

UVRGA

DATA QUALITY CONTROL REVIEW PROCEDURES

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Introduction

This document describes the procedures that Upper Ventura River Groundwater Agency (UVRGA) staff and consultants will follow when performing data quality control review of groundwater and surface water data collected within the Upper Ventura River Basin (UVRB) and surrounding areas within the Ventura River watershed for use in the Groundwater Sustainability Plan (GSP). Implementation of these procedures is intended to ensure data used in the GSP is credible, as required pursuant to GSP Emergency Regulations §351(h). This document may require updates to address additional types of data, as needed (e.g. biological data concerning groundwater dependent ecosystems). The procedures contained in this document are adapted from United States Geological Survey (USGS) data review procedures.

Data quality control review will be performed prior to data entry into the GSP data management system (DMS) and/or data use for GSP preparation. During its June 14, 2018 discussion of options for a data quality control review process, the Board reached a consensus for implementing data quality control review as part of the GSP workflow under the direction of the GSP PM. Thus, the GSP PM will be responsible for ensuring data is reviewed prior to use in the GSP.

Relationship to GSP Monitoring Network Requirements

Pursuant to Subarticle 4 of the GSP Emergency Regulations, the GSP must include a monitoring network that includes monitoring objectives, monitoring protocols, and data reporting requirements. Suggested practices for developing the monitoring network are provided in Department of Water Resources (DWR's) Best Management Practice (BMP) titled *Monitoring Networks and Identification of Data Gaps, dated December 2016*.

The required components of the monitoring network are:

1. **Monitoring Objectives**: The GSP must include a description of the monitoring network objectives for the basin, which will be developed in conjunction with the sustainable management criteria during the planning process. In general, the network will need to be capable of capturing data on a sufficient temporal frequency and spatial distribution to demonstrate short-term, seasonal, and long-term trends in basin conditions for each of the sustainability indicators, and provide enough information to evaluate GSP implementation. DWR's monitoring network and monitoring protocols BMPs suggest using the Data Quality Objective (DQO) process laid out in the U.S. EPA Guidance on Systematic Planning Using the Data Quality Objectives Process to develop the DQOs. One of the last steps in the DQO process is to determine what quality the data must have to achieve the monitoring objectives.
2. **Monitoring Protocols**: UVRGA adopted the Monitoring and Data Collection Protocols on May 10, 2018.
3. **Data Reporting Requirements**: Pursuant to GSP Emergency Regulations § 354.40, the Agency must store monitoring data in a data management system (DMS) that is capable of storing and reporting information relevant to the development or implementation of the GSP and monitoring of the basin. Monitoring data must be included in the required annual reports and submitted electronically on forms provided by DWR. The data management system will be created during the GSP development.

Data quality control is not explicitly required by the GSP Emergency Regulations but is mentioned in the BMP summary of the suggested EPA DQO process (see Monitoring Network Component No. 1). One of the last steps in the suggested in the BMP is to “Specify performance or acceptance criteria – Determine what quality the data must have to achieve the objective and provide some assurance that the analysis is accurate and reliable.” DWR suggests that the data performance or acceptance criteria be defined relative to the quantitative measurable objectives and minimum thresholds for each applicable sustainability indicator that will be included in the GSP.

Applicability

The data review procedures contained in this document shall be applied to all data stored in the UVRGA DMS, regardless of the data source and regardless of whether the data is ultimately utilized to develop the GSP. Data shall be reviewed prior to storage in the DMS and/or use in developing the GSP. Data obtained from the USGS shall be considered to have met already the requirements of this section without further review, provided any USGS data qualifiers are included in the DMS (e.g. provisional status, etc.).

Data Reviewer Qualifications

An overarching requirement of SGMA is for all personnel to be fully trained and working under the supervision of a California Professional Geologist, Certified Hydrogeologist, or Professional Civil Engineer (herein referred to as the “responsible professional”). Additionally, the USGS requires that data reviewers be experienced in working with the particular type of data being reviewed and possess the expertise and tools to access and assess both the data and associated metadata.

Data Quality Control Review

The following data quality control review procedures are adapted from the USGS Data Review Checklist https://www2.usgs.gov/datamanagement/documents/DataReviewChecklist_2014.pdf. Language taken directly from the USGS checklist is indicated by italic font.

Prior to storing data in the DMS or using data for GSP purposes, data and associated metadata shall be approved by a data reviewer. Review is necessary to ensure that the data are well documented and are complete, consistent, accurate, and precise as needed to achieve the goals for which they were created. Data review may be carried out by one or more qualified reviewers, but reviewers will need to examine both data and metadata in order to understand the data and to ensure that the metadata accurately describe the data. To maintain objectivity, reviewers should not be chosen from the people who collected the data. Following review, the data, metadata, and data quality control review results should be loaded into the DMS.

Review Procedures for Data Collected by UVRGA

The review procedures consist of implementing the USGS Data Review Checklist.

Data releases require a minimum of one review of the data and one review of the accompanying metadata. The special focus of the data reviewer is the accuracy, completeness, and usability of a data product. The following checklist is provided for the assistance of data reviewers who are experienced in working with the particular type of data being reviewed. It is assumed that data reviewers have the expertise and tools to

access and assess both the data and the metadata, and are familiar with standard practices within the relevant discipline.

In some cases, it will be unreasonable to actually check every data value, so a spot check or a check of a carefully selected sample may need to suffice. In this case, the data review report should indicate that a spot check or selected sample was examined.

A data review should consider the following:

- *Are the data what the author says they are?*
- *Are data values reasonable? Do they meet specifications for quality, accuracy, and completeness as identified by both the author and the approving official? This might include specific checks such as:*
 - *Are they in a valid range for that measurement?*
 - *Do they display seasonal or daily trends that are expected? Is there consistency between adjacent or otherwise related datasets, within the product?*
 - *Are the geographic locations given for the data reasonable?*
 - *Is the accuracy claimed for the data reasonable?*
 - *Are data anomalies or gaps explained in the metadata? Are “no data” values accurately defined?*
 - *Do analysis values add up? (where applicable)*
- *Consider any other requirements.*
 - Other requirements include but are not limited the following:
 - Adherence to UVRGA’s Monitoring and Data Collection Protocols (which satisfies GSP Emergency Regulations § 352.2)
 - GSP Emergency Regulations § 352.4 Reporting Standards, which will be appropriately documented in the metadata:
 - Units:
 - Water volumes shall be reported in acre-feet.
 - Surface water flow shall be reported in cubic feet per second
 - Groundwater flow shall be reported in acre-feet per year.

- Units and Accuracy:
 - Field measurements of elevations of groundwater, surface water, and land surface shall be measured and reported in feet to an accuracy of at least 0.1 feet relative to NAVD88, or another national standard that is convertible to NAVD88, and the method of measurement described.
 - Reference point elevations shall be measured and reported in feet to an accuracy of at least 0.5 feet, or the best available information, relative to NAVD88, or another national standard that is convertible to NAVD88, and the method of measurement described.
 - Geographic locations shall be reported in GPS coordinates by latitude and longitude in decimal degree to five decimal places, to a minimum accuracy of 30 feet, relative to NAD83, or another national standard that is convertible to NAD83.
- Monitoring sites shall include the following information:
 - A unique site identification number and narrative description of the site location (for wells – CASGEM well identification number if available);
 - A description of the type of monitoring, type of measurement taken, and monitoring frequency; and
 - Location, elevation of the ground surface, and identification and description of the reference point.

Review Procedures for Data Collected by other Entities

In accordance with SGMA requirements, UVRGA will rely on the best available information and science to prepare the GSP, which will likely result in the utilization of data collected by other entities. To ensure data collected by other entities is credible (GSP Emergency Regulations § 351(h)), the above-listed procedures for reviewing data collected by UVRGA will be followed to the maximum extent practicable. Because other entities are not obligated to following UVRGA’s Monitoring and Data Collection Protocols, the data reviewer will take additional steps to review documentation of the data collection procedures. The reviewer will also consider whether the data was collected under the supervision of a licensed professional geologist or engineer.

Review Documentation

The data reviewer shall document the data quality control review results using the following DMS database fields:

- Reviewer – Name of the responsible licensed professional
- Review_Date – Date of review
- Review_Batch – A unique identifier that will be assigned to all records in a particular data review batch (the identifier will be linked to a separate database table that provides batch documentation)
- Review_Result – The data review result:
 - Approved – data approved without condition
 - Qualified – data approved for use with caution or with data use limitation(s)
 - Rejected – data not approved for GSP use
- Review_Flag – A code that describes the reason for qualified or rejected status (applies only to qualified or rejected data)
- Review_Comment – Optional field, used as needed to provide information deemed relevant by reviewer, e.g. elaborate on reason for qualified or rejected status