09508500 VERDE RIVER BELOW TANGLE CREEK, ABOVE HORSESHOE DAM, AZ

Verde Basin
Lower Verde Subbasin

LOCATION.--Lat 34°04′23″, long 111°42′56″ referenced to North American Datum of 1927, in sec.35, T.9 N., R.6 E., Yavapai County, AZ, Hydrologic Unit 15060203, in Tonto National Forest, on right bank 1.3 mi downstream from Tangle Creek and 9 mi upstream from Horseshoe Dam.(unsurveyed).

DRAINAGE AREA.--5,858 mi^2, of which 364 mi^2 probably is noncontributing, including 357 mi^2 in aubrey valley playa, a closed basin.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--Aug. 1945 to current year.

REVISED RECORDS.--WDR AZ-89-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,029.0 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 145,000 ft^3/s, Jan. 8, 1993, gage height 23.4 ft, from slope-area measurement of peak flow. Maximum daily discharge, 32600 ft^3/s Jan. 28, 2007; Minimum daily discharge, 61 ft^3/s Aug. 10, 2009.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1888, 150,000 ft^3/s, Feb. 24, 1891, based on comparison with peak discharge at other stations on Verde River.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft^3/s and (or) maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 22	0215	*72,300	*22.55
Mar 8	1320	8,580	13.18
Aug 2	1515	6,830	12.45

Minimum daily discharge, 86 ft^3/s, June 21.

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DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	104	175	212	240	1,580	1,300	3,050	261	137	93	563	160
2	105	176	217	241	1,400	1,490	2,630	258	135	95	2,660	e150
3	106	175	218	239	1,340	1,520	2,190	251	129	96	1,820	145
4	113	174	218	237	1,340	1,830	1,620	239	123	97	829	142
5	117	176	221	237	1,340	2,090	1,540	219	121	101	606	129
6	121	176	231	239	1,400	2,080	1,880	200	118	99	454	e120
7	123	176	252	239	2,000	2,600	2,090	193	112	96	366	e110
8	133	178	411	237	3,610	8,020	1,720	188	107	97	316	e120
9	135	180	311	234	2,370	6,870	1,340	188	105	98	304	133
10	128	181	325	235	1,720	5,000	1,250	174	102	106	382	138
11	125	181	294	236	1,320	3,610	1,330	172	102	110	337	e120
12	130	179	274	236	1,060	3,620	1,250	172	102	116	275	120
13	134	183	264	236	900	3,030	1,210	176	103	119	238	e110
14	140	187	262	236	840	2,840	1,140	176	109	125	209	e105
15	145	189	253	234	901	3,050	1,020	174	108	139	186	e110
16	140	189	251	236	1,080	2,630	895	174	105	135	175	e110
17	140	191	250	240	1,220	2,790	832	169	103	139	214	117
18	143	192	245	244	1,320	3,880	766	166	105	141	183	109
19	142	191	244	261	1,230	4,760	687	165	90	142	179	e105
20	136	193	242	609	1,250	4,700	639	161	88	147	173	107
21	139	195	243	12,600	1,340	3,930	599	154	86	145	167	106
22	142	199	245	30,600	1,460	2,970	535	148	90	138	158	120
23	146	199	248	9,640	2,090	3,250	501	144	e90	218	152	e120
24	148	197	250	4,960	1,360	3,620	501	146	e90	231	163	e125
25	149	198	246	3,060	1,040	2,890	460	151	92	202	161	e130
26	151	199	248	2,140	947	2,640	415	159	91	215	154	e130
27	154	204	245	1,870	1,080	2,710	367	153	88	187	150	e125
28	158	211	245	2,930	1,050	2,460	316	148	e90	264	155	e120
29	164	214	245	2,730	---	2,060	280	147	e90	244	149	118
30	173	214	245	2,200	---	2,090	274	146	93	219	153	114
31	176	---	244	1,830	---	2,410	---	140	---	234	156	---
Total	4,260	5,672	7,899	79,706	39,588	98,740	33,327	5,512	3,104	4,588	12,187	3,668
Mean	137	189	255	2,571	1,414	3,185	1,111	178	103	148	393	122
Max	176	214	411	30,600	3,610	8,020	3,050	261	137	264	2,660	160
Min	104	174	212	234	840	1,300	274	140	86	93	149	105
Ac-ft	8,450	11,250	15,670	158,100	78,520	195,900	66,100	10,930	6,160	9,100	24,170	7,280
Cfsm	0.03	0.03	0.05	0.47	0.26	0.58	0.20	0.03	0.02	0.03	0.07	0.02
In.	0.03	0.04	0.05	0.54	0.27	0.67	0.23	0.04	0.02	0.03	0.08	0.02

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 2010, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	224	355	518	1,352	1,449	1,405	613	176	119	154	264	254
Max	443	1,256	2,097	12,420	8,501	3,776	2,855	289	206	298	1,114	752
(WY)	(2001)	(2005)	(2005)	(1993)	(1993)	(1991)	(1998)	(1998)	(1992)	(1986)	(1992)	(1999)
Min	129	189	231	228	230	193	162	101	63.3	71.4	72.5	118
(WY)	(2004)	(2008)	(2004)	(2004)	(2002)	(2002)	(2002)	(2004)	(2004)	(2003)	(2002)	(2001)

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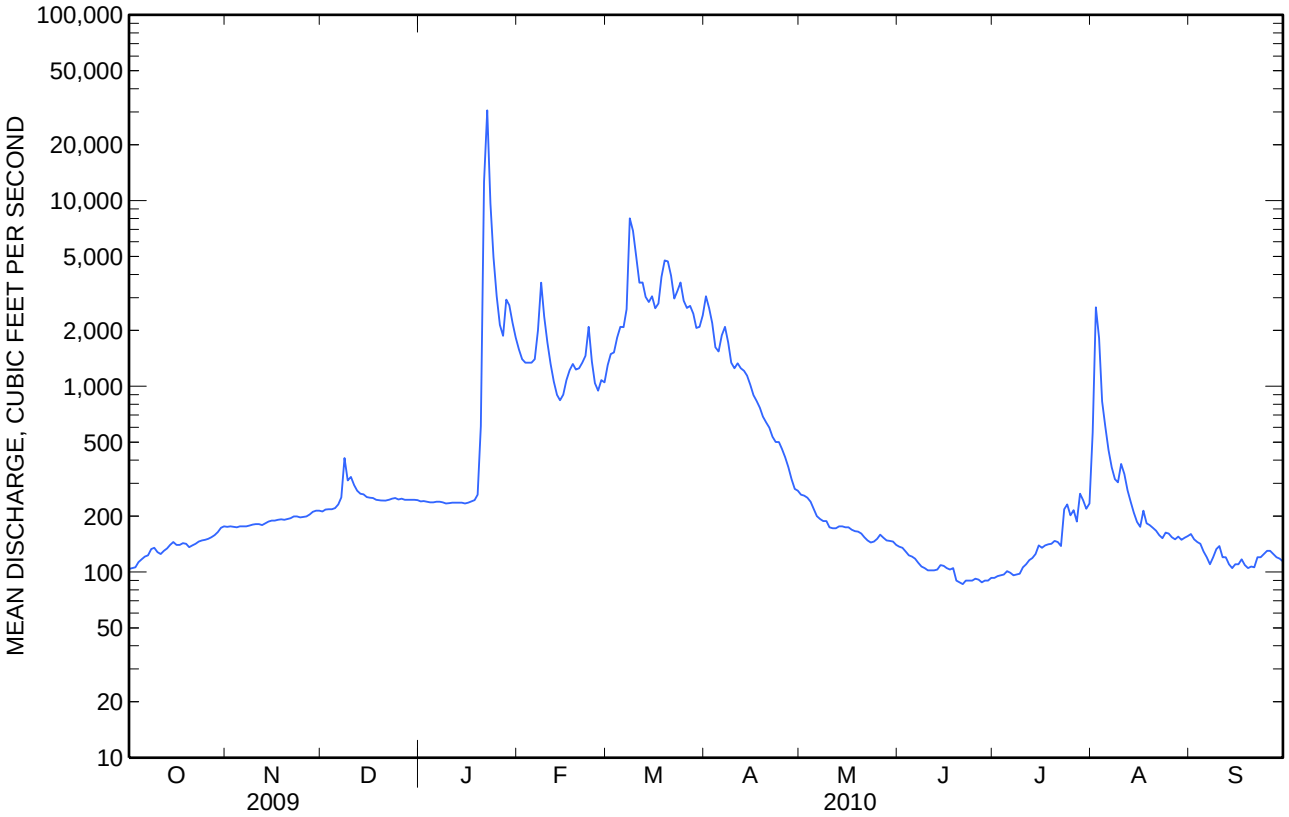
SUMMARY STATISTICS

	Calendar Year 2009		Water Year 2010		Water Years 1986 - 2010	
Annual total	110,792		298,251			
Annual mean	304		817		500	
Highest annual mean					1,609	2005
Lowest annual mean					177	2002
Highest daily mean	4,220	Feb 25	30,600	Jan 22	110,000	Jan 8, 1993
Lowest daily mean	61	Aug 10	86	Jun 21	52	Jun 28, 2007
Annual seven-day minimum	67	Aug 6	89	Jun 19	56	Jul 5, 2004
Annual runoff (ac-ft)	219,800		591,600		362,500	
Annual runoff (cfsm)	0.055		0.149		0.091	
Annual runoff (inches)	0.75		2.02		1.24	
10 percent exceeds	538		2,190		789	
50 percent exceeds	177		202		227	
90 percent exceeds	89		107		110	



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WATER-QUALITY RECORDS

PERIOD OF RECORD.-- Oct. 1980 to current year.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010

Part 1 of 7

[%, percent; CaCO3, calcium carbonate; MF, membrane filter; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; col/100 mL, colonies per 100 milliliters; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated; k, counts outside acceptable range; p, value reported is preferred]

Date	Sample start time	Medium name	Sample type	Barometric pressure, mm Hg (00025)	Temperature, air, °C (00020)	Discharge, instantaneous, ft³/s (00061)	Dissolved oxygen, water, unfiltered, mg/L (00300)	Dissolved oxygen, water, unfiltered, % saturation (00301)	pH, water, unfiltered, field, standard units (00400)	Specific conductance, water, unfiltered, µS/cm at 25 °C (00095)
12-30-2009	1255	Surface water	Regular	718	10.0	245	11.0	99	8.3	624
03-30-2010	1400	Surface water	Regular	706	28.0	1,910	9.6	100	8.3	270
05-26-2010	1320	Surface water	Regular	707	29.0	163	8.2	100	8.5	682
08-31-2010	1400	Surface water	Regular	709	32.0	153	7.6	101	8.4	651

WATER-QUALITY DATA
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010

Part 2 of 7

[%, percent; CaCO3, calcium carbonate; MF, membrane filter; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; col/100 mL, colonies per 100 milliliters; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated; k, counts outside acceptable range; p, value reported is preferred]

Date	Temperature, water, °C (00010)	Turbidity, water, unfiltered, broad band light source (400-680 nm), detectors at multiple angles including 90 +/- 30 degrees, ratiometric correction, NTRU (63676)	Dissolved solids dried at 180 °C, water, filtered, mg/L (70300)	Dissolved solids, water, filtered, sum of constituents, milligrams per liter (70301)	Dissolved solids, water, filtered, tons per acre-foot (70303)	Hardness, water, mg/L as CaCO3 (00900)	Noncarbonate hardness, water, filtered, field, milligrams per liter as calcium carbonate (00904)	Suspended solids, water, unfiltered, mg/L (00530)	Calcium, water, filtered, mg/L (00915)
12-30-2009	7.9	< 2.0	372	338	.51	259	7	< 15	48.2
03-30-2010	13.7	E 13	166	E 136	.23	114	2	16	25.8
05-26-2010	21.3	E 3.5	383	E 379	.52	270	14	< 15	50.8 p
08-31-2010	25.8	E 19	396	E 357	.54	248	6	32	46.9

09508500 VERDE RIVER BELOW TANGLE CREEK, ABOVE HORSESHOE DAM, AZ—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010
Part 3 of 7

[%, percent; CaCO3, calcium carbonate; MF, membrane filter; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; col/100 mL, colonies per 100 milliliters; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated; k, counts outside acceptable range; p, value reported is preferred]

Date	Calcium, water, unfiltered, recoverable, mg/L (00916)	Magnesium, water, filtered, mg/L (00925)	Magnesium, water, unfiltered, recoverable, mg/L (00927)	Potassium, water, filtered, mg/L (00935)	Sodium adsorption ratio, water, number (00931)	Sodium, water, filtered, mg/L (00930)	Alkalinity, water, filtered, inflection-point, incremental titration method, field, mg/L as CaCO3 (39086)	Bicarbonate, water, filtered, inflection-point, incremental titration method, field, mg/L (00453)	Carbonate, water, filtered, inflection-point incremental titration method, field, mg/L (00452)
12-30-2009	45.8	33.6	31.9	2.22	.89	32.9	252	300	3.6
03-30-2010	26.2	12.0	12.0	1.26	.39	9.63	112	131	2.9
05-26-2010	52.9 p	34.6 p	34.5 p	3.04	1.08	40.7	256	290	10.9
08-31-2010	48.2	31.8	33.2	3.20	1.07	38.9	242	278	8.5

WATER-QUALITY DATA
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010
Part 4 of 7

[%, percent; CaCO3, calcium carbonate; MF, membrane filter; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; col/100 mL, colonies per 100 milliliters; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated; k, counts outside acceptable range; p, value reported is preferred]

Date	Chloride, water, filtered, mg/L (00940)	Fluoride, water, filtered, mg/L (00950)	Sulfate, water, filtered, mg/L (00945)	Ammonia plus organic nitrogen, water, unfiltered, mg/L as N (00625)	Ammonia, water, filtered, mg/L as N (00608)	Nitrate plus nitrite, water, filtered, mg/L as N (00631)	Organic nitrogen, water, unfiltered, mg/L (00605)	Phosphorus, water, unfiltered, mg/L as P (00665)	Total nitrogen, water, unfiltered, mg/L (00600)	Escherichia coli, modified m-TEC MF method, water, col/100 mL (90902)
12-30-2009	21.8	.31	47.9	< .10	< .020	< .04	< .10	E .01	< .14	< 1 k
03-30-2010	7.21	.16	12.8	.22	< .020	E .03	< .22	.07	E .26	E 2 k
05-26-2010	27.4	.35	68.7	.14	< .020	< .04	< .14	.03	< .18	E 1 k
08-31-2010	26.5	.32	64.7	.22	< .020	< .04	< .22	.06	< .26	31

09508500 VERDE RIVER BELOW TANGLE CREEK, ABOVE HORSESHOE DAM, AZ—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010

Part 5 of 7

[%, percent; CaCO3, calcium carbonate; MF, membrane filter; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; col/100 mL, colonies per 100 milliliters; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated; k, counts outside acceptable range; p, value reported is preferred]

Date	Barium, water, unfiltered, recoverable, µg/L (01007)	Beryllium, water, filtered, µg/L (01010)	Beryllium, water, unfiltered, recoverable, µg/L (01012)	Cadmium, water, filtered, µg/L (01025)	Cadmium, water, unfiltered, µg/L (01027)	Chromium, water, unfiltered, recoverable, µg/L (01034)	Copper, water, filtered, µg/L (01040)	Copper, water, unfiltered, recoverable, µg/L (01042)	Lead, water, filtered, µg/L (01049)	Lead, water, unfiltered, recoverable, µg/L (01051)
12-30-2009	93.3	< .01	< .04	< .02	E .02	.51	< 1.0	E .75	.05	.06
03-30-2010	53.3	< .01	E .03	E .02	E .04	.97	1.3	2.2	.09	.56
05-26-2010	86.8	< .01	< .04	E .02	< .04	E .36	E .71	E 1.1	< .03	.17
08-31-2010	93.5	< .01	E .04	E .01	< .04	1.1	E .91	2.0	.08	.63

WATER-QUALITY DATA
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010

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[%, percent; CaCO3, calcium carbonate; MF, membrane filter; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; col/100 mL, colonies per 100 milliliters; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated; k, counts outside acceptable range; p, value reported is preferred]

Date	Manganese, water, unfiltered, recoverable, µg/L (01055)	Mercury, water, filtered, µg/L (71890)	Mercury, water, unfiltered, recoverable, µg/L (71900)	Zinc, water, filtered, µg/L (01090)	Zinc, water, unfiltered, recoverable, µg/L (01092)	Antimony, water, filtered, µg/L (01095)	Antimony, water, unfiltered, micrograms per liter (01097)	Arsenic, water, filtered, µg/L (01000)	Arsenic, water, unfiltered, µg/L (01002)	Boron, water, unfiltered, recoverable, micrograms per liter (01022)
12-30-2009	6.4	< .010	< .010	< 2.8	< 2.0	E .05	< .4	19.6	17.9	162
03-30-2010	31.3	< .010	< .010	< 2.8	E 1.7	.11	< .4	8.1	8.2	49
05-26-2010	31.6	< .010	< .010	< 2.8	E 1.3	.08	< .4	19.9	19.9	138
08-31-2010	53.5	< .010	< .010	< 2.8	2.3	.08	< .4	21.9	23.8	193

09508500 VERDE RIVER BELOW TANGLE CREEK, ABOVE HORSESHOE DAM, AZ—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010

Part 7 of 7

[%, percent; CaCO3, calcium carbonate; MF, membrane filter; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; col/100 mL, colonies per 100 milliliters; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated; k, counts outside acceptable range; p, value reported is preferred]

Date	Selenium, water, unfiltered, µg/L (01147)	Suspended sediment concen tration, mg/L (80154)	Suspended sediment discharge, tons per day (80155)
12-30-2009	.70	3	2.0
03-30-2010	.29	21	108
05-26-2010	.65	19	8.4
08-31-2010	.52	30	12