

## II. HYDROLOGIC STUDIES

### A. Development of Hydrologic Parameters

Based on watershed reconnaissance studies, and following discussions with both the District and the Town, the following hydrologic parameters were obtained or developed:

- Watershed drainage areas based on USGS quadrangle maps;
- Hydrologic soil types obtained from the District's Hydrology Manual;
- Rainfall data obtained from the District's Hydrology Manual;
- Land uses throughout the study area based on updated land use planning incorporated in the Town's General Plan document; and
- Loss rate parameters for both Antecedent Moisture Conditions II and III.

Rainfall isohyets, hydrologic soil types, land uses, and USGS topography were incorporated in the GIS. These data are also provided on hard copy in Appendix B.

Prior to initiating rational method hydrology studies, the above listed parameters were reviewed and approved by the District.

### B. Rational Method Hydrology Studies

Following approval of the hydrologic parameters, a detailed hydrology map at a scale of 1 inch = 1000 feet was prepared. The detail of watershed subarea delineation was guided by Hydrology Manual requirements for calculating accurate times of concentration. Flow or flood routing paths were identified for all regional, secondary and local drainage courses. The criteria defining these specific drainage courses are as follows:

- **Regional Facilities** – Major drainage courses usually having a tributary mountain watershed area greater than one square mile and an outlet to a principal facility such as a river or lake. In general, the 100-year design discharge exceeds 750 cfs.

- Secondary Facilities – Larger drainage courses, generally tributary to a regional drain, conveying locally generated flows. In general, the 25-year design discharge exceeds 300 cfs and requires a flow area exceeding 20 square feet (60-inch diameter pipe).
- Local Facilities – All remaining drainage courses used to convey smaller locally generated flows which are tributary to secondary or regional drainage systems.

One hundred year and twenty five year peak discharges were computed utilizing the previously approved watershed subarea delineation map with defined flow paths. Calculations were performed for both the non-detained and detained facilities using AES computer software. Selected peak discharges resulting from the computations, which were used for sizing both non-detained and detained drainage facilities, are summarized in Tables 1 and 2, respectively.

The results of all rational method calculations, including times of concentration and peak discharges both return periods are included in Appendix C.

#### C. Unit Hydrograph Studies

Unit hydrograph studies were performed to generate hydrographs and peak discharges at selected nodal points. Nodal points selected for hydrograph calculations were at proposed detention basin sites and at other locations along regional system drainage courses for comparison with rational method peak discharges. Times of concentration generated from rational method calculations previously approved by the District were used for unit hydrograph calculations. Specific criteria, methodology and study results are included in Appendix C.

Peak discharges utilized for sizing non-detained and detained Master Plan facilities are summarized in Tables 1 and 2, respectively.