relevant and has been properly updated to reflect any changes made or observed during analysis period. For continuous-record sites, this step can be done at the continuous-record approving stage.

After completing the above described tasks for discrete records, approve/reject discrete data values for the analysis period. Currently, this is done through the NWIS ApproveWL application for all discrete groundwater level records and through the records management system for all routine discrete groundwater level records.

Auditing Groundwater Level Records

Routine Auditing of Groundwater Level Records

Routine audits are not required for groundwater-level records, but WSCs may elect to perform audits at regular intervals to verify the effectiveness of the approval process.

Non-routine Auditing of Groundwater Level Records

Non-routine audits occur anytime an aspect of an approved record is re-examined. For example, an end user may question a published period of unusually low water levels or a series of spikes in the historic water-level record. Errors found during non-routine audits are subject to defined error threshold criteria for revisions. Non-routine audits do not have any required tasks aside from documentation of the audit to include: the date of the audit, the auditor, what was examined, why it was examined, and the outcome of the audit to include a discussion of potential revisions, if any. Another example of a non-routine audit would be a record that is examined during a triennial discipline review. In this case, most aspects of a designated analysis period are examined (superficially or in detail) and the documentation should include the notes or forms that were filled out by the reviewer. Non-routine audits are to be documented by filling out the Audit Template in RMS.