12323710 WILLOW CREEK NEAR ANACONDA, MT

Pend Oreille Basin
Upper Clark Fork Subbasin

LOCATION.--Lat 46°03′53″, long 112°53′34″ referenced to North American Datum of 1927, in SE ¼ SE ¼ SW ¼ sec.30, T.4 N., R.10 W., Deer Lodge County, MT, Hydrologic Unit 17010201, on left bank 1.2 mi downstream from Long Canyon Creek, 4.5 mi southeast of Anaconda, and at river mile 6.5.

DRAINAGE AREA.--13.7 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--April 2005 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 5,310 ft, referenced to the National Geodetic Vertical Datum of 1929.

REMARKS.--Records are good except those for Mar. 30 to Apr. 11, which are fair. No regulation or diversion occurs upstream from station. U.S. Geological Survey satellite telemeter is located at the station.

12323710 WILLOW CREEK NEAR ANACONDA, MT—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1.5	1.9	1.2	1.4	1.3	e1.4	2.9	23	12	5.8	2.1	1.2
2	2.1	2.0	1.3	1.4	1.3	e1.4	2.3	20	12	5.3	1.9	1.2
3	1.8	1.8	1.3	e1.3	1.3	e1.4	2.4	19	11	5.7	1.9	1.1
4	1.9	1.6	1.2	e1.4	1.2	e1.4	3.3	18	11	5.3	1.8	1.0
5	1.8	1.5	1.3	e1.4	1.2	e1.4	6.1	17	10	5.1	1.8	0.99
6	1.7	1.6	1.2	1.4	1.3	e1.5	11	17	9.7	5.1	1.7	0.99
7	1.7	1.6	e1.2	1.3	1.3	e1.4	10	18	9.7	4.8	1.6	0.99
8	1.7	1.6	e1.2	e1.3	1.3	e1.3	9.7	18	12	4.3	1.7	1.00
9	1.7	1.2	e1.2	e1.4	1.2	e1.3	9.8	18	11	4.5	1.8	1.1
10	1.7	1.6	1.3	e1.6	e1.2	e1.2	10	17	14	4.4	1.7	1.1
11	1.6	1.7	1.2	e1.6	e1.2	e1.2	9.0	17	12	4.1	1.5	1.0
12	1.7	1.6	1.2	e1.5	e1.2	e1.3	9.2	17	11	4.1	1.6	0.97
13	1.5	1.3	1.2	e1.3	e1.3	e1.3	12	18	10	4.0	1.6	0.96
14	1.5	1.5	1.2	e1.2	e1.2	e1.3	13	18	9.8	3.7	1.5	1.2
15	1.5	e1.2	1.3	1.3	e1.2	1.4	15	19	9.5	3.5	1.5	1.8
16	1.4	1.6	1.3	e1.3	e1.1	e1.4	17	22	9.0	3.4	1.6	2.2
17	1.4	1.5	e1.3	e1.3	e1.0	e1.4	15	27	8.8	3.2	2.0	1.8
18	1.4	1.4	e1.2	e1.2	e1.0	1.4	13	29	8.1	3.1	1.8	1.5
19	1.4	1.4	e1.2	1.2	e1.1	1.4	11	30	8.5	2.9	1.5	1.4
20	1.4	1.4	e1.3	1.2	e1.2	1.4	11	30	7.7	2.8	1.3	1.5
21	1.4	1.4	1.4	1.2	e1.3	e1.4	12	27	7.3	2.9	1.2	1.9
22	1.4	1.4	e1.5	1.2	e1.4	1.3	15	24	7.0	2.8	1.1	2.1
23	1.4	e1.3	e1.6	1.3	e1.5	1.4	18	22	6.6	2.7	1.1	1.9
24	1.4	e1.3	1.5	1.2	1.5	1.6	16	19	6.4	2.7	1.1	1.6
25	1.4	1.3	1.4	1.2	1.3	1.8	15	18	6.3	2.6	1.4	1.5
26	1.3	1.4	1.4	1.2	1.3	2.1	15	17	6.2	2.5	1.4	1.4
27	1.4	e1.2	e1.2	1.2	e1.6	e1.8	15	18	6.2	2.3	1.2	1.3
28	1.5	e1.2	e1.3	1.3	e1.5	1.8	16	18	6.0	2.1	1.1	1.3
29	1.5	e1.2	e1.3	1.3	---	2.1	18	16	5.9	2.0	1.0	1.3
30	1.4	1.2	e1.4	1.4	---	2.8	22	14	6.8	2.0	1.1	1.3
31	1.5	---	1.6	1.3	---	2.9	---	13	---	2.1	1.2	---
Total	48.0	43.9	40.4	40.8	35.5	48.2	354.7	618	271.5	111.8	46.8	40.60
Mean	1.55	1.46	1.30	1.32	1.27	1.55	11.8	19.9	9.05	3.61	1.51	1.35
Max	2.1	2.0	1.6	1.6	1.6	2.9	22	30	14	5.8	2.1	2.2
Min	1.3	1.2	1.2	1.2	1.0	1.2	2.3	13	5.9	2.0	1.0	0.96
Ac-ft	95	87	80	81	70	96	704	1,230	539	222	93	81

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2005 - 2006, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	1.55	1.46	1.30	1.32	1.27	1.55	7.66	25.4	12.3	4.08	1.72	1.44
Max	1.55	1.46	1.30	1.32	1.27	1.55	11.8	30.8	15.6	4.55	1.94	1.53
(WY)	(2006)	(2006)	(2006)	(2006)	(2006)	(2006)	(2006)	(2005)	(2005)	(2005)	(2005)	(2005)
Min	1.55	1.46	1.30	1.32	1.27	1.55	3.50	19.9	9.05	3.61	1.51	1.35
(WY)	(2006)	(2006)	(2006)	(2006)	(2006)	(2006)	(2005)	(2006)	(2006)	(2006)	(2006)	(2006)

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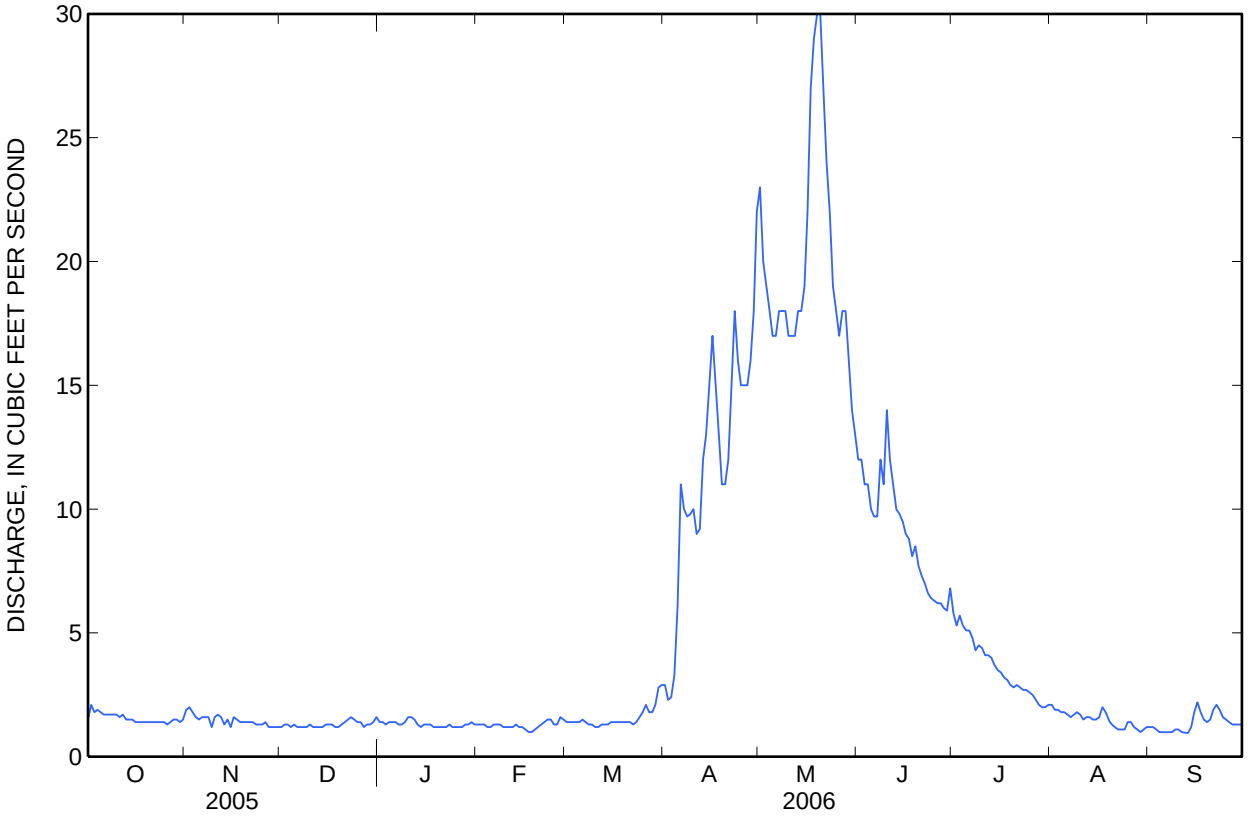
SUMMARY STATISTICS

	Water Year 2006		Water Years 2005 - 2006	
Annual total	1,700.20			
Annual mean	4.66		4.66	
Highest annual mean			4.66	2006
Lowest annual mean			4.66	2006
Highest daily mean	30	May 19	68	May 11, 2005
Lowest daily mean	0.96	Sep 13	0.96	Sep 13, 2006
Annual seven-day minimum	1.0	Sep 7	1.0	Sep 7, 2006
Maximum peak flow	[a]32	May 19	95	May 10, 2005
Maximum peak stage	[b]2.13	Mar 13	2.86	May 10, 2005
Instantaneous low flow	[c]0.60	Oct 25	[c]0.60	Oct 25, 2005
Annual runoff (ac-ft)	3,370		3,370	
10 percent exceeds	15		15	
50 percent exceeds	1.5		1.5	
90 percent exceeds	1.2		1.2	

[a] Gage height, 2.10 ft.
[b] Result of backwater from ice.
[c] Gage height, 1.20 ft.



WATER-QUALITY RECORDS

PERIOD OF RECORD.--December 2004 to current year.

PERIOD OF DAILY RECORD.--
TURBIDITY: Seasonal records, June to September 2006.

INSTRUMENTATION.--Turbidity monitor installed June 2006.

REMARKS.--No chemical water-quality sample collected in March due to unsafe snow conditions preventing access to the site. Daily turbidity records are rated good to excellent. Missing daily turbidity values for June 9-15, 18, and 30; July 11; and Sept. 6, 12, 13, and 22-25 are due to equipment problems. Several unpublished observations of specific conductance and water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--
TURBIDITY: Seasonal records, maximum, 10 formazin nephelometric units (fnu), July 1, 2006; minimum, 1.0 fnu, many days June through September 2006.

EXTREMES FOR PERIOD OF DAILY RECORD.--
TURBIDITY: During seasonal operation, June to September, maximum, 10 formazin nephelometric units (fnu), July 1; minimum, 1.0 fnu, many days June through September.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
Part 1 of 3

Date	Time	Instantaneous discharge, cfs (00061)	Turbdty white light, det ang 90+/-30 corrctd NTRU (63676)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
Oct												
17...	1200	1.4	E.8	7.7	115	15.5	6.0	41	13.7	1.63	16.5	17.7
Apr												
17...	1315	15	12	7.6	93	6.0	3.5	33	11.2	1.25	19.2	20.5
May												
08...	1135	18	5.8	7.7	73	9.5	4.5	26	8.85	.987	14.7	15.6
22...	1215	25	7.1	7.7	66	23.0	8.0	22	7.56	.777	14.1	14.6
Jun												
09...	0735	10	2.5	7.8	92	10.0	7.5	34	11.8	1.18	13.3	13.9
Jul												
24...	1145	3.0	2.1	7.6	109	28.0	15.0	39	13.3	1.40	24.4	25.0
Aug												
23...	1235	1.3	2.1	7.7	111	29.5	13.0	39	13.2	1.48	24.9	25.9

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WATER-QUALITY DATA
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
Part 2 of 3
[Remark codes: <, less than; E, estimated.]

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover -able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover -able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover -able, ug/L (01051)	Mangan- ese, water, fltrd, ug/L (01056)	Mangan- ese, water, unfltrd recover -able, ug/L (01055)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover -able, ug/L (01092)
Oct												
17...	.04	.04	1.6	2.1	74	145	.11	.20	10.2	22.4	1.2	E2
Apr												
17...	E.04	.06	3.9	5.0	154	474	.30	.94	13.4	27.3	2.6	4
May												
08...	<.04	.04	2.6	3.7	67	337	.12	.67	8.1	15.2	1.9	3
22...	<.04	.08	2.3	4.1	43	401	.13	1.25	8.2	21.7	1.7	4
Jun												
09...	E.03	.05	2.0	2.8	52	168	.12	.41	14.8	19.9	1.9	E2
Jul												
24...	.05	.05	1.4	16.8	80	190	.15	.43	20.7	33.8	1.2	E2
Aug												
23...	E.02	E.04	1.3	1.9	116	226	.14	.37	34.5	45.2	1.7	E1

WATER-QUALITY DATA
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
Part 3 of 3

Date	Suspnd. sedi- ment, sieve diametr percent <.063mm (70331)	Sus- pended sedi- ment concen- tration mg/L (80154)	Sus- pended sedi- ment dis- charge, tons/d (80155)
Oct			
17...	72	3	.01
Apr			
17...	78	12	.49
May			
08...	72	8	.39
22...	76	20	1.4
Jun			
09...	82	5	.14
Jul			
24...	91	4	.03
Aug			
23...	61	4	.01

12323710 WILLOW CREEK NEAR ANACONDA, MT—Continued

FROM THE DCP
TURBIDITY, WATER, MONOCHROME NEAR INFRA-RED LED LIGHT, 780-900 NM, DETECTION ANGLE 90 +/ -2.5 DEGREES, FNU
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		June			July			August			September	
1				10	5.0	6.5	4.0	1.5	2.0	6.0	1.5	2.0
2				8.0	3.5	5.0	5.5	1.5	2.0	6.0	1.0	2.0
3				6.5	3.0	4.0	4.5	1.5	2.0	4.5	1.0	1.5
4				9.5	4.0	4.0	5.0	1.0	2.5	4.0	1.0	2.0
5				9.5	3.0	4.5	6.0	1.5	2.5	3.5	1.0	2.0
6				8.5	2.5	3.5	6.5	1.5	3.0	---	---	---
7				5.5	2.0	3.0	5.5	1.5	2.5	2.0	1.0	1.5
8				7.5	2.0	3.0	5.5	1.5	2.5	3.5	1.0	1.5
9	---	---	---	4.5	2.0	2.5	6.5	2.0	3.5	3.5	1.0	2.0
10	---	---	---	4.0	2.0	2.5	6.0	1.5	3.0	4.5	1.0	1.5
11	---	---	---	---	---	---	7.0	1.5	3.0	2.5	1.0	2.0
12	---	---	---	7.0	2.0	2.5	6.5	1.5	2.5	---	---	---
13	---	---	---	4.5	1.5	2.5	6.0	2.0	3.0	---	---	---
14	---	---	---	4.5	1.5	2.0	6.5	2.0	3.0	9.0	1.5	3.0
15	---	---	---	2.5	1.5	2.0	7.0	2.0	3.0	9.0	1.5	3.5
16	5.0	2.0	2.5	4.0	1.5	2.0	7.0	2.0	3.5	5.5	1.5	3.0
17	5.5	1.5	2.5	5.0	1.5	2.0	5.5	1.5	3.0	4.0	1.5	2.5
18	---	---	---	3.0	1.5	2.0	6.0	1.5	2.5	2.5	1.0	1.5
19	3.0	2.0	2.0	3.5	1.5	2.0	3.5	1.5	2.0	3.5	1.5	2.0
20	4.0	1.5	2.0	3.5	1.0	2.0	4.5	1.0	2.0	4.5	1.5	2.0
21	3.5	1.5	2.0	4.0	1.5	2.0	3.0	1.5	1.5	7.0	2.5	3.5
22	5.0	1.5	2.5	5.0	1.0	2.0	4.0	1.5	2.0	---	---	---
23	5.5	1.5	2.5	6.0	1.0	2.0	3.0	1.0	1.5	---	---	---
24	5.0	1.5	2.5	4.0	1.0	2.0	3.0	1.5	2.0	---	---	---
25	5.0	1.5	2.0	6.5	1.0	2.0	4.0	1.5	2.5	---	---	---
26	4.0	1.0	2.0	3.0	1.0	1.5	4.0	1.5	2.0	2.0	1.5	1.5
27	2.5	1.5	2.0	4.0	1.0	2.0	3.0	1.5	1.5	4.5	1.5	2.0
28	5.0	1.0	2.0	6.5	1.5	2.0	4.5	1.0	2.0	3.5	1.5	2.0
29	3.5	1.0	1.5	4.0	1.0	2.0	2.0	1.5	1.5	4.0	1.5	1.5
30	---	---	---	5.0	1.0	2.0	3.0	1.0	1.5	4.0	1.5	2.0
31	---	---	---	3.5	1.5	2.0	3.5	1.0	2.0	---	---	---
Month	---	---	---	---	---	---	7.0	1.0	2.4	---	---	---