

Water-Data Report 2011

**06308500 TONGUE RIVER AT MILES CITY, MT**

Tongue Basin  
Lower Tongue Subbasin

LOCATION.--Lat 46°23'05", long 105°50'41" referenced to North American Datum of 1927, in SE ¼ SE ¼ SE ¼ sec.4, T.7 N., R.47 E., Custer County, MT, Hydrologic Unit 10090102, on right bank 1.5 mi south of Miles City and at river mile 2.3.

DRAINAGE AREA.--5,397 mi<sup>2</sup>. Area at site used prior to Oct. 4, 1995, 5,379 mi<sup>2</sup>.

**SURFACE-WATER RECORDS**

PERIOD OF RECORD.--April 1938 to April 1942, April 1946 to current year. Published as "near Miles City" April 1938 to April 1942. Not equivalent to records published as "near Miles City" May 1929 to October 1932. April 1946 to Oct. 4, 1995, at site 2.5 mi upstream from present site. Flows at present site are equivalent with flows at site operated from 1946. Monthly discharge only for some periods, published in Water Supply Paper (WSP) 1309.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,360 ft, referenced to the National Geodetic Vertical Datum of 1929. April 1938 to April 1942, nonrecording gage located at site 8 mi upstream from present site at different elevation. April 1946 to Sept. 30, 1963, located at elevation 1.00 ft higher than present site. Oct. 4, 1995, gage was moved 2.5 miles downstream.

REMARKS.--Records are good except estimated daily discharges, which are poor. Flow is regulated by Tongue River Reservoir (station 0630700) with capacity of 79,100 acre-feet, and many small reservoirs in Wyoming with combined capacity about 15,000 acre-ft. Diversions for irrigation include about 100,800 acres upstream from station. U.S. Army Corps of Engineers satellite telemeter is located at the station.

## 06308500 TONGUE RIVER AT MILES CITY, MT—Continued

**DISCHARGE, CUBIC FEET PER SECOND**  
**WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011**  
**DAILY MEAN VALUES**

[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	108	208	e170	e130	e180	e220	425	607	e5,700	3,990	433	254
2	114	208	e170	e140	e170	e210	438	571	e4,600	3,760	420	255
3	123	207	e180	e140	e170	e220	425	543	e4,000	3,610	406	198
4	127	206	e170	e130	e160	e250	413	535	e4,000	3,660	388	208
5	126	206	e170	e140	e160	e240	402	522	e3,700	3,700	343	210
6	127	207	e160	e150	e200	e240	406	517	e3,400	3,450	349	207
7	128	208	e170	e160	e240	e230	409	509	3,100	3,080	350	216
8	128	208	e160	e160	e220	e230	423	508	3,010	2,830	334	212
9	134	208	e160	e160	e210	e230	428	573	3,010	2,600	316	214
10	139	208	e160	e150	e200	e240	443	3,350	3,280	2,460	276	211
11	144	208	e150	e140	e190	e700	442	8,480	3,610	2,340	277	216
12	149	208	e150	e130	e180	e3,500	449	2,650	3,890	2,270	278	195
13	150	210	e160	e140	e220	3,120	450	1,110	4,170	2,240	291	194
14	148	212	e160	e140	e450	1,810	459	824	4,630	2,250	287	208
15	150	218	e170	e130	e550	1,620	471	742	4,610	2,230	282	214
16	153	226	e160	e140	e500	1,560	486	689	4,340	2,150	280	215
17	158	246	e150	e150	e450	1,540	491	684	4,370	2,060	288	229
18	159	235	e150	e160	e400	1,170	504	733	4,970	1,980	282	211
19	144	227	e140	e150	e360	1,060	526	947	4,600	1,800	256	200
20	149	161	e140	e150	e320	889	534	3,620	4,520	1,590	247	226
21	151	e130	e140	e160	e300	718	552	12,000	4,460	1,380	262	234
22	153	e130	e140	e170	e280	607	639	11,500	4,340	1,190	252	235
23	154	e150	e150	e170	e270	567	1,500	7,520	4,080	1,060	238	222
24	155	e170	e150	e170	e260	508	1,460	3,740	3,920	891	221	211
25	160	e160	e140	e170	e250	477	883	3,140	3,690	763	218	205
26	166	e200	e140	e180	e240	456	667	3,130	3,590	624	221	152
27	168	e190	e150	e190	e240	439	614	3,110	3,730	649	228	136
28	173	e180	e140	e200	e230	424	589	3,020	3,860	567	226	138
29	181	e180	e140	e210	---	417	552	3,080	4,000	531	215	141
30	209	e180	e130	e200	---	412	544	4,910	4,090	468	216	147
31	209	---	e120	e190	---	418	---	6,370	---	453	224	---
<b>Total</b>	4,637	5,895	4,740	4,900	7,600	24,722	17,024	90,234	121,270	62,626	8,904	6,114
<b>Mean</b>	150	196	153	158	271	797	567	2,911	4,042	2,020	287	204
<b>Max</b>	209	246	180	210	550	3,500	1,500	12,000	5,700	3,990	433	255
<b>Min</b>	108	130	120	130	160	210	402	508	3,010	453	215	136
<b>Ac-ft</b>	9,200	11,690	9,400	9,720	15,070	49,040	33,770	179,000	240,500	124,200	17,660	12,130

**STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2011, BY WATER YEAR (WY)\***

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	233	246	185	187	263	507	428	721	1,319	481	177	193
<b>Max</b>	694	585	423	529	1,794	1,783	1,693	2,983	4,042	2,207	700	599
<b>(WY)</b>	(1972)	(1942)	(1950)	(1999)	(1971)	(1971)	(1965)	(1978)	(2011)	(1975)	(1975)	(1968)
<b>Min</b>	10.3	60.9	68.0	65.3	74.5	74.5	12.5	29.2	41.9	12.6	6.08	2.40
<b>(WY)</b>	(1961)	(1989)	(1990)	(2005)	(2003)	(2002)	(1961)	(1961)	(2002)	(1960)	(1949)	(1938)

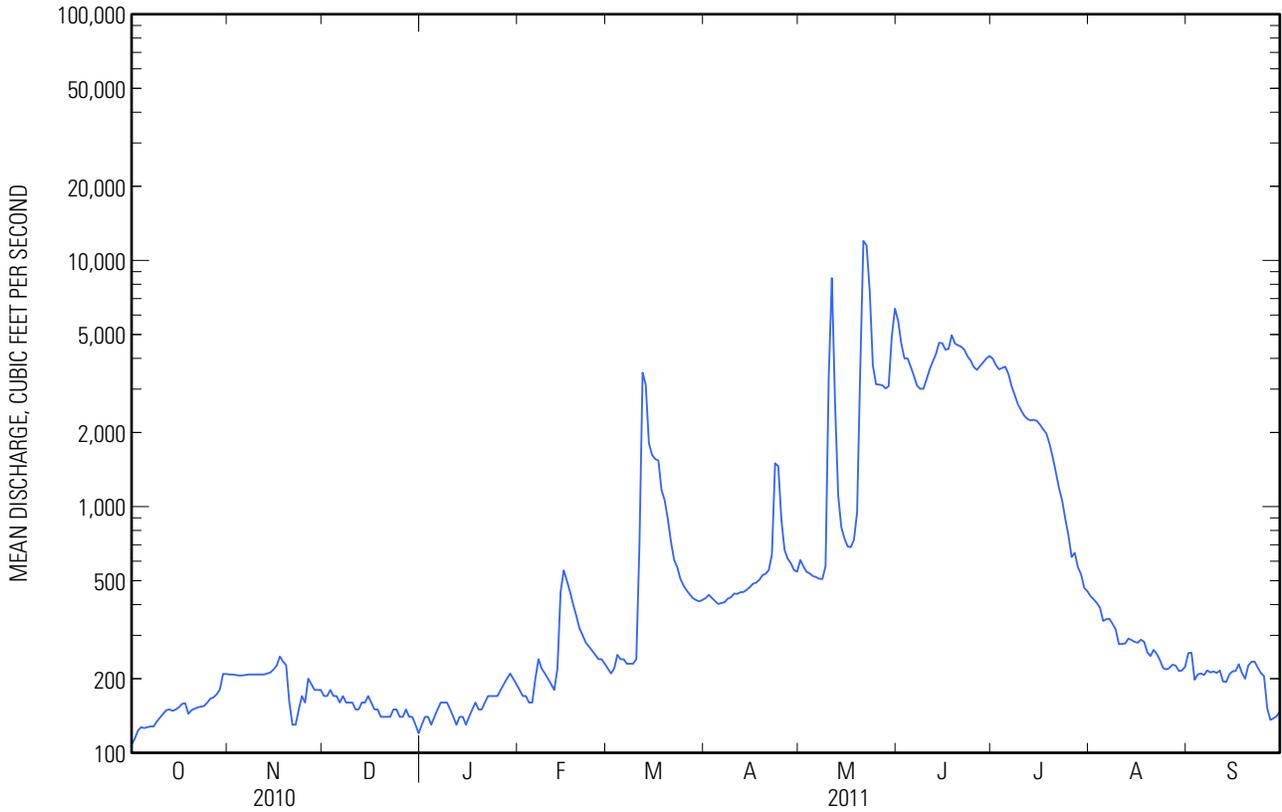
\*During periods of operation (April 1938 to April 1942, April 1946 to current year).

06308500 TONGUE RIVER AT MILES CITY, MT—Continued

SUMMARY STATISTICS

	Calendar Year 2010		Water Year 2011		Water Years 1938 – 2011*	
<b>Annual total</b>	164,827		358,666			
<b>Annual mean</b>	452		983		409	
<b>Highest annual mean</b>					986	1978
<b>Lowest annual mean</b>					57.2	1961
<b>Highest daily mean</b>	4,010	May 25	12,000	May 21	12,000	May 21, 2011
<b>Lowest daily mean</b>	96	Aug 27	108	Oct 1	0.00	Jul 9, 1940
<b>Annual seven-day minimum</b>	108	Aug 22	122	Oct 1	0.00	Jul 9, 1940
<b>Maximum peak flow</b>			15,300	May 21	15,300	May 21, 2011
<b>Maximum peak stage</b>			13.99	May 21	13.99	May 21, 2011
<b>Annual runoff (ac-ft)</b>	326,900		711,400		296,300	
<b>10 percent exceeds</b>	1,450		3,610		918	
<b>50 percent exceeds</b>	170		240		218	
<b>90 percent exceeds</b>	129		143		67	

\*During periods of operation (April 1938 to April 1942, April 1946 to current year).



**06308500 TONGUE RIVER AT MILES CITY, MT—Continued**

**WATER-QUALITY RECORDS**

PERIOD OF RECORD.--Water years 1946 to September 1994, October 1977 to December 1985, May 1999 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1965 to September 1981 (observer), April 29, 2004 to current year (seasonal records, continuous monitor).

WATER TEMPERATURE: April 2000 to September 2003 (seasonal records).

SUSPENDED-SEDIMENT DISCHARGE: October 1977 to December 1985.

INSTRUMENTATION.--Specific conductance probe was installed April 28, 2004.

REMARKS.--Daily specific conductance records are provided for the months of the water year during which irrigation occurs (October 2010, April 1 to Sept. 30, 2011). Due to the inability to perform regular maintenance and calibration on the monitor due to high flows and the high amounts of sediment deposited during the high flows, along with a lapse in funding, the accuracy of the specific conductance record is downgraded to fair during the period of record.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (seasonal records): Maximum daily, 1,640 microsiemens per centimeter ( $\mu\text{S}/\text{cm}$ ) at 25.0°C, April 9, 2011; minimum daily, 215  $\mu\text{S}/\text{cm}$  at 25.0°C, Feb. 16, 1971.

WATER TEMPERATURE (seasonal records): Maximum, 37.0°C, Aug. 22, 2001; minimum 0.0°C, Apr. 5, 2002.

SEDIMENT CONCENTRATION: Maximum daily mean, 14,200 mg/L, Aug. 3, 1985; minimum daily mean, 3 mg/L, Dec. 20, 1983.

SEDIMENT LOAD: Maximum daily, 84,400 tons May 18, 1978; minimum daily, 0.13 tons May 5, 1981.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE (seasonal records): Maximum, 1,900  $\mu\text{S}/\text{cm}$  at 25.0°C, April 22; minimum, 412  $\mu\text{S}/\text{cm}$  at 25.0°C, July 14.

## 06308500 TONGUE RIVER AT MILES CITY, MT—Continued

**SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS  
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011**

[Remark codes: #, Value computed from partial day with greater than 50% of the day recorded; \*, Computed from available daily values. A specific conductance value greater or less than the reported maximum or minimum may have occurred during the missing period of record.]

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
	October			November			December			January		
1	820	812	816	---	---	---	---	---	---	---	---	---
2	822	817	820	---	---	---	---	---	---	---	---	---
3	819	815	818	---	---	---	---	---	---	---	---	---
4	817	811	815	---	---	---	---	---	---	---	---	---
5	815	810	812	---	---	---	---	---	---	---	---	---
6	812	805	808	---	---	---	---	---	---	---	---	---
7	808	804	806	---	---	---	---	---	---	---	---	---
8	810	805	807	---	---	---	---	---	---	---	---	---
9	846	803	821	---	---	---	---	---	---	---	---	---
10	836	811	827	---	---	---	---	---	---	---	---	---
11	812	807	810	---	---	---	---	---	---	---	---	---
12	807	799	804	---	---	---	---	---	---	---	---	---
13	800	796	798	---	---	---	---	---	---	---	---	---
14	802	797	800	---	---	---	---	---	---	---	---	---
15	811	802	806	---	---	---	---	---	---	---	---	---
16	814	810	812	---	---	---	---	---	---	---	---	---
17	810	806	809	---	---	---	---	---	---	---	---	---
18	814	809	810	---	---	---	---	---	---	---	---	---
19	821	814	819	---	---	---	---	---	---	---	---	---
20	818	810	814	---	---	---	---	---	---	---	---	---
21	811	807	809	---	---	---	---	---	---	---	---	---
22	807	805	806	---	---	---	---	---	---	---	---	---
23	807	805	806	---	---	---	---	---	---	---	---	---
24	806	804	805	---	---	---	---	---	---	---	---	---
25	804	799	800	---	---	---	---	---	---	---	---	---
26	805	800	802	---	---	---	---	---	---	---	---	---
27	806	801	804	---	---	---	---	---	---	---	---	---
28	807	801	803	---	---	---	---	---	---	---	---	---
29	804	795	800	---	---	---	---	---	---	---	---	---
30	849	784	796	---	---	---	---	---	---	---	---	---
31	856	792	814	---	---	---	---	---	---	---	---	---
Month	856	784	809	---	---	---	---	---	---	---	---	---

## 06308500 TONGUE RIVER AT MILES CITY, MT—Continued

**SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS  
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[Remark codes: #, Value computed from partial day with greater than 50% of the day recorded; \*, Computed from available daily values. A specific conductance value greater or less than the reported maximum or minimum may have occurred during the missing period of record.]

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
	February			March			April			May		
1	---	---	---	---	---	---	1,520	1,470	1,490	1,350	1,060	1,190
2	---	---	---	---	---	---	1,610	1,500	1,570	1,310	1,080	1,140
3	---	---	---	---	---	---	1,610	1,510	1,560	1,100	1,070	1,090
4	---	---	---	---	---	---	1,520	1,490	1,500	1,140	1,090	1,110
5	---	---	---	---	---	---	1,570	1,500	1,530	1,140	1,130	1,140
6	---	---	---	---	---	---	1,610	1,570	1,600	1,180	1,140	1,150
7	---	---	---	---	---	---	1,620	1,610	1,610	1,140	1,130	1,140
8	---	---	---	---	---	---	1,610	1,600	1,600	1,130	1,080	1,110
9	---	---	---	---	---	---	1,690	1,600	1,640	1,210	1,060	1,090
10	---	---	---	---	---	---	1,610	1,510	1,570	1,110	490	812
11	---	---	---	---	---	---	1,540	1,500	1,530	573	450	484
12	---	---	---	---	---	---	1,530	1,490	1,510	846	573	733
13	---	---	---	---	---	---	1,490	1,470	1,480	1,070	846	968
14	---	---	---	---	---	---	1,470	1,450	1,460	1,180	1,060	1,120
15	---	---	---	---	---	---	1,460	1,420	1,440	1,220	1,180	1,200
16	---	---	---	---	---	---	1,430	1,390	1,410	1,220	1,190	1,200
17	---	---	---	---	---	---	1,390	1,360	1,380	1,200	1,180	1,190
18	---	---	---	---	---	---	1,360	1,340	1,350	1,370	1,180	1,210
19	---	---	---	---	---	---	1,340	1,300	1,320	1,590	1,130	1,330
20	---	---	---	---	---	---	1,400	1,300	1,310	1,140	587	927
21	---	---	---	---	---	---	1,400	1,310	1,350	666	505	557
22	---	---	---	---	---	---	1,900	1,250	1,610	671	620	649
23	---	---	---	---	---	---	1,260	782	1,070	901	664	802
24	---	---	---	---	---	---	840	752	789	1,120	901	1,020
25	---	---	---	---	---	---	1,010	835	907	1,270	1,120	1,180
26	---	---	---	---	---	---	1,130	1,010	1,070	1,250	1,180	1,210
27	---	---	---	---	---	---	1,150	1,100	1,120	1,190	1,150	1,170
28	---	---	---	---	---	---	1,140	1,100	1,110	1,220	1,120	1,180
29	---	---	---	---	---	---	1,100	1,080	1,090	1,140	1,100	1,110
30	---	---	---	---	---	---	1,080	1,060	1,070	1,110	846	1,010
31	---	---	---	---	---	---	---	---	---	1,050	828	887
Month	---	---	---	---	---	---	1,900	752	1,370	1,590	450	1,040

## 06308500 TONGUE RIVER AT MILES CITY, MT—Continued

**SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS  
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011**

[Remark codes: #, Value computed from partial day with greater than 50% of the day recorded; \*, Computed from available daily values. A specific conductance value greater or less than the reported maximum or minimum may have occurred during the missing period of record.]

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
	June			July			August			September		
1	1,090	1,040	1,060	523	476	499	805	785	799	892	846	872
2	1,090	1,020	1,060	528	512	521	811	799	803	846	835	839
3	1,060	997	1,030	515	474	500	810	802	806	898	841	873
4	997	921	952	505	457	489	815	795	802	887	871	876
5	921	889	904	483	467	473	849	815	827	884	868	875
6	909	884	892	485	465	476	873	848	865	889	870	879
7	895	872	883	526	485	507	888	862	868	879	865	872
8	894	837	863	571	494	516	897	887	893	878	867	872
9	838	803	819	502	495	499	894	882	887	877	866	870
10	840	798	805	506	486	499	937	893	920	876	865	870
11	847	814	829	486	449	469	938	931	935	873	861	868
12	815	780	792	452	437	445	934	919	925	884	865	873
13	794	785	789	438	429	435	924	902	915	893	884	888
14	837	780	805	429	412	423	906	892	901	906	887	895
15	811	710	779	458	423	433	902	888	897	910	888	900
16	712	677	699	429	423	426	903	887	898	909	887	901
17	722	651	672	431	424	428	888	867	878	901	879	888
18	805	706	764	434	424	429	871	865	868	887	876	881
19	734	668	708	453	434	443	884	865	874	901	886	893
20	672	635	656	470	452	459	903	869	888	910	894	903
21	636	602	617	492	470	483	892	867	880	906	893	900
22	604	576	585	519	490	507	883	852	871	911	905	907
23	583	554	572	555	519	537	884	877	882	913	894	905
24	584	549	564	586	555	570	891	882	887	922	912	918
25	574	518	545	623	585	603	901	882	893	935	921	928
26	518	480	495	782	621	663	907	893	900	999	932	955
27	#509	#482	#488	1,600	782	1,200	894	867	879	1,010	998	1,000
28	#587	#559	#573	911	777	799	880	871	874	1,000	992	997
29	559	529	540	788	771	780	878	870	874	1,000	986	993
30	554	510	536	782	771	775	893	870	880	988	964	976
31	---	---	---	799	780	789	886	866	877	---	---	---
<b>Month</b>	*1,090	*480	*743	1,600	412	551	938	785	876	1,010	835	902