Drinking Water Source Adequacy Requirements

Pursuant to Arizona Administrative Code (AAC) R19-4-603(1), Technical Capacity Requirements, the Arizona Department of Environmental Quality (ADEQ) requires the following information be provided to meet the meet the "50 gallons per person per day" 100-year availability requirements of the rule. The purpose of predicting long-term drawdown is to evaluate whether the aquifer (based on aquifer test data) will provide sufficient yield to support the public water system consumptive use. The predicted drawdown should be calculated from aquifer parameters determined from the aquifer test, the required long-term pumping rate, and an assumed continuous pump period. The following is a general summary of the minimum hydrologic informational requirements ADEQ needs to determine if minimum water quantity requirements of rule are satisfied.

Introduction/General Summary
Demand Description
Aquifer Characterization
Impact Analysis
Conclusions

Introduction/General Summary – Aside from a general description of the project, please provide a basic site map(s) which should include, but is not limited to, information such as the facility address or location with an appropriate scale:
(e.g., bar scale with 1 inch = 20 feet, etc.), north arrow, well location(s), property boundaries and any land features (i.e., lakes, rivers, streams, irrigation canals), groundwater basin(s) and groundwater sub basin(s) in which the project is located.

Demand Description - A description of project demand (application demand). The long-term pumping rate (LTPR) should be determined as follows:

> LTPR = Number of residential and/or commercial occupants x (50) gallons per day. The number of residential and/or commercial household occupants shall equal current and total projected occupants that will be served by the public water supply (projected demand).

Aquifer Characterization and Evaluation – A depiction of the aquifer including, but not limited to, a description of the geologic units and structural features (including geologic maps and cross sections) and an evaluation of the depth to bedrock within the project/regional study area. Well drilling/construction logs (including subsurface lithology information), aquifer test results and parameters including natural recharge/discharge rates must be included and evaluated. Additionally, current and historic groundwater level measurements of all on-site wells shall be included. An aquifer pre-test (step test) shall be performed to determine the constant pump rate that can be maintained throughout the length of the desired test. Aquifer testing shall be conducted for a minimum of 24 consecutive hours after the drawdown has stabilized, as determined by the supervising engineer or geologist. Recovery shall be measured until the water level(s) are at least 90% of pre-pumping level.

Exemptions to the 24-hour minimum can be made on a case by case basis at the direction of ADEQ. All aquifer test(s) shall be performed in general accordance with the ASTM Aquifer Test Guidelines for the selection of aquifer test methods and withdrawal and injection criteria for determining hydraulic properties of aquifer systems. Documentation for the aquifer pump test data analysis should, at a minimum, consist of the following:

a) The date, times, elapsed times, measured water level data, discharge rates, and any observations or measured physical properties obtained as part of the pumping test.
b) The data analysis methods used.
c) Justification for using these methods.
d) Any aquifer property and well construction data used in the data analysis.
e) Plots showing both drawdown data and type curves used.
f) Plots showing both recovery data and type curves used.
The calculated transmissivity, conductivity, and storativity data for each well used. If only a single well test was completed and storativity values cannot be calculated then the appropriate default values for the specific aquifer type should be used.

Discharge water shall be pumped to a down gradient location as distant from the wellhead as practical if there is any possibility that the discharge water may infiltrate to the aquifer and affect water drawdown data.

Impact Analysis Studies – Documentation (utilizing analytical and/or numerical modeling) that groundwater pumping to meet total project/area demand will not cause depth–to-static water levels to exceed the maximum 100-year depth-to-static water of 1200 feet below land surface (outside Active Management Areas), depth to bedrock or the saturated thickness of the source aquifer. Additionally, the hydrologic study must detail and justify the use of the selected modeling technique. Inside the Phoenix, Tucson and Prescott AMAs, the depth to water after 100 years of pumping cannot exceed 1,000 feet. Inside the Pinal AMA, the depth to water after 100 years of pumping cannot exceed 1,100 feet below land surface. Outside Active Management Areas ADEQ may grant a variance to use a lower 100-year depth-to-static water level if the applicant adequately demonstrates groundwater is available at the lower depth. The variance from the maximum depth-to-static water criterion is intended to apply only where groundwater naturally occurs in hardrock aquifers at depths greater than 1200 feet below land surface. Generally speaking hardrock aquifers in sandstone, limestone, and shale type formations would be eligible for the depth exemption.

Conclusion - A narrative summary of the relevant features of the hydrologic study and set of conclusions concerning the physical availability of the 100-year water supply.

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