# SAN GORGONIO PASS WATER AGENCY
# 1210 Beaumont Avenue, Beaumont, CA
# Board of Directors Engineering Workshop
# Agenda
# October 14, 2019 at 1:30 p.m.

1. **Call to Order, Flag Salute and Roll Call**

2. **Public Comment:** Members of the public may address the Board at this time concerning items relating to any matter within the Agency's jurisdiction. To comment on specific agenda items, please complete a speaker's request form and hand it to the board secretary. Speakers are requested to keep their comments to no more than five minutes. Under the Brown Act, no action or discussion shall take place on any item not appearing on the agenda, except that the Board or staff may briefly respond to statements made or questions posed for the purpose of directing statements or questions to staff for follow up.

3. **Discussion of Proposed USGS Cooperative Agreement 2019-2020* (p. 2)**

4. **Announcement:**
   A. Regular Board Meeting, October 21, 2019 at 1:30 p.m.
   B. Finance and Budget Workshop, October 28, 2019 at 1:30 p.m.
   C. Regular Board Meeting November 4, 2019 at 1:30 p.m.

5. **Adjournment**

***Information included in Agenda Packet**

(1) Materials related to an item on this Agenda submitted to the Board of Directors after distribution of the agenda packet are available for Public inspection in the Agency's office at 1210 Beaumont Avenue, Beaumont during normal business hours. (2) Pursuant to Government Code section 54957.5, non-exempt public records that relate to open session agenda items and are distributed to a majority of the Board less than seventy-two (72) hours prior to the meeting will be available for public inspection at the Agency's office, located at 1210 Beaumont Avenue, Beaumont, California 92223, during regular business hours. When practical, these public records will also be made available on the Agency's Internet Web site, accessible at http://www.sgpwa.com." (3) Any person with a disability who requires accommodation in order to participate in this meeting should telephone the Agency (951 845-2577) at least 48 hours prior to the meeting in order to make a request for a disability-related modification or accommodation.

# San Gorgonio Pass Water Agency Cooperative Program: Progress, Plans, and Costs

# Task 1 – Groundwater-Level Monitoring

## *Progress*

A basin-wide groundwater-level monitoring network was established in the San Gorgonio Pass area in Federal Fiscal Year 1997 (FFY97) to evaluate existing hydrologic conditions and to monitor the effects of pumping and artificial recharge on the groundwater system. A key component of the network is collecting data from the multiple-well monitoring sites, which provide information on water-level changes and vertical gradient in the different aquifers.

In FFY19, U.S. Geological Survey (USGS) personnel accompanied San Gorgonio Pass Water Agency (SGPWA) personnel in the spring and fall to measure water levels at 107 wells. Data collected as part of the water-level network are available through the USGS National Water Information System (NWIS) online database (table 2).

### Water-Level Change

Water-level changes measured in the monitoring wells between fall 2017 and fall 2018 and spring 2018 and spring 2019 are shown on figures 1 and 2, respectively. Of the 76 wells with water-level change between fall 2017 and 2018, 3 wells recorded a water-level rise greater than 5 ft, 50 wells recorded little or no change (rise or decline less than 5 ft), and 23 wells recorded a water-level decline greater than 5 ft (fig. 1). Of the 73 wells with water-level change between spring 2017 and 2016, 14 wells recorded a water-level rise greater than 5 ft, 46 wells recorded little or no change (rise or decline less than 5 ft), and 13 wells recorded a water-level decline greater than 5 ft (fig. 2).

### Multiple-Well Monitoring Sites

In FFY19 the USGS completed three new monitoring sites east of Cabazon. These sites have a total of 11 new monitoring wells. The total number of transducers that will collect and record continuous water-level data at multiple-well monitoring sites 1, 6, 8, 9, and 10-13 during FFY20 has increased from 15 in FFY19 to 26 in FFY20 (fig. 1). These data were used to help determine vertical gradients in the aquifer system and document long-term water-level changes in the SGPWA service area.

***Site 1***—Water-level data collected at well 27L1 (Site 1) indicate about 77 ft of water-level decline between December 1989 and September 2008 (about 8.5 ft/yr) (fig. 3). However, from September 2008 through early 2014, the water level at 27L1 has increased about 48 ft (about 8 ft/yr). In early 2014, the water-level measured at well 27L reached 15 year high of 2262 ft above sea-level, followed by a 34 ft decline until late 2016. Since late 2016, the water level measured at the well has increased to about 49ft. In 2019, water levels at Site 1 were near 30 years highs measured in 1989

***Site 6***—Site 6 (002S001W35J001-4) is in the northeastern part of the Beaumont storage unit and includes four 2-inch piezometers installed in the same borehole: 35J1 perforated

between 860-900 ft bls; 35J2 perforated between 750-770 ft bls; 35J3 perforated between 610-630 ft bls; and 35J4 perforated between 240-260 ft bls (dry). Prior to late 2008 the water levels measured in the different piezometers at Site 6 (fig. 4) were similar; however, after late 2008 the depth to water in the piezometers increases with the depth of the perforated interval. This change is likely a response to pumping from the nearby BCVWD production well 25. BCVWD well 25 (shown on figure 1 in black) is about 0.7 mile southwest of Site 6 and started regular groundwater production for municipal supply in October 2008. Water levels at the site have declined about 31 ft during the period February 2002 and June 2019. The rate of decline was greater than 5 ft per year (ft/yr) prior to 2010. Since late 2010, all 3 wells have shown recovery of about 24ft between the seasonal highs measured during spring of 2010-2019. All wells at the site have continued to show overall year-to-year recovery since 2010. The recent recovery between fall 17 and summer 2019 at this site may have resulted from changes in pumping patterns in the area, natural recharge from recent wet years, artificial recharge at the SGPWA and BCVWD recharge facilities, or a combination of these factors. Seasonal variation shown in the hydrograph for the period 2008-2019 indicate an increased downward gradient at the site. This is likely a response to recent increased pumping a well 25. Water levels at this site are near high levels not measured since 2006.

***Site 8***—Site 8 (003S002E07P001-4) is in the central part of the Cabazon storage unit and includes four 2-inch piezometers installed in the same borehole: 7P1 perforated between 980-1,000 ft bls; 7P2 perforated between 790-810 ft bls; 7P3 perforated between 640-660 ft bls; and 7P4 perforated between 550-570 ft bls. The hydrographs for site 8 show variations in water levels with depth at the site (fig. 4). In general, the water-level altitude increases with depth at the site with an upward groundwater gradient between the lower and upper aquifer system. The deepest well (7P1) has the highest water level altitude, more than 20-25 ft higher than water-level altitude in the shallower wells. This large difference in water-level altitudes indicates that well 7P1 is perforated in a different aquifer than the other wells. Wells 7P2 and 7P3 also show greater daily variation than wells 7P1 and 7P4. This variation likely is a response to pumping by the nearby supply well used by the Cabazon County Water District, shown as a black dot (fig. 1) 0.3 miles east of Site 8. The water-level decline measured at the site between May 2007 and June 2019 was 53, 50, 49, and 48 ft at wells 7P1, 7P2, 7P3, 7P4, respectively. The steady decline in water level at the site is likely a response to lower than average natural recharge in the area as result of the ongoing drought.

***Site 9***—Site 9 (003S002E15P001-3) is in the eastern part of the Cabazon storage unit and includes three 2-inch piezometers: 15P1 perforated between 373-383 ft bls; 15P2 perforated between 330-350 ft bls; and 15P3 perforated between 240-260 ft bls. Prior to early 2011, water-level altitude in well 15P1 is slightly higher than the water-level altitude in well 15P2, indicating an upward groundwater gradient conditions at the site. (fig. 5). The water-level decline measured at the site between May 2007 and April 2011 was 9.3 ft (about 2.4 ft/yr) at well 15P1and 8.5 ft (about 2.2 ft/yr) at 15P2. In April-May 2011 both wells show rapid increases in water-level altitude at the site. The transducer in well 15P1 recorded a 4.6 ft rise in water table between late-April and late-August 2011. The

transducer in well 15P2 recorded a 10.3 ft rise in water table between mid-May and mid-August 2011. It is important to note that this water-level rise event occurred in the deeper well (15P1) first, then approximately 1 month later, started in the shallower well (15P2). This event also reverses the vertical gradients at the site. This recharge event was likely the result of natural recharge in the area. Since this event in 2011, both wells show nearly parallel water-level decline until early 2015 when well 15P2 went dry. Prior to May 2011 manual water-level measurements collected from the shallow well (15P3) were dry. Manual measures in well 15P3 also captured this water-level rise event with a measured water level at 220.8 ft below land surface or about 115 ft above the water levels measured in wells 15P1 and 15P2. The USGS installed a transducer in well 15P3 in June 2014, and the well showed a water-level rise starting late April 2019 and as of June 2019 the water level in the well was 17 ft above the bottom of the well and about 134 ft above the water level in well 15P1 (right axis, fig. 5). Well 15P2 has been dry since March 2015 indicating perching conditions at the site. The overall decline at well 15P1 is approximately 39 ft and the overall rate of decline is 3.2 ft per year since late 2007. The overall decline at well 15P2 is 11.2 ft and the overall rate of decline is 1.5 ft per year during the period late-2007 and early-2015 when the well went dry.

***Site 10***—Site 10 (003S001E11F001-4) is in the western part of the Cabazon storage unit and includes four 2-inch piezometers installed in the same borehole: 11F1 perforated between 1060 and 1040 ft bls; 11F2 perforated between 860 and 840 ft bls; 11F3 perforated between 660 and 680 ft bls; and 11F4 perforated between 600 and 580 ft bls. The water-level decline measured at the site between August 2009 and November 2011 was 8.8, 8.7, 8.9, and 9.25 ft at wells 11F1, 11F2, 11F3, and 11F4, respectively (fig. 6). During the period November 2011 to June 2013 water-level altitudes at the site increased. The water-level rise measured at the site between November 2011 and June 2013 was 5.5, 5.3, 5.1, and 5.2 ft at wells 11F1, 11F2, 11F3, and 11F4, respectively. Wells 11F3 and 11F4 have nearly identical depth to water and water-level change indicating these wells are in the same aquifer. Since mid-2013, when water levels at the site reached near historic highs, water levels have declined 32 ft at the site. Since late 2013 all wells at the site have shown decline of about 47 ft and rate of decline of about 7.8 ft/yr.

## *Plans*

During FFY20, SGPWA personnel will collect water-level data from groundwater-level monitoring-network wells (fig. 2) on a semi-annual basis. The USGS will continue to canvass new wells and verify well information for wells in the network and add the additional 11 wells associated with the three new monitoring sites completed in FFY19. Water-level data will be collected at one-hour intervals at all sites equipped with pressure transducers (table 2); these sites will be downloaded on a quarterly basis by the USGS. The USGS will continue to enter water-level and well-site data collected by SGPWA and USGS personnel into the USGS database with appropriate quality-control checks, including accompanying SGPWA personnel during both spring and fall measurement periods. Water-level data are available through the USGS NWIS online database. As part of the calibration process completed in FFY14, it was noted that many of the transducers are near

or have exceeded expected serviceable lifetime of the transducers. The factory expected serviceable lifetime of the transducers used at the continuous monitoring sites is between 7-10 years. The USGS will continue to monitor each transducer and recommend replacement as needed. Currently the SGPWA has 26 transducers deployed and the replacement cost is approximately $1,200. SGPWA should expect one or two transducer failures per year for the next 5-10 years until all transducers are replaced.

Total cost for the above work is $65,000. Of this total, San Gorgonio will contribute $59,525 and subject to the availability of Cooperative Matching Funds (CMF), the USGS will contribute $5,475, as reflected in the summary funding table 1.

***Task 1, FFY 2020 cost for water-level monitoring $ 65,000***

## Task 2 – Water-quality Monitoring

### *Progress*

In FFY19, the 11 wells located at the three new monitoring sites were sampled and added to the water-quality network wells. The samples were analyzed for major ions, nutrients, selected trace elements, carbon-14, tritium, stable isotopes of oxygen and hydrogen. Complete results for all samples collected as part of the water-quality monitoring network are available through the USGS NWIS online database. NWIS links to individual wells are provided in table 3.

Per conversation between our respective staffs, it has been decided to restructure the water-quality network to minimize the increase in network costs. As stated earlier, the USGS install three addition monitoring sites with 11 new wells, near the eastern boundary of the San Gorgonio Pass and the Coachella Valley (Fig. 7). These sites added 11 new monitoring sites to FFY19 water-quality network. As part of the FFY19 cooperative agreement, the USGS only sampled the new monitoring sites. In FFY20, the water-quality network will increase the sample interval of each well in the network to sample each well every four years instead of three (previous sample interval). This will allow for each site to be sampled every four years and help maintain reasonable cost of previous years.

# San Gorgonio Pass Water Agency Cooperative Program: Progress, Plans, and Costs

## *Plans*

The FFY18 water-quality monitoring network includes 38 wells. In FFY19 the network increased to about 49 wells, about one fourth of the wells will be sampled on a 4-year basis (about 12-13 wells). The samples will be analyzed for major ions, nutrients, selected trace elements, stable isotopes of oxygen and hydrogen. All data collected will be entered into the USGS database with appropriate quality control and are available upon request.

Total cost for the above work is $64,900. Of this total, San Gorgonio will contribute $60,440 and subject to the availability of Cooperative Matching Funds (CMF), the USGS will contribute $4,460, as reflected in the summary funding table 1.

***Task 2, 2020 cost for water-quality monitoring $ 64,900***

Total cost for tasks 1 and 2 is $129,900. Of this total, San Gorgonio will contribute $60,440 and subject to the availability of CMF, the USGS will contribute $4,460, as reflected in the summary funding table 1

***Total FFY 2020 costs for task 1-2 $ 129,900***

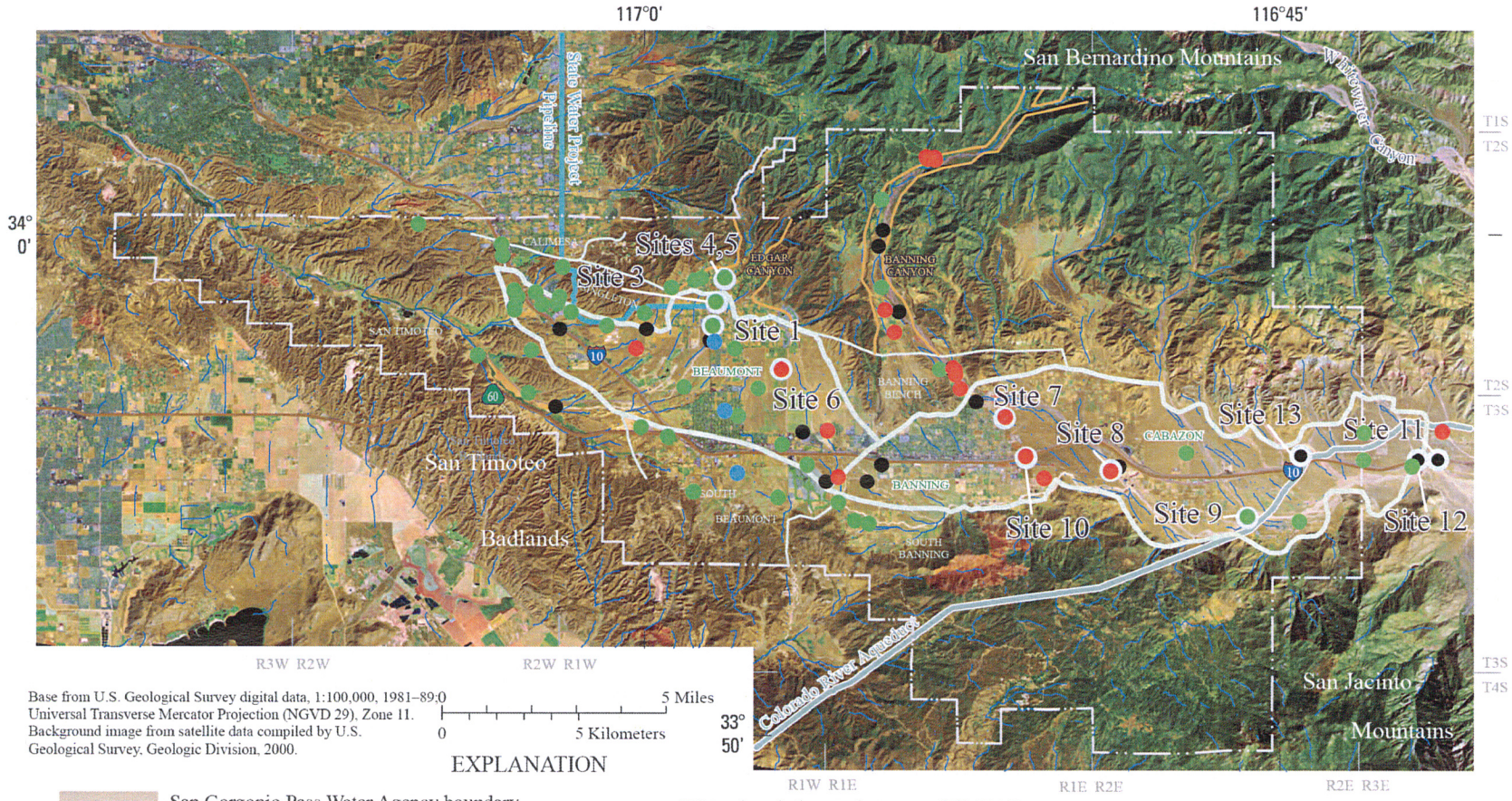



Figure 1. Map showing the water-level network and water-level change between fall 2017 and fall 2018 at selected wells.

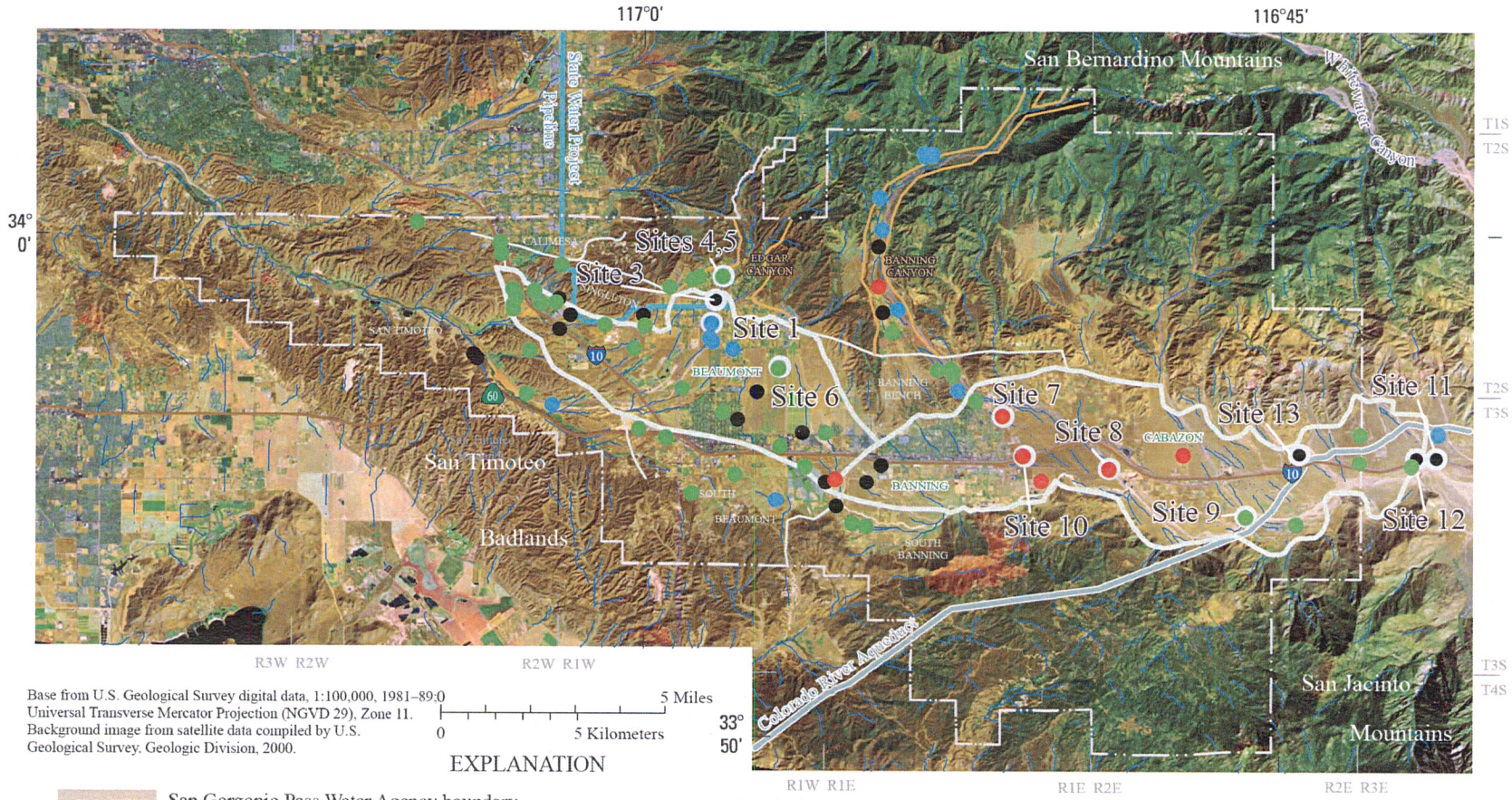



Figure 2. Map showing the water-level network and water-level change between spring 2018 and spring 2019 at selected wells.

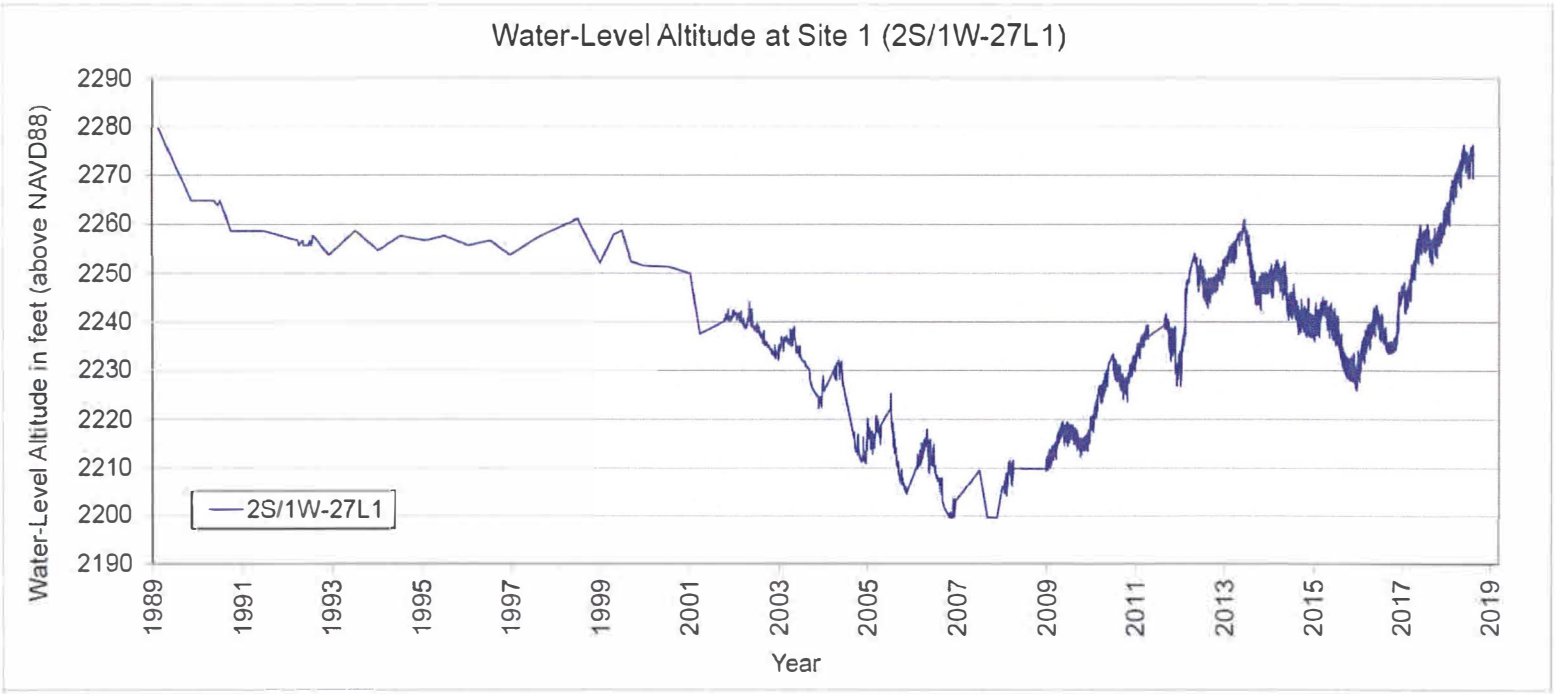
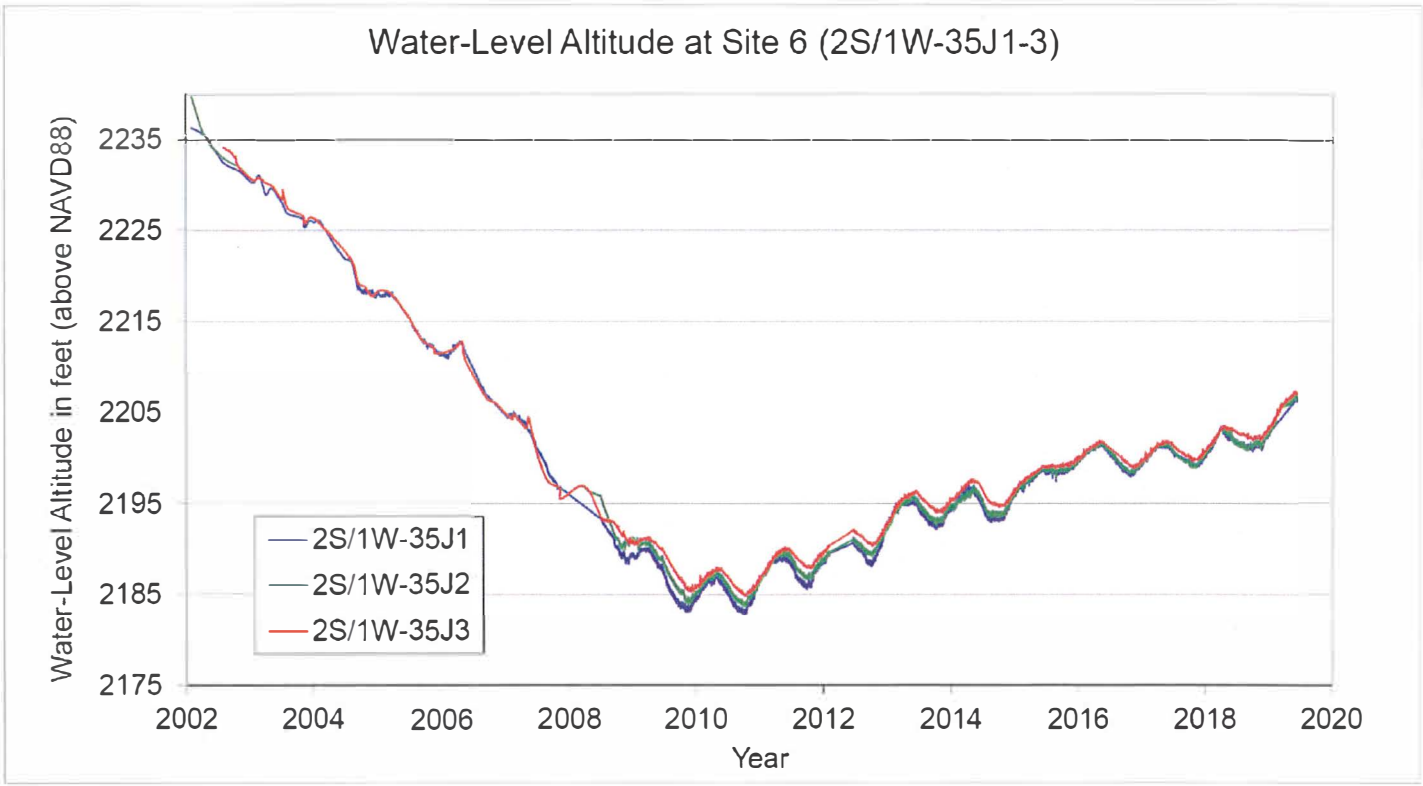



Figure 3. Graph showing water-level hydrograph for site 1.



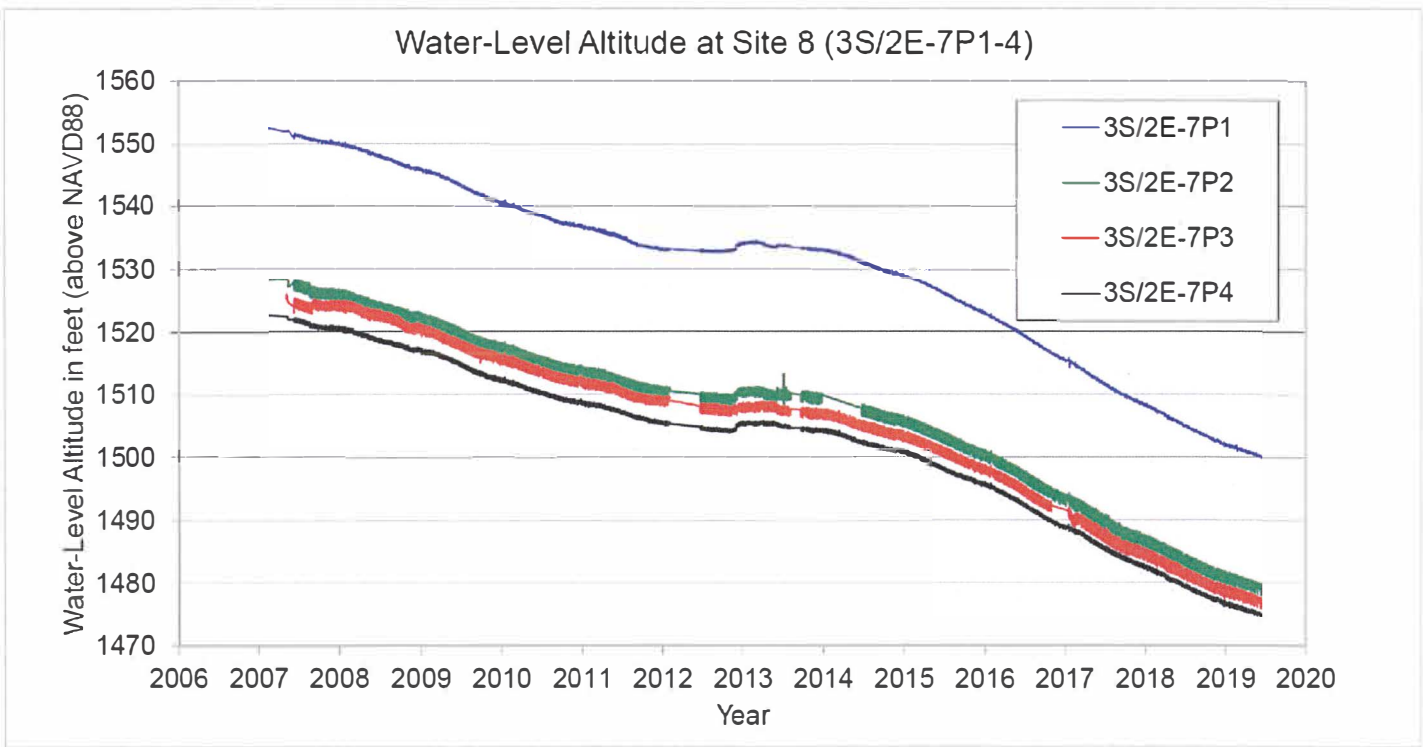




Figure 4. Graph water-level hydrographs for sites 6 and 8

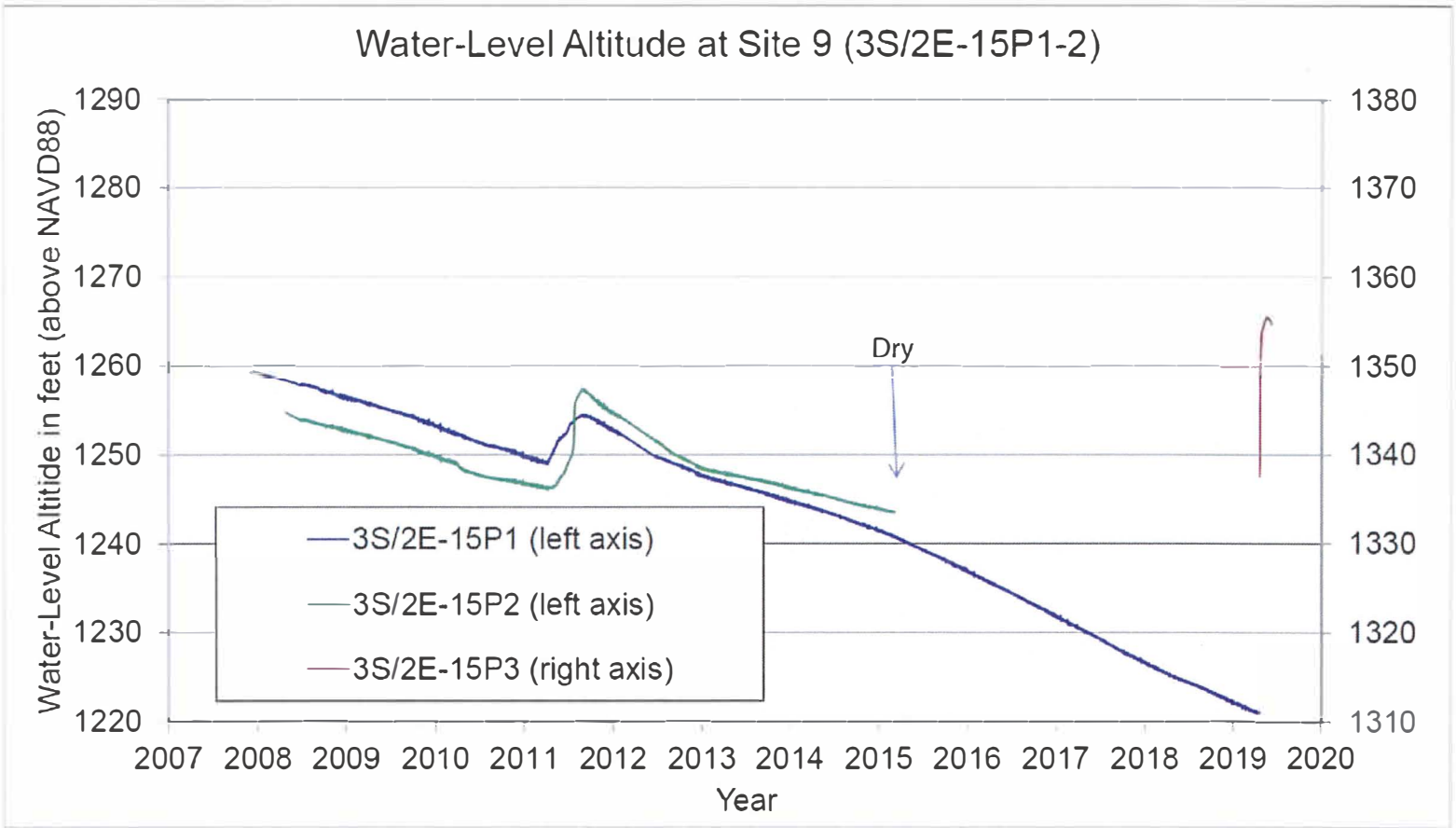



Figure 5. Graph water-level hydrographs for site 9

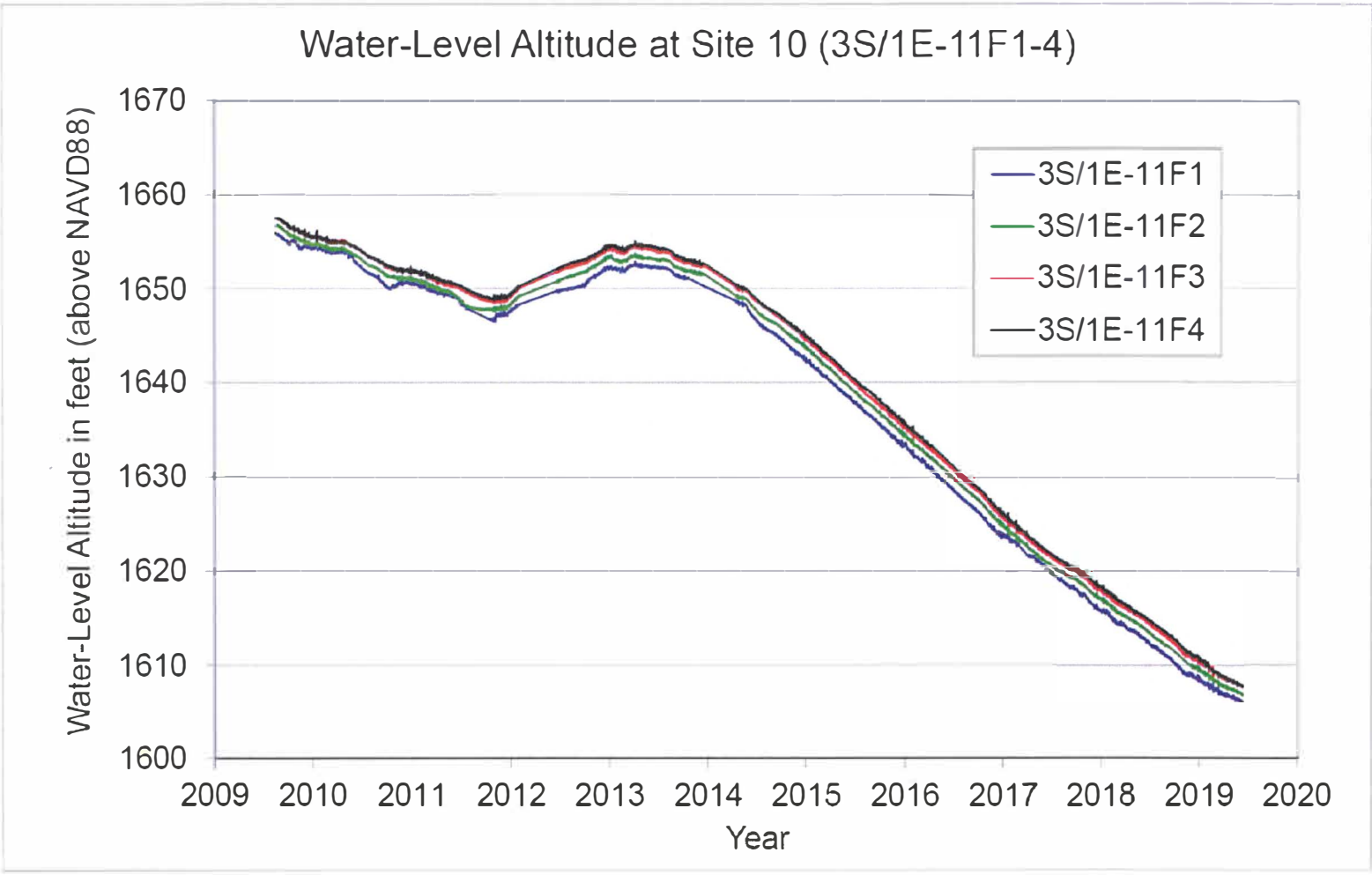



Figure 6. Graph water-level hydrographs for site 10

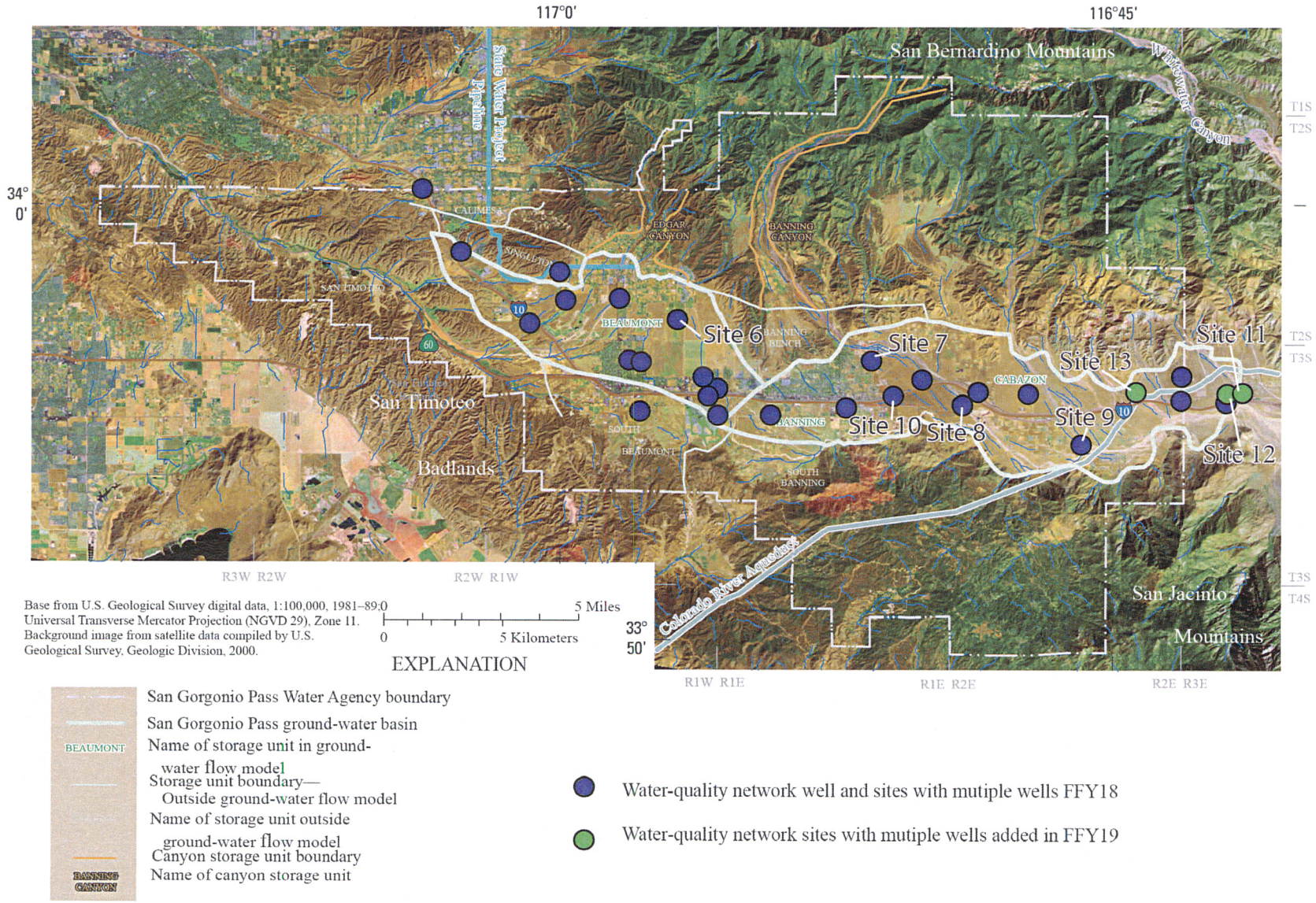



Figure 1. Map showing the water-quality network FFY20