

V - DATA COLLECTION AND COMMUNICATION NETWORKS

5-01. Hydrometeorological Stations

a. Facilities. Hydrologic instrumentation installed at Brea Dam provides data on reservoir water surface elevation, downstream gauge height, precipitation, and the outlet gate openings. A list of the instrumentation and available data is provided on plate 5-01. Data collection facilities of interest in the vicinity of Brea Dam, the Brea Creek gauging station, and nearby precipitation gauges are shown on plate 5-02. These facilities with all pertinent hydrometeorological instrumentation are listed on plate 5-03. The instrumentation located at or near Brea Dam are detailed below.

(1) Reservoir Water Surface Recording System. Two tape-float-pulley assemblies are used within two float wells to measure the water surface elevation. The lower well uses a Stevens A-71 strip-chart recorder and a digital recorder to automatically record the float water surface elevation from elevation 208 to 231. A Stevens A-35 strip-chart recorder and a digital recorder automatically records the float water surface elevation from elevation 231 to the top of the dam.

(2) Reservoir Staff Gauges. A series of staff gauge boards are installed along the upstream face of the dam. The boards are graduated in 0.10 foot increments and are readable from the top of the dam.

(3) Outlet Gate Recorders. Both outlet service gates have a Stevens Type "F" recorder that documents all gate movements. These recorders monitor gate settings and make permanent paper records of them.

(4) Precipitation Measurement. A tipping-bucket rain gauge is installed at the Brea Dam control house. The amount of rainfall is measured by the tips of the bucket. Each tip is equal to 0.01" of rainfall. A magnetic sensor in the gauge sends a signal to a digital recorder after each tip. Rainfall is also measured by a glass rain tube and a Belfort recording gauge. The paper charts from the Belfort gauge are sent to the National Weather Service for publication.

(5) Stream Gauge Stations. Hydrologic facilities for obtaining downstream streamflow data includes U.S. Geological Survey (USGS) gauge #11088500 below the dam and an Orange County Environmental Management Agency (OCEMA) gauge station at Darlington Avenue. The USGS gauge uses a slant manometer with a Stevens digital recorder to measure and record the flow. The OCEMA gauge station houses the COE's Stevens A-71 strip chart recorder with the float-tape and float-tape indicator. Rating tables for both gauges are provided on plates 5-04 and 5-05 and rating curves are shown on plate 5-06.

b. Reporting. Hydrological data from Brea Dam are reported in three separate ways. Readings are made manually by the dam operator, recorded automatically by gauges, and reported in real-time by the telemetry system.

(1) Manual. The dam tender at Brea Dam reports via radio or telephone each morning between 15 November and 15 April to the Reservoir Regulation Unit. The report includes water surface elevation, downstream stage, rainfall and gate settings. This report is made more frequently during periods of rain, as

specified by the Reservoir Regulation Unit. Between 15 April and 15 November, reports are made every Monday morning.

(2) Recording Instrument. Measurements recorded by the Stevens strip-chart recorders or digital recorders are stored on paper strip charts or paper punch tapes. These paper records are retrieved on a -monthly basis in the rainy season, and on a quarterly basis the remainder of the year, and kept on file by the Water Control Data Unit.

(3) Telemetry System. Hydrologic data measured at the dam and other gauges are transmitted to the Los Angeles District Office by the Los Angeles Telemetry System (LATS). The event mode is the primary data transmission mode for the telemetry system. As a gauge registers an event, current data are transmitted by a remote terminal unit (RTU) by a line-of-site radio to a repeater. The data is then relayed via microwave to the LAD office. Each RTU is programmed to trigger whenever 0.04 inches of precipitation, or a 0.25-foot change in water surface elevation, is measured. These RTU's automatically transmit reports at predetermined 24-hour intervals. All RTU's can also be interrogated at any time for current data by the Los Angeles Telemetry System Central Station.

(4) Alert System. There is also an event reporting gauge system throughout southern California sponsored by the National Weather Service. This system is referred to as the ALERT System (Automatic Local Evaluation in Real Time). OCEMA maintains a network of these gauges in Orange County. Included in this network are precipitation station #265 in the City of Brea, and precipitation station #241 located at Miller Basin on Carbon Canyon Creek. Access to this information can be obtained through the REPORT Program on the Water Control Data System computer.

c. Maintenance. The Water Control Data Unit of the Reservoir Regulation Section, Engineering Division, LAD, is responsible for maintaining the hydrometeorologic instrumentation owned by the Corps of Engineers.

5-02. Water Quality Station. There are no water quality stations in the watershed above the dam or in the downstream channel.

5-03. Sediment Stations. There are no sediment stations in the watershed above Brea Dam or along the downstream channel of Brea Creek.

5-04. Recording Hydrologic Data. Hydrologic data from Brea Dam is recorded and stored in several forms. A report of daily observations is made by the dam tender at the dam and this record, form SPL-19, Flood Control Basin Operation Report, is stored by the Water Control Data Unit of the Reservoir Regulation Section in the District's base yard office. Using this report and strip charts of reservoir water surface elevation, reservoir computations are made by the Water Control Data Unit on form SPL-30, Reservoir Computations. The same information transmitted by radio or telephone to the Reservoir Regulation Unit is recorded on form SPL-424,

Reservoir Operation Report. This information is entered into the RESCAL computer program which stores the record in a computer database and produces a "Daily Reservoir Report" that is issued by the Reservoir Regulation Unit each work day. However, the form SPL-30, is the official hydrologic record of reservoir data for the District. Rainfall records at Brea Dam are kept on form SPL-31 "Rainfall Records" by the dam tender and are stored by the Water Control Data Unit. During the activation of the Reservoir Operation Center in response to a flood situation, radio and telephone calls are logged for permanent record on form SPL-188 "Record of Calls" and are kept on file by the Reservoir Regulation Unit. Examples of these report forms are shown in figures 5-01 through 5-05.

The telemetry system also stores its data in a computer data base file. Paper punch tapes and strip charts retrieved from recording instruments at Brea Dam are stored by the Water Control Data Unit at the District's base yard office.

The USGS publishes daily mean streamflow recorded at the Brea Creek gauge #11088500 in the yearly publication Water Resources Data for California, Volume 1. The paper punch tapes for this gauge are archived by the USGS. The strip chart of precipitation at Brea Dam is sent to the National Climatic Center in Asheville, N.C. for publication in the NOAA monthly report Hourly Precipitation Data.

The State of California, Department of Water Resources, publishes data from the ALERT telemetry gauge network on a monthly basis. The Orange County Environmental Management Agency, the adjacent Ventura County Flood Control District and the Los Angeles County Department of Public Works archive their recording and non-recording data and furnish these data to other agencies upon request.

5-05. Voice Communication Network. The LAD maintains a voice radio communication network connecting all of its operations. This FM radio system uses repeaters on Mount Disappointment or, alternately, Pleasants Peak to communicate between the District Office and Brea Dam.

Power at the District Office, as well as at each dam, is backed up by an emergency generator system. If all systems fail at the District Office, there is a complete radio system eleven miles east at the District's Base Yard in El Monte.

5-06. Communication with Project.

a. Regulating Office With Project Office. During the flood season (15 November through 15 April), a routine radio call is made at least once each weekday from the Reservoir Regulation Unit to each dam tender, including Brea Dam. This reservoir operation report ("morning report") is usually made at 0800 hours, Monday through Friday (see fig. 5-05). During flood events the reporting interval is usually reduced to one hour, with the Reservoir Regulation Unit originating the call. Other routine or non-routine radio or telephone calls are made as needed.

In the event that all communications with the District Office, including the Base Yard, should be interrupted, a set of "Standing Instructions to the Project Operator for Water Control" have been compiled for each dam. A copy for Brea Dam is included in Exhibit A of this manual.

b. Between Project Office and Others. No routine communication exists between Brea Dam and other agencies.

c. Between Regulating Office and Others. Before and during the earliest stage of any reservoir releases, the Reservoir Regulation Unit notifies officials of Orange County and the City of Fullerton. A list of agencies to be notified, with applicable office and home telephone numbers, is published annually in the LAD's Instructions for Reservoir Operations Center Personnel (the "Orange Book"). The 1989 notification list is provided in table 5-01.

Table 5-01.

Brea Dam Notification List

<u>Organization</u>	<u>Office Phone No.</u>
Orange County Communications Center (24 hrs.)	714-834-7167
Fullerton Police Department	714-738-6800
California Office of Emergency Services	916-791-4305
City of Fullerton	714-738-6306
Orange County Environmental Management Agency	714-567-6300
Orange County Sheriff	714-647-7000
Maureen Peek Stables	714-441-1370
Corps of Engineers (El Monte)	626-401-4008
Corps of Engineers Emergency Management Branch	213-452-3424

5-07. Project Reporting Instructions. During periods of dam operation, communications between the Reservoir Regulation Unit and each affected dam tender are made on a frequent basis, normally once each

hour". If a gate change is required, the Reservoir Regulation Unit (radio call sign WUK 4ROC) broadcasts the gate change instructions to the dam tender. When the gate change is completed, the dam tender calls back with the information of the change. Other special instructions to the dam tenders are conducted in a similar manner. This network of radio communications is also used by the dam tender to report any mechanical failures or other problems at the dam.

5-08. Warnings. The responsibility for issuing all weather watches and warnings and all flood and flash flood watches and warning rests with National Weather Service. Local emergency officials of cities and counties are responsible for issuing any public warnings regarding unusual overflows, evacuations, unsafe roads or bridges, toxic spills, etc. The U.S. Army Corps of Engineers is responsible for providing these officials with current information and when possible, forecasts of water surface elevations and releases at Brea Dam. If an uncontrolled spillway flow or dam break were imminent, the Reservoir Regulation Unit should notify the OCEMA Communication Center so they could initiate evacuations, in addition to the other notification in the "Orange Book".