LOCAL GROUNDWATER ASSISTANCE GRANT PROGRAM

APPLICATION

ATTACHMENT 8

QUALITY ASSURANCE

UPPER SAN GABRIEL VALLEY
MUNICIPAL WATER DISTRICT

UPPER DISTRICT GROUNDWATER REPLENISHMENT MODEL

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Attachment 8 Quality Assurance

Upper District will use appropriate and well-defined Quality Assurance and Quality Control (QA/QC) measures for all tasks described in the Work Plan (see Attachment 5) for the “Upper District Groundwater Replenishment Model”.

As discussed in the Work Plan, additional modeling (three-dimensional) will be conducted for the proposed groundwater recharge areas of the Main Basin in order to supplement the simulation results of the existing overall Main Basin model (two-dimensional).

The existing two-dimensional model of the Main San Gabriel Basin was performed with Prickett Lonnquist Aquifer Simulation Program (PLASM) first published in 1971 by the Illinois State Water Survey. PLASM has been used to model water levels, capture zones, travel times, flow paths, well interference, mounding effects, and adjective transport within the Main Basin for the past 15 years. The existing model is also use to support annual reports prepared by the Main San Gabriel Basin Watermaster, a Los Angeles County Superior Court appointed agency which administers the Main San Gabriel Basin Judgment. The existing Main Basin model based on PLASM was calibrated by comparing simulated water level, drawdown, transmissivity, and storage coefficient data with measured data to enhance accuracy of modeling results.

The “Upper District Groundwater Replenishment Model” will perform additional modeling of Main Basin through use of MODFLOW, an industry standard three-dimensional groundwater flow model first released by the United States Geological Survey in 1984. MODFLOW was selected for this project because it is well-documented and widely used by researchers, consultants, and government agencies. Construction of the three-dimensional numerical model will commence with a goal of simulating historical conditions. Referred to as a steady-state model run, average annual historical conditions will be simulated to ensure that the model accurately accounts for all sources and sinks of water. The steady-state solution will be checked against historical

groundwater contour maps and the steady-state solution generated by the existing model under the same conditions. In addition, the steady-state drawdown at each pumping node will also be checked with the measured drawdown available from the aquifer performance test data conducted at the well(s) that node represents to ensure the reasonability of the model solution.

Following completion of the steady-state model run, a transient run will be performed to simulate changes in groundwater flow conditions during a balanced hydrologic period. The transient simulation is used to verify the model as well as determine its use and limitations based on comparison of model simulated results to observed data. The transient flow model will simulate changes in groundwater conditions throughout the calibration period to verify that the set of calibrated parameters reproduce measured field data. A sensitivity analysis will be conducted to quantify the uncertainty in the calibrated model. The differences in simulated and measured groundwater levels and streamflow from the calibrated solution will be used for determining the sensitivity of the overall Project model.

Upper District will work closely with modeling staff to ensure execution of the “Upper District Groundwater Replenishment Model” in a timely and cost effective manner. Upper District intends to provide an accurate and high quality product. All work products developed by Upper District are directed by experienced staff, including California registered Civil Engineers, Geologists, and Hydrogeologists. All work products will be reviewed by peers or supervisors and copies of all submittals are retained by Upper District as well as all comments and correspondence received from others. The model will be peer reviewed by a qualified professional with experience in groundwater modeling.