

MINUTES OF THE SENATE NATURAL RESOURCES COMMITTEE.

The meeting was called to order by Chairman Senator Robert Tyson at 8:33 a.m. on February 6, 2003 in Room 423-S of the Capitol.

Members present: Senator Tyson, Senator Downey, Senator Lee, Senator Taddiken, Senator Huelskamp, Senator Corbin, Senator Umbarger

Committee staff present: Raney Gilliland, Legislative Research
Lisa Montgomery, Revisor of Statutes
Shannon Stone, Secretary

Conferees appearing before the committee:

Walt Aucott, District Chief, United States Geological Survey
Charlie Perry, Hydrologist, United States Geological Survey

Others attending: Please see the attached list.

The Chair opened the meeting by welcoming guests and members of the United States Geological Survey.

USGS Report on Median Stream Flows as related to Implementation of SB 204

Mr. Walt Aucott (District Chief, United States Geological Survey) introduced to the Committee, Charlie Perry, a hydrologist and senior author of "Estimates of Median Flows of Streams on the Kansas Surface Water Register. A book containing the report was made available for Committee members and staff. A copy of this book is filed in Senator Tyson's office. Mr. Perry briefed the Committee on the results of this study. Streamflow information from the most recent 10 years of record was used as required by KSA 82a-2001 et. seq. The report found that thirty percent of the stream segments of the Kansas Surface Water Register have less than 1 cubic flow per second (CFS) at their downstream end (KSA). USGS also analyzed median flows in Kansas streams using all-available hydrologic information. Using all-available hydrologic information, forty percent of the stream segments of the Kansas Surface Water Register have less than 1 CFS median flow at their downstream end (AAH). (Attachment 1 and 2)

It was noted by staff that only ten percent of stream segments have gauging stations. A news release regarding the report and a handout containing Report corrections was given to Committee members. (Attachments 3 and 4)

Discussion on reach files, trends on peakflow, and study approach followed oral testimony.

Chairman Tyson and Senator Lee congratulated USGS on the comprehensive study. Vice Chairman Senator Taddiken thanked conferees for bringing the Committee up to date.

Adjournment

The meeting was adjourned at 9:16 a.m.

SENATE NATURAL RESOURCES COMMITTEE

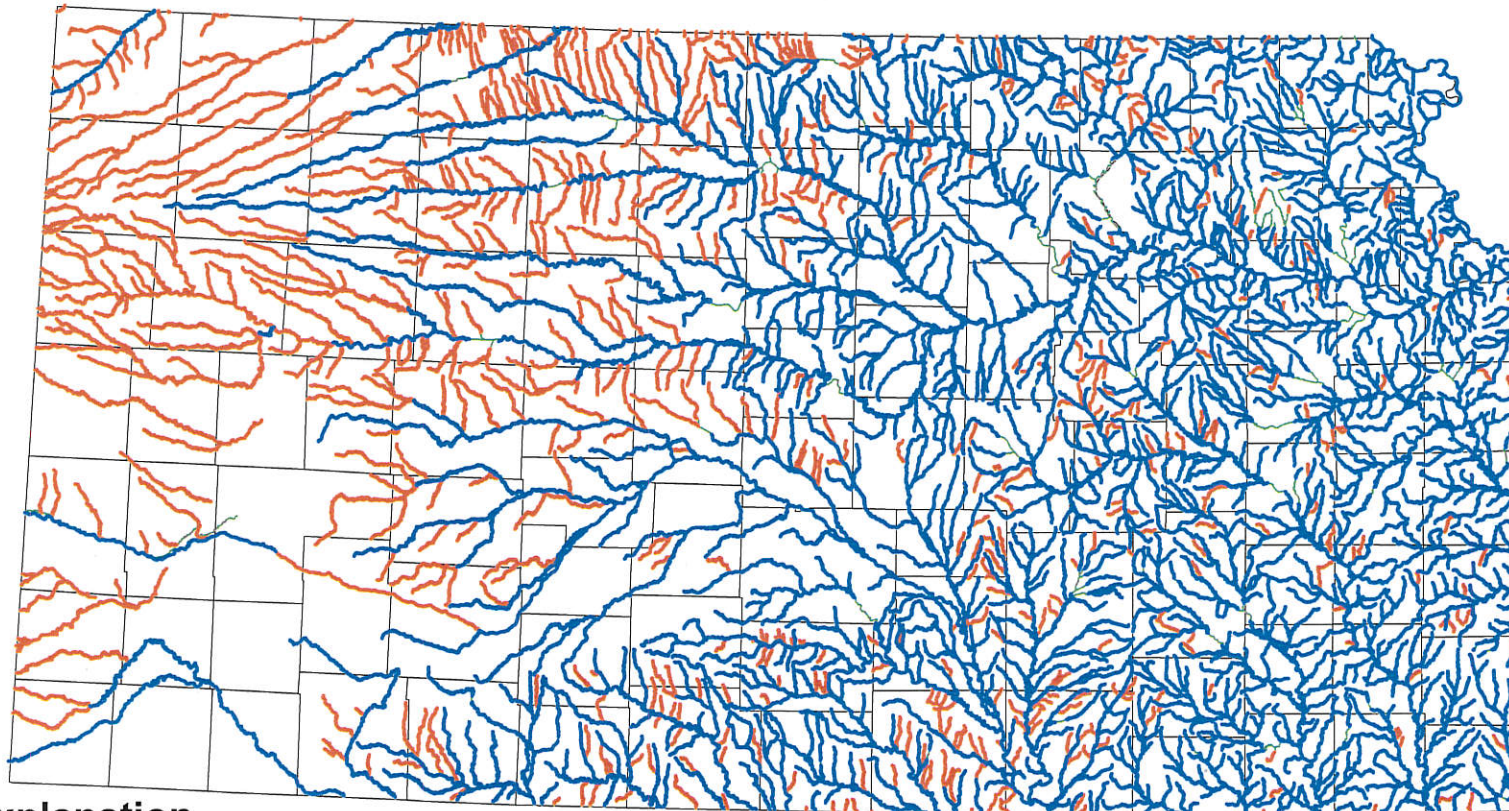
GUEST LIST

DATE: ~~Shannon Star~~
Feb. 6, 2003

NAME	REPRESENTING
Kevin Baeve	Herr Law Firm
Tom Stokes	KDHE
Jim Triplett	Basin Advisory Comm.
Karl Mueldeyer	KDHE
Margaret Fast	KWOO
Charles Perry	USGS
WALT ALCOTT	USGS
BEN HOPPER	KS DAZEN ASSOC.
Mike Beam	KS. LUSTK. ASSN.
Dusty Buehl	Bottenberg & Assoc.
Steve Swaffar	KS Farm Bureau
MIKE TATE	KDHE
Theresa Hodges	KDHE
David Woluck	USGS
Greg Krussek	KS Corn Growers Assoc
Blake Kerns	Inter for Sen. Schmidt
Graet Rothschild	Lawrence Journal-World

USGS

Median streamflows Using KSA 82a-2001 Criterion
(Last 10 years of streamflow data at sites with at least 10 years of record)



Explanation

- KSA Median flow ≥ 1 CFS
- KSA Median flow < 1 CFS
- Unclassified stream segment
- County boundary

30 % of the stream segments of the Kansas Surface Water Register have less than 1 CFS median flow at their downstream end (KSA)

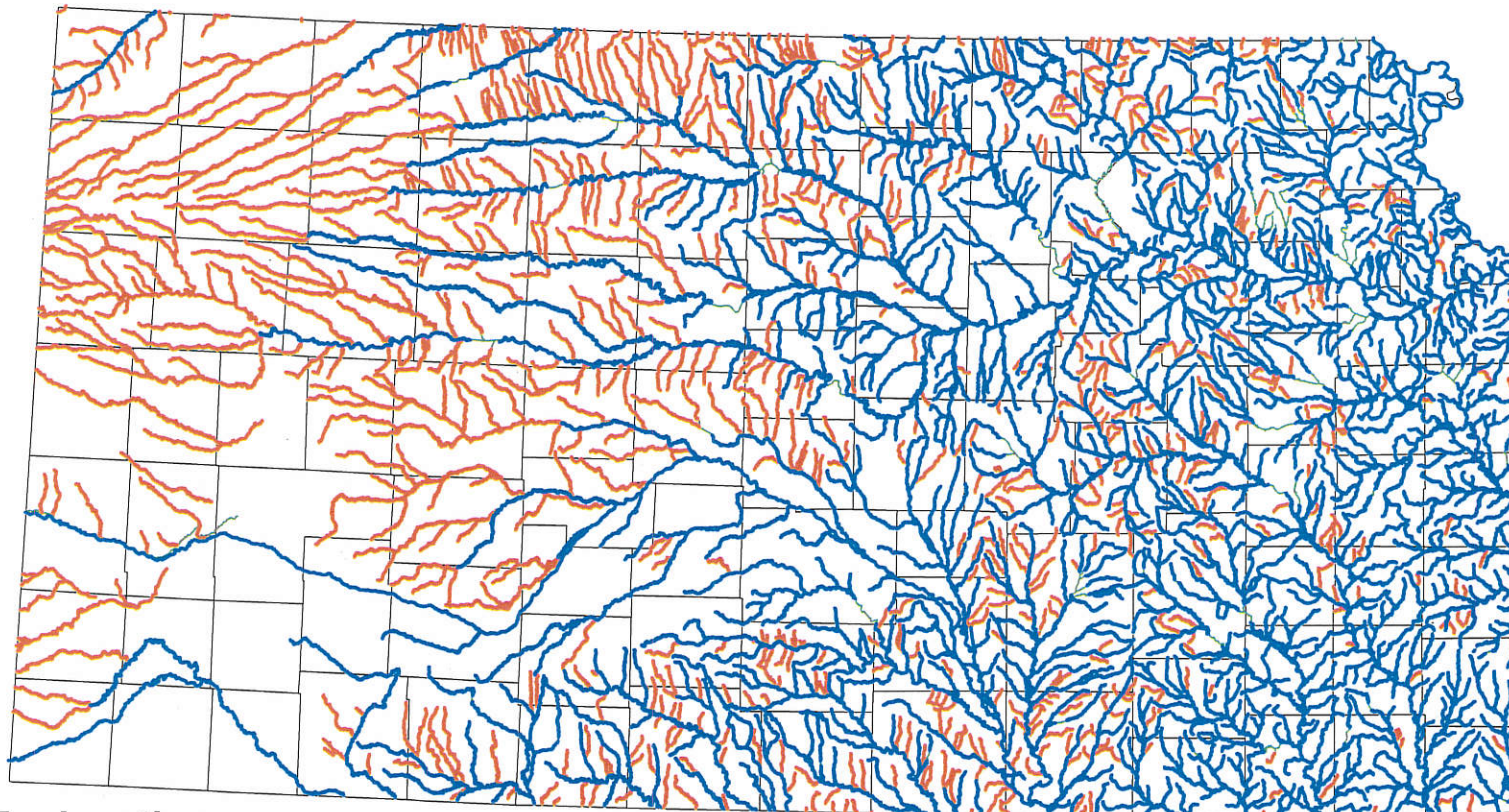
Reference: U.S. Geological Survey Water Resources Investigations Report 02-4292

Senate Natural Resources Committee
Date: February 4, 2003
Attachment 1





USGS

Median Streamflows Using All-Available Hydrology (AAH)

(All streamflow data at sites with 10 or more years of record)



Explanation

-  AAH Median flow ≥ 1 CFS
-  AAH Median flow < 1 CFS
-  Unclassified stream segment
-  County boundary

40 % of the stream segments of the Kansas Surface Water Register have less than 1 CFS median flow at their downstream end (AAH)

Reference: U.S. Geological Survey Water Resources Investigations Report 02-4292

*Senate Natural Resources Committee
Date: February 6, 2003
Attachment 2*



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Water Resources Division
4821 Quail Crest Place
Lawrence, Kansas 66049-3839

January 31, 2003

Dear Recipient:

Some typographic errors were found in tables 1 and 6 of Water-Resources Investigations Report 02-4292, "Estimates of Median Flows for Streams on the Kansas Surface Water Register," by Charles A. Perry, David M. Wolock, and Joshua C. Artman. The numbers have been corrected on our Web site at:

<http://ks.water.usgs.gov/Kansas/pubs/reports/wrir.02-4292.html>. The attached sheets are corrected versions with the corrections highlighted. Please replace these pages in your copy with the attached corrected pages.

Sincerely,

Walter R. Aucott
District Chief

Attachment

Senate Natural Resources Committee
Date: February 6, 2003
Attachment 3-1

3-2

Table 1. Streamflow-gaging stations and climatic and basin characteristics used in regression analyses of uncontrolled stream segments identified on the Kansas Surface Water Register¹

[ft³/s, cubic feet per second; mi², square miles; in/h, inches per hour. Shaded areas show corrections to original printed report.]

Station number (fig. 1)	Station name	Period of record (water years)	Years of record	Streamflow			Drainage area (mi ²)	Mean annual precipitation, 1960-90 ² (inches)	Mean basin permeability ³ (in/h)	Mean basin slope ⁴ (degrees)
				Mean (ft ³ /s)	Median for period or record (ft ³ /s)	Median for most-recent 10 years (ft ³ /s)				
06814000	Turkey Creek near Seneca, KS	1950-2000	51	129	22	30	276	32.35	0.467	3.1
06815000	Big Nemaha River at Falls City, NE	1944-2000	56	631	159	213	1,339	32.55	.510	2.8
06818200	Doniphan Creek at Doniphan, KS	1961-70	10	3.0	.87	.87	4.15	36.71	1.08	4.8
06836500	Driftwood Creek near McCook, NE	1977-86	10	9.5	4.8	5.0	361	20.94	1.30	2.9
06844700	South Fork Sappa Creek near Brewster, KS	1968-87	20	.23	0	0	71.3	18.40	1.30	.83
06844900	South Fork Sappa Creek near Achilles, KS	1960-2000	41	3.4	0	.28	412	19.20	1.30	1.4
06845000	Sappa Creek near Oberlin, KS	1930-2000	71	16	.70	1.9	1,086	19.82	1.32	1.5
06845200	Sappa Creek near Beaver City, NE	1938-72	35	38	5.0	4.5	1,500	20.57	1.36	1.9
06847900	Prairie Dog Creek above Keith Sebelius Lake, KS	1963-2000	38	9.0	2.1	6.1	590	20.65	1.36	1.7
06848000	Prairie Dog Creek at Norton, KS	1945-63	19	39	7.5	5.0	684	20.96	1.36	1.9
06848500	Prairie Dog Creek near Woodruff, KS	1930-63	34	57	10	5.0	1,007	21.56	1.37	2.1
06853800	White Rock Creek near Burr Oak, KS	1958-2000	43	29	6.0	12	227	26.49	1.30	2.5
06854000	White Rock Creek at Lovewell, KS	1947-56	10	68	5.7	5.7	354	27.07	1.31	2.6
06855800	Buffalo Creek near Jamestown, KS	1960-89	30	72	11	18	330	27.94	1.10	1.9
06855900	Wolf Creek near Concordia, KS	1963-81	19	11	1.0	1.6	56	28.76	1.01	2.5
06858500	North Fork Smoky Hill River near McAllaster, KS	1948-84	27	3.7	0	0	752	17.12	1.53	1.3
06859500	Ladder Creek below Chalk Creek near Scott City, KS	1952-79	28	8.0	1.9	1.3	1,432	17.65	1.40	1.0
06860000	Smoky Hill River at Elkader, KS	1940-2000	61	24	1.5	.57	3,555	17.67	1.53	1.3
06861000	Smoky Hill River near Arnold, KS	1951-2000	50	44	2.3	5.3	5,220	18.44	1.52	1.4
06863300	Big Creek near Ogallah, KS	1956-68	13	22	2.9	3.0	297	21.43	1.28	1.1
06863500	Big Creek near Hays, KS	1947-2000	54	33	7.9	19	594	21.80	1.18	1.4
06863900	North Fork Big Creek near Victoria, KS	1963-86	24	3.1	0	0	90.3	22.61	1.20	1.7
06864000	Smoky Hill River near Russell, KS	1940-49	10	184	40	40	6,965	19.48	1.46	1.4
06866000	Smoky Hill River near Lindsborg, KS	1906-47	42	244	57	86	8,110	20.60	1.46	1.5
06866500	Smoky Hill River near Mentor, KS	1925-47	23	329	116	197	8,358	20.84	1.45	1.6

Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses

[Estimated median flows are rounded to three significant figures; ft³/s, cubic feet per second. Reporting estimated median values to three significant figures (median greater than or equal to 1 ft³/s) or two significant figures (median less than 1 ft³/s) was done to better conform with the intent of KSA 82a-2001 et. seq. Shaded areas show corrections to original printed report.]

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1	102400051	Missouri River	48,000	42,400
2	1024000519	Missouri River	47,600	42,000
3	102400052	Missouri River	47,800	42,200
4	1024000521	Missouri River	47,600	2,000
5	10240005240	Unnamed stream	4.11	3.66
6	10240005339	Mission Creek	3.75	3.70
7	1024000551	Cedar Creek	7.72	7.25
8	1024000552	Mill Creek	4.01	3.92
9	1024000553	Wolf River	41.5	37.4
10	1024000554	Wolf River	17.6	15.4
11	1024000555	Unnamed stream	3.91	3.64
12	1024000556	Wolf River	14.8	12.8
13	1024000557	Wolf River, South Fork	5.77	4.86
14	1024000565	Spring Creek	2.37	2.31
15	1024000566	Wolf River, North Fork	2.22	1.92
16	1024000567	Wolf River, Middle Fork	4.32	3.62
17	1024000568	Haling Creek	4.21	3.79
18	1024000569	Rittenhouse Branch	2.46	2.44
19	1024000570	Cold Ryan Branch	3.48	3.32
20	1024000571	Coon Creek	4.75	4.68
21	1024000572	Striker Branch	2.22	2.28
22	1024000573	Mosquito Creek	6.95	6.89
23	1024000712	Wolf Creek	3.14	2.00
24	1024000713	Wolf Creek	1.05	.45
25	10240007132	Clear Creek	2.69	1.66
26	1024000714	Manley Creek	1.11	.50
27	1024000715	Big Nemaha River, South Fork	20.5	15.2
28	1024000716	Big Nemaha River, South Fork	16.1	11.9
29	10240007166	Harris Creek	3.23	2.16
30	1024000718	Deer Creek	3.35	2.16
31	1024000720	Rock Creek	1.23	.60
32	10240007212	Unnamed stream	1.14	.64
33	1024000723	Wildcat Creek	2.02	1.09
34	1024000724	Burger Creek	.82	.39
35	1024000725	Wolf Pen Creek	1.01	.39
36	1024000726	Honey Creek	0	0

Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses—Continued

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
735	102701021229	Deep Creek	2.64	2.14
736	1027010213	Kansas River	3,740	3,210
737	102701021365	Indian Creek	2.18	1.59
738	102701021367	Unnamed stream	0	0
739	102701021389	Unnamed stream	.47	.29
740	1027010214	Kansas River	3,650	3,440
741	1027010215	Vermillion Creek	65.7	50.54
742	1027010216	Vermillion Creek	34.7	23.3
743	1027010217	Vermillion Creek	27.7	17.6
744	1027010218	Vermillion Creek	10.6	7.32
745	1027010219	French Creek	5.90	4.05
746	102701022	Muddy Creek	11.4	9.47
747	1027010220	Indian Creek	3.58	2.57
748	1027010221	Rock Creek	27.9	23.4
749	1027010222	Rock Creek, East Fork	8.53	6.29
750	1027010223	Pleasant Hill Run	8.23	6.34
751	1027010224	Kansas River	3,470	2,720
752	1027010225	Kansas River	3,450	2,700
753	1027010226	Deep Creek	9.75	7.59
754	1027010227	Mill Creek	69.5	64.8
755	1027010228	Mill Creek, West Branch	19.1	16.5
756	1027010229	Mill Creek, West Branch	8.37	6.82
757	102701023	Kansas River	3,990	3,160
758	1027010230	Illinois Creek	4.96	3.81
759	1027010231	Mill Creek, East Branch	15.0	12.7
760	1027010232	Mill Creek, South Branch	5.29	4.16
761	1027010233	Mill Creek, East Branch	8.39	6.83
762	1027010234	Mission Creek	12.9	10.3
763	1027010235	Ross Creek	.70	.35
764	1027010236	Mission Creek	8.38	6.64
765	1027010237	Mission Creek	5.59	4.36
766	1027010238	Mission Creek, South Branch	2.12	1.57
767	1027010239	Shunganunga Creek	6.33	4.93
768	10270102394	Stinson Creek	.52	.24
769	102701024	Kansas River	3,950	3,130
770	1027010240	Shunganunga Creek	3.91	2.88
771	1027010241	Deer Creek	1.11	.67
772	1027010242	Mulberry Creek	.71	.25
773	1027010243	Hise Creek	2.83	1.99

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Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses—Continued

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1513	110300162	Spring Creek	3.59	2.78
1514	110300163	Ninnescah River	218	212
1515	110300164	Clearwater Creek	5.08	3.99
1516	1103001659	Polecat Creek	1.10	.67
1517	110300167	Clearwater Creek	2.81	2.08
1518	110300168	Ninnescah River	187	182
1519	1103001710	Satchel Creek	2.30	1.47
1520	1103001712	Durechen Creek	2.20	1.34
1521	1103001714	Walnut River	2.39	1.43
1522	1103001715	Cole Creek	2.39	2.33
1523	1103001716	Walnut River, West Branch	3.74	2.67
1524	1103001717	Whitewater River	45.0	40.9
1525	1103001718	Whitewater River	41.9	38.4
1526	1103001719	Whitewater River	15.7	13.4
1527	110300172	Walnut River	32.1	37.8
1528	1103001720	Fourmile Creek	1.37	.70
1529	1103001721	Whitewater River	9.32	7.53
1530	11030017213	Bird Creek	2.35	1.51
1531	1103001722	Whitewater River, East Branch	1.48	.77
1532	1103001723	Whitewater River	3.47	2.40
1533	1103001724	Whitewater River, West Branch	13.9	11.5
1534	1103001725	Whitewater River, West Branch	5.70	4.33
1535	1103001726	Wildcat Creek	2.45	1.62
1536	1103001727	Dry Creek	2.68	1.71
1537	1103001728	Wildcat Creek, West	.26	.01
1538	1103001729	Sand Creek	0	.01
1539	110300173	Walnut River	16.6	19.9
1540	1103001730	Gypsum Creek	.50	.03
1541	1103001731	Whitewater Creek, East Branch	.68	.14
1542	1103001732	Dry Creek	1.02	.41
1543	1103001733	Henry Creek	1.16	.51
1544	1103001734	Whitewater Creek	1.02	.42
1545	1103001735	Prairie Creek	.93	.36
1546	1103001736	Badger Creek	.62	.14
1547	1103001737	Rock Creek	1.46	.79
1548	1103001739	Gilmore Branch	.13	0
1549	1103001740	Sutton Creek	.56	.12
1550	1103001741	Constant Creek	.55	.10

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Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses—Continued

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1551	1103001742	Lower Branch	2.56	1.70
1552	1103001743	Elm Creek	.78	.30
1553	1103001744	Walnut Creek	.01	.01
1554	1103001745	School Branch	.29	0
1555	110300178	Bemis Creek	3.40	2.33
1556	110300181	Walnut River	241	276
1557	1103001810	Walnut River	154	177
1558	1103001811	Little Walnut River	20.5	16.5
1559	1103001812	Hickory Creek	8.00	6.19
1560	1103001813	Little Walnut River	11.2	8.75
1561	1103001814	Walnut River	118	136
1562	1103001815	Walnut River	108	124
1563	1103001816	Fourmile Creek	3.89	2.72
1564	1103001817	Polecat Creek	2.09	1.22
1565	1103001818	Black Crook Creek	1.54	.94
1566	1103001819	Cedar Creek	1.47	.83
1567	110300182	Timber Creek	10.9	8.35
1568	1103001820	Lower Dutch Creek	0	0
1569	1103001821	Chigger Creek	.19	0
1570	1103001822	Swisher Branch	.01	0
1571	1103001823	Durham Creek	0	0
1572	1103001824	Stalter Branch	0	0
1573	1103001825	Richland Creek	.56	.09
1574	1103001826	Foos Creek	.64	.20
1575	1103001827	Little Dutch Creek	.66	.18
1576	1103001828	Stewart Creek	.74	.18
1577	1103001829	Sanford Creek	0	0
1578	110300183	Timber Creek	4.52	3.31
1579	1103001830	Eightmile Creek	3.06	2.10
1580	1103001831	Crooked Creek	.40	.05
1581	1103001832	Spring Branch	.12	0
1582	1103001833	Honey Creek	.89	.39
1583	1103001834	Little Walnut River, South Branch	3.37	2.4
1584	1103001835	Rock Creek, North Branch	1.67	1.03
1585	1103001836	Plum Creek	1.12	.64
1586	1103001837	Posey Creek	1.19	.71
1587	110300184	Dutch Creek	3.41	2.34
1588	110300185	Walnut River	205	236
1589	110300186	Rock Creek	9.38	7.17

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Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1590	110300187	Walnut River	174	201
1591	110300188	Walnut River	168	194
1592	110300189	Muddy Creek	3.53	2.54
1593	110300189012	Hickory Creek, North Branch	2.00	1.34
1594	110400021	Cimarron River	3.19	3.80
1595	110400031	Cimarron River, North Fork	5.90	7.52
1596	110400032	Cimarron River, North Fork	1.22	1.55
1597	110400033	Unnamed stream	.02	.02
1598	110400034	Cimarron River, North Fork	0	0
1599	110400041	Sand Arroyo Creek	.47	.60
1600	110400051	Bear Creek	0	0
1601	1104000510	Buffalo Creek	0	0
1602	1104000511	Bear Creek	0	0
1603	110400052	Wolf Creek	0	0
1604	110400055	Dry Creek	0	0
1605	110400056	Bear Creek, North	0	0
1606	110400057	Little Bear Creek	0	0
1607	110400058	Beaty Creek	0	0
1608	110400059	Bear Creek	0	0
1609	110400061	Cimarron River	43.2	48.5
1610	110400062	Cimarron River	35.8	42.5
1611	110400071	Crooked Creek	8.70	12.0
1612	110400071180	Unnamed stream	0	0
1613	110400071247	Stumpie Arroyo	.02	.06
1614	110400071253	Unnamed stream	0	0
1615	110400071259	Unnamed stream	0	.01
1616	110400072	Crooked Creek	3.08	4.15
1617	110400073	Spring Creek	.04	.17
1618	110400074	Unnamed stream	0	0
1619	110400081	Cimarron River	44.9	53.2
1620	1104000810	Unnamed stream	1.91	1.54
1621	1104000811	Cimarron River	43.2	47.2
1622	110400081173	Wiggins Creek	0	0
1623	110400081180	Kiowa Creek, West	4.57	3.47
1624	110400081182	Kiowa Creek, Middle	1.15	.61
1625	1104000812	Kiowa Creek	8.07	6.58
1626	1104000813	Bluff Creek	5.89	4.37
1627	1104000814	Indian Creek	.02	0
1628	1104000815	Twomile Creek	0	0

Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses—Continued

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1629	1104000816	Unnamed stream	0	0
1630	1104000817	Stink Creek	0	0
1631	1104000818	Bear Creek	1.77	1.10
1632	1104000819	Trout Creek	1.11	.77
1633	110400082	Bluff Creek	19.9	17.8
1634	1104000820	Day Creek	1.39	.74
1635	1104000821	Snake Creek	2.26	1.73
1636	1104000825	Gyp Creek	.32	0
1637	110400083	Cavalry Creek	13.0	11.8
1638	110400085	Cimarron River	42.0	48.4
1639	110400086	Big Sandy Creek	13.0	11.4
1640	11040008652	Little Sandy Creek	1.39	.72
1641	110400087	Big Sandy Creek	6.90	5.69
1642	110400088	Kiger Creek	.58	.15
1643	110400089	Big Sandy Creek	5.48	4.43
1644	1105000124	Unnamed stream	1.09	.76
1645	1105000139	West Creek	0	0
1646	1106000111	Little Beaver Creek	2.57	1.93
1647	1106000114	Arkansas River	1,240	1,090
1648	1106000115	Grouse Creek	40.4	33.0
1649	1106000116	Grouse Creek	28.6	23.1
1650	1106000117	Silver Creek	8.07	6.12
1651	1106000118	Arkansas River	1,230	1,080
1652	1106000119	Chilocco Creek	.85	.42
1653	1106000120	Otter Creek	1.62	1.12
1654	1106000121	Spring Creek	1.03	.62
1655	1106000122	Shellrock Creek	.74	.42
1656	1106000124	Myers Creek	.23	.06
1657	1106000125	Snake Creek	.99	.46
1658	1106000126	Pebble Creek	.79	.30
1659	1106000127	Turkey Creek	.83	.41
1660	1106000128	Bullington Creek	1.34	.83
1661	1106000129	Crabb Creek	4.01	2.95
1662	1106000130	Blue Branch	.83	.40
1663	1106000131	School Creek	.87	.46
1664	1106000132	Cedar Creek	3.56	2.64
1665	1106000133	Plum Creek	.17	0
1666	1106000134	Goose Creek	1.33	.84
1667	1106000135	Franklin Creek	.78	.35

Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses—Continued

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1668	1106000136	Wagoner Creek	0.74	0.37
1669	1106000137	Riley Creek	.35	.07
1670	1106000138	Ferguson Creek	.86	.48
1671	1106000139	Gardners Branch	1.38	.88
1672	110600019	Beaver Creek	2.95	2.17
1673	1106000210	Arkansas River, Salt Fork	17.3	12.4
1674	1106000211	Arkansas River, Salt Fork	13.6	10.0
1675	1106000212	Wildcat Creek	.52	.15
1676	1106000213	Arkansas River, Salt Fork	11.7	8.75
1677	1106000214	Nescatunga Creek	4.05	3.38
1678	1106000215	Arkansas River, Salt Fork	4.69	3.33
1679	1106000216	Red Creek	2.26	1.43
1680	1106000217	Yellowstone Creek	1.92	1.03
1681	1106000220	Ash Creek	0	0
1682	1106000221	Inman Creek	1.17	.68
1683	1106000222	Deadman Creek	.64	.15
1684	1106000223	Hackberry Creek	1.05	.37
1685	1106000224	Spring Creek	.79	.46
1686	1106000227	Nescatunga Creek, East Branch	.27	0
1687	1106000228	Cave Creek	.34	0
1688	1106000229	Dog Creek	0	0
1689	1106000230	Cottonwood Creek	.35	0
1690	1106000231	Mustang Creek	.38	0
1691	110600024	Arkansas River, Salt Fork	47.4	29.1
1692	110600025	Big Sandy Creek	3.28	2.21
1693	11060002503	Unnamed stream	1.27	.91
1694	110600026	Arkansas River, Salt Fork	40.9	25.9
1695	110600027	Mule Creek	11.1	8.12
1696	110600028	Arkansas River, Salt Fork	20.7	14.6
1697	110600029	Indian Creek	1.82	1.22
1698	1106000310	Elm Creek, South East Branch	.59	.19
1699	1106000311	Crooked Creek	.62	.35
1700	1106000312	Amber Creek	1.43	1.16
1701	1106000313	Bear Creek	1.92	1.28
1702	1106000314	Mulberry Creek	.88	.50
1703	1106000315	Puckett Creek	.13	.01
1704	1106000316	Cottonwood Creek	.22	.01
1705	1106000317	Sand Creek	.64	.24
1706	1106000318	Bitter Creek	.26	.01

Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses—Continued

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1707	1106000319	Little Bear Creek	1.15	0.57
1708	110600032	Medicine Lodge River	109	85.0
1709	1106000320	Cedar Creek	2.59	1.78
1710	1106000321	Dry Creek	.91	.35
1711	1106000322	Antelope Creek	.01	0
1712	1106000323	Wilson Slough	.36	.01
1713	1106000324	Medicine Lodge River, North Branch	.29	.02
1714	1106000325	Otter Creek	.51	.17
1715	1106000326	Thompson Creek	2.79	1.98
1716	1106000327	Soldier Creek	3.81	3.07
1717	1106000328	Stink Creek	0	0
1718	110600033	Elm Creek	13.0	10.9
1719	11060003370	Unnamed stream	1.30	.84
1720	110600034	Elm Creek, North	1.52	1.05
1721	11060003415	Unnamed stream	.19	0
1722	11060003452	Unnamed stream	0	0
1723	110600035	Elm Creek, South	3.37	2.52
1724	11060003559	Unnamed stream	.01	0
1725	110600036	Medicine Lodge River	55.6	43.2
1726	110600037	Turkey Creek	2.55	1.83
1727	110600038	Medicine Lodge River	18.9	14.7
1728	110600039	Little Mule Creek	5.06	3.64
1729	110600039005	Elm Creek, South West Branch	.97	.50
1730	11060003905	Driftwood Creek	.65	.12
1731	1106000418	Pond Creek	.22	0
1732	1106000424	Crooked Creek	.13	0
1733	1106000425	Unnamed stream	.13	0
1734	1106000437	Sandy Creek	12.9	12.0
1735	1106000439	Little Sandy Creek	12.8	12.2
1736	1106000440	Salty Creek	3.21	2.26
1737	1106000465	Little Sandy Creek, East Branch	2.94	2.53
1738	1106000466	Spring Creek	.87	.63
1739	1106000467	Sandy Creek, West	3.11	2.99
1740	1106000468	Camp Creek	1.14	.75
1741	1106000469	Rush Creek	0	0
1742	1106000470	Plum Creek	.60	.20
1743	1106000471	Cooper Creek	1.50	.93
1744	110600049039	Little Sandy Creek, West Branch	2.75	2.22
1745	1106000510	Chikaskia River	10.8	9.65

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Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses—Continued

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1746	1106000511	Sand Creek	12.0	10.3
1747	1106000512	Sand Creek, East	6.85	5.84
1748	1106000514	Fall Creek	4.78	3.36
1749	1106000515	Bluff Creek	26.6	22.9
1750	1106000516	Bitter Creek, East	.30	0
1751	1106000517	Dry Creek	0	0
1752	1106000518	Spring Creek	.58	.13
1753	1106000519	Shoo Fly Creek, East	0	0
1754	1106000520	Meridian Creek	2.37	1.60
1755	1106000521	Spring Branch	.51	.02
1756	1106000522	Baehr Creek	1.53	.95
1757	1106000523	Rock Creek	2.10	1.45
1758	1106000524	Wildcat Creek	1.30	.81
1759	1106000525	Spring Creek	.77	.33
1760	1106000526	Rodgers Branch	0	0
1761	1106000527	Fall Creek, East Branch	.73	.19
1762	1106000528	Beaver Creek	.84	.31
1763	1106000529	Silver Creek	1.83	1.27
1764	1106000530	Sandy Creek	2.2	1.66
1765	1106000531	Spring Creek	3.33	2.65
1766	1106000532	Duck Creek	1.30	1.25
1767	1106000534	Big Spring Creek	2.34	2.20
1768	1106000535	Shore Creek	.72	.25
1769	1106000536	Chicken Creek	.85	.64
1770	1106000537	Chikaskia River, North Fork	1.77	1.44
1771	1106000538	Goose Creek	.58	.28
1772	1106000539	Skunk Creek	1.00	.73
1773	110600054	Bitter Creek	29.3	19.0
1774	1106000540	Allen Creek	1.25	.97
1775	1106000541	Wild Horse Creek	2.03	1.73
1776	1106000542	Copper Creek	0	0
1777	1106000543	Red Creek	2.73	2.33
1778	1106000544	Rose Bud Creek	.56	.37
1779	1106000545	Rush Creek	2.88	2.32
1780	1106000546	Beaver Creek	1.17	.63
1781	1106000547	Spring Creek	2.17	1.55
1782	1106000548	Blue Stem Creek	.20	.02
1783	1106000549	Kemp Creek	.58	.33
1784	11060005512	Prairie Creek	3.18	2.32

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Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses—Continued

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1785	11060005516	Prairie Creek, East	3.00	2.16
1786	11060005527	Prairie Creek, West	1.62	1.06
1787	11060005529	Long Creek	0	0
1788	110600056	Shoo Fly Creek	6.3	4.71
1789	110600058	Chikaskia River	117	104
1790	110600059	Chikaskia River	67.4	60.4
1791	110600059006	Shoo Fly Creek, West	.96	.40
1792	110701011	Verdigris River	296	276
1793	1107010111	Verdigris River	64.7	55.8
1794	1107010112	Verdigris River	46.0	39.4
1795	1107010113	Verdigris River, North Branch	17.8	14.7
1796	1107010114	Rock Creek	1.95	1.36
1797	1107010115	Verdigris River, North Branch	11.9	9.60
1798	1107010116	Verdigris River, Bernard Branch	4.58	3.61
1799	1107010117	West Creek	10.6	8.31
1800	1107010119	Walnut Creek	16.7	13.5
1801	110701012	Buffalo Creek	17.0	16.0
1802	1107010120	Homer Creek	4.54	3.28
1803	1107010121	Bachelor Creek	5.37	3.89
1804	1107010122	Chetopa Creek	6.30	5.63
1805	1107010123	Onion Creek	.48	.05
1806	1107010124	Bernard Creek	.04	0
1807	1107010125	Slate Creek	2.91	1.99
1808	1107010126	Greenhall Creek	2.79	2.27
1809	1107010127	Dry Creek	4.43	4.03
1810	1107010128	Fancy Creek	2.67	2.33
1811	1107010129	Kuntz Branch	2.46	1.91
1812	110701013	Verdigris River	62.8	93.3
1813	1107010130	Miller Creek	2.49	2.10
1814	1107010131	Brazil Creek	3.51	3.22
1815	1107010132	Cedar Creek	1.91	1.77
1816	1107010133	Little Sandy Creek	3.24	3.12
1817	1107010134	Buffalo Creek, West	6.86	6.59
1818	1107010135	Ross Branch	5.71	5.22
1819	1107010136	Snake Creek	2.81	2.42
1820	1107010137	Elder Branch	4.34	4.15
1821	1107010138	Crooked Creek	3.70	3.58
1822	1107010139	Big Cedar Creek	4.25	3.82
1823	110701014	Sandy Creek	12.3	11.8

Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses—Continued

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1824	1107010140	Shaw Creek	1.58	1.06
1825	1107010141	Wolf Creek	1.68	1.13
1826	1107010142	Kelly Branch	.60	.25
1827	1107010143	Moon Branch	1.05	.57
1828	1107010144	Tate Branch Creek	1.78	1.23
1829	1107010145	Long Creek	1.66	1.19
1830	1107010146	Van Horn Creek	1.13	.63
1831	1107010147	Holderman Creek	.95	.46
1832	11070101471	Little Chetopa Creek	2.45	2.37
1833	110701015	Verdigris River	45.8	80.1
1834	110701019017	Willow Creek	3.43	2.37
1835	110701021	Fall River	120	102
1836	1107010211	Fall River, West Branch	13.9	10.3
1837	1107010212	Spring Creek	11.7	8.80
1838	1107010213	Otter Creek	12.9	12.3
1839	1107010214	Salt Creek	6.34	5.05
1840	1107010215	Indian Creek	7.69	6.73
1841	1107010217	Rainbow Creek, East	3.80	3.35
1842	1107010218	Battle Creek	.45	.11
1843	1107010219	Ivanpah Creek	3.17	2.33
1844	110701022	Fall River	73.1	70.5
1845	1107010220	Otis Creek	1.88	1.25
1846	1107010221	Oleson Creek	1.55	1.00
1847	1107010223	Watson Branch	1.86	1.33
1848	1107010224	Burnt Creek	2.71	1.92
1849	1107010225	Coon Creek	1.41	.98
1850	1107010226	Honey Creek	1.41	.81
1851	1107010227	Kitty Creek	.43	.11
1852	1107010228	Otter Creek, South Branch	3.33	2.69
1853	1107010229	Tadpole Creek	.66	.25
1854	110701023	Fall River	49.5	56.3
1855	1107010230	Plum Creek	.27	0
1856	1107010231	Snake Creek	.57	.16
1857	1107010232	Crain Creek	4.30	4.04
1858	1107010233	Silver Creek	5.67	5.80
1859	1107010234	Little Indian Creek	2.29	2.20
1860	1107010235	Little Salt Creek	1.72	1.39
1861	1107010236	Coon Creek	3.20	2.99
1862	1107010237	Clear Creek	3.36	3.16

Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses—Continued

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1863	1107010238	Salt Creek	2.40	1.96
1864	11070102635	Fall River, East Branch	9.12	6.74
1865	110701027	Fall River	73.5	54.0
1866	110701028	Fall River	57.6	40.5
1867	110701029	Fall River	29.7	21.4
1868	11070102989	Swing Creek	1.79	1.2
1869	1107010321	Big Creek	.40	.34
1870	1107010325	Snow Creek	3.87	3.65
1871	1107010327	Verdigris River	564	498
1872	1107010328	Pumpkin Creek	13.7	13.2
1873	1107010329	Verdigris River	528	466
1874	1107010330	Big Hill Creek	13.0	11.8
1875	1107010331	Potatoe Creek	2.06	2.01
1876	1107010332	Big Hill Creek	9.04	8.27
1877	1107010333	Verdigris River	493	435
1878	1107010334	Drum Creek	9.55	9.00
1879	1107010335	Verdigris River	465	410
1880	1107010336	Verdigris River	455	401
1881	1107010337	Dry Creek	4.85	4.77
1882	1107010338	Verdigris River	296	276
1883	1107010339	Onion Creek	17.5	16.5
1884	1107010349	Richland Creek	3.09	2.98
1885	1107010350	Claymore Creek	1.04	.92
1886	1107010351	Deer Creek	2.58	2.43
1887	1107010352	Sycamore Creek	1.74	1.63
1888	1107010353	Biscuit Creek	1.00	1.07
1889	1107010354	Bluff Run	2.24	2.36
1890	1107010355	Spring Creek	.86	.63
1891	1107010356	Fawn Creek	2.55	2.37
1892	1107010357	Deadman Creek	4.09	4.15
1893	1107010358	Rock Creek	4.07	3.66
1894	1107010359	Mud Creek	2.04	2.17
1895	1107010360	Wildcat Creek	2.44	2.62
1896	1107010361	Rock Creek	1.72	1.77
1897	1107010362	Prior Creek	2.43	2.62
1898	1107010363	Choteau Creek	3.44	3.47
1899	110701041	Elk River	42.4	33.8
1900	1107010410	Elk River	15.8	17.1
1901	1107010411	Pawpaw Creek	4.11	3.42

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Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses—Continued

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1902	1107010412	Elk River	11.5	11.2
1903	1107010413	Rock Creek	2.81	2.18
1904	1107010414	Elk River	8.82	7.86
1905	1107010415	Elk River, Mound Branch	2.42	1.83
1906	1107010416	Wildcat Creek	3.32	2.46
1907	1107010417	Salt Creek	12.7	12.0
1908	1107010418	Chetopa Creek	.67	.35
1909	1107010419	Card Creek	3.35	3.33
1910	110701042	Elk River	60.1	60.1
1911	1107010420	Coffey Branch	3.34	3.43
1912	1107010421	Racket Creek	3.63	3.51
1913	1107010422	Sycamore Creek	5.97	5.69
1914	1107010423	Elm Branch	1.69	1.51
1915	1107010424	Little Duck Creek	2.09	2.02
1916	1107010425	Bachelor Creek	3.91	3.77
1917	1107010426	Bloody Run	2.35	2.41
1918	1107010427	Pan Creek	1.68	1.65
1919	1107010428	Hickory Creek	4.22	4.08
1920	1107010429	Salt Creek, South	2.43	2.39
1921	110701043	Duck Creek	8.56	7.79
1922	1107010430	Clear Creek	2.77	2.48
1923	1107010431	Skull Creek	0	0
1924	1107010432	Clear Creek	1.35	.88
1925	1107010433	Bull Creek	.58	.25
1926	1107010434	Snake Creek	1.28	.75
1927	1107010435	Hitchen Creek, East	.95	.77
1928	1107010436	Painterhood Creek, East	3.04	2.80
1929	1107010437	Little Hitchen Creek	3.17	3.19
1930	1107010438	Elk River, South Branch	1.61	1.16
1931	1107010439	Rowe Branch Elk River	1.49	1.02
1932	110701044	Elk River	51.5	52.0
1933	110701045	Painterhood Creek	7.71	7.09
1934	110701046	Elk River	34.1	35.6
1935	110701047	Hitchen Creek	8.50	7.59
1936	110701048	Elk River	26.2	28.3
1937	110701049	Elk River	19.0	22.0
1938	1107010610	Little Caney Creek	20.6	19.5
1939	1107010611	Caney Creek, North	16.9	16.1
1940	1107010612	Caney Creek, Middle	16.7	14.9

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Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses—Continued

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1941	1107010619	Caney River	65.2	40.5
1942	1107010620	Caney River	17.8	12.4
1943	1107010621	Otter Creek	6.70	5.01
1944	1107010628	Rock Creek	8.96	6.83
1945	1107010629	Dry Creek	2.69	2.08
1946	1107010630	Cedar Creek	5.31	3.95
1947	1107010631	Sycamore Creek	5.07	4.15
1948	1107010632	Cedar Creek	7.62	7.40
1949	1107010633	Otter Creek	5.10	5.03
1950	1107010634	Lake Creek	7.59	7.2
1951	1107010635	Wolf Creek	4.83	4.81
1952	1107010636	Coon Creek	4.81	4.74
1953	1107010637	Cotton Creek, North Fork	0	0
1954	1107010638	Cotton Creek	1.60	1.40
1955	1107010639	Illinois Creek	4.11	4.06
1956	1107010640	Cheyenne Creek	5.32	4.89
1957	1107010641	Union Creek	2.51	1.83
1958	1107010642	Squaw Creek	1.10	.68
1959	1107010643	Pool Creek	3.32	2.7
1960	1107010644	Spring Creek	2.90	2.21
1961	1107010645	Turkey Creek	2.37	2.24
1962	1107010646	Fly Creek	5.08	5.17
1963	1107010647	Bachelor Creek	3.82	3.71
1964	1107010648	California Creek	4.40	4.44
1965	1107010649	Jim Creek	1.39	.90
1966	1107010650	Wolf Creek	1.58	1.02
1967	11070106509	Hafer Run	2.53	2.45
1968	1107010651	Corum Creek	.85	.35
1969	1107010652	Caney River, East Fork	1.85	1.29
1970	1107010653	Spring Creek	2.49	1.84
1971	1107010674	Possum Trot Creek	2.90	2.46
1972	110701068	Little Caney Creek	10.9	12.4
1973	110701069	Bee Creek	12.8	12.1
1974	110702011	Neosho River	429	394
1975	1107020110	Neosho River	37.6	37.7
1976	1107020111	Neosho River	15.0	13.0
1977	1107020118	Munkers Creek	4.70	3.33
1978	110702012	Neosho River	94.9	94.9
1979	1107020121	Lanos Creek	2.20	1.35

Table 6. Stream segments on the Kansas Surface Water Register, CUSEGA numbers, stream names, and estimated median flows at downstream end of CUSEGA segments using the most-recent 10 years of record (KSA) and all-available hydrology (AAH) analyses—Continued

Stream segment number (plate 1)	CUSEGA number	Stream name	Estimated median flows (ft ³ /s)	
			KSA analysis	AAH analysis
1980	1107020123	Neosho River	8.33	6.06
1981	1107020124	Four Mile Creek	5.15	3.69
1982	1107020125	Eagle Creek	7.61	5.94
1983	1107020126	Neosho River	412	384
1984	1107020127	Parkers Creek	.48	0
1985	1107020128	Neosho River, West Fork	.34	0
1986	1107020129	Haun Creek	.79	.24
1987	110702013	Allen Creek	6.84	5.09
1988	1107020130	Lairds Creek	1.63	.90
1989	1107020131	Munkers Creek, East Branch	.80	.29
1990	1107020132	Munkers Creek, Middle Branch	1.62	.93
1991	1107020133	Horse Creek	1.01	.49
1992	1107020134	Rock Creek, East Branch	1.09	.57
1993	1107020135	Crooked Creek	.80	.30
1994	1107020136	Elm Creek	2.98	1.96
1995	1107020137	Big John Creek	3.34	2.34
1996	1107020138	Wrights Creek	2.18	1.44
1997	1107020139	East Creek	.56	.13
1998	110702014	Dows Creek	2.49	1.63
1999	1107020140	Spring Creek	.49	.10
2000	1107020141	Wolf Creek	.69	.28
2001	1107020142	Walker Branch	1.04	.60
2002	1107020143	Kahola Creek	2.92	2.07
2003	1107020144	Stillman Creek	.13	0
2004	1107020145	Badger Creek	2.32	1.58
2005	1107020146	Taylor Creek	.22	0
2006	1107020147	Eagle Creek, South	.85	.41
2007	1107020148	Fourmile Creek	2.46	1.73
2008	1107020149	Plumb Creek	.52	.13
2009	110702015	Allen Creek	3.50	2.45
2010	1107020150	Plum Creek	2.36	1.69
2011	1107020151	Lebo Creek	2.82	2.05
2012	110702016	Neosho River	68.6	71.4
2013	110702017	Rock Creek	11.3	8.7
2014	110702018	Bluff Creek	3.48	2.50
2015	110702019	Rock Creek	7.24	5.43
2016	110702019023	Level Creek	.14	0
2017	11070201946	Unnamed stream	0	0
2018	110702021	Cottonwood River	95.8	98.4



News Release

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Median Flow Estimated for Kansas Stream Segments

The U.S. Geological Survey (USGS) today released the results of a study to estimate median flows for streams in Kansas. The Kansas State Legislature, by enacting Kansas Statute KSA 82a-2001 et. seq., mandated the criteria for determining which Kansas stream segments would be subject to classification and water-quality regulation by the State.

The streamflow study, conducted by the USGS in cooperation with the Kansas Department of Health and Environment, estimated the median flow at the downstream end of the 2,232 stream segments on the Kansas Surface Water Register. One criterion established by the statute for the selection as a classified stream segment is based on the statistic of median flow (the flow that is equaled or exceeded at least half of the time) being equal to or greater than 1 cubic foot per second.

As mandated by the statute, streamflow information from the most recent 10 years of record for USGS streamgaging stations within Kansas and in adjacent states was used to make the estimates. Using the streamflow information from the most recent 10 years of record for each gaging station, 30 percent of the 2,232 stream segments on the Kansas Surface Water Register had median flow values of less than 1 cubic foot per second and as designated in the statute would be removed from the Register unless other criteria existed for them to be retained.

The USGS, in its continuing mission to provide hydrologic information for the Nation, conducted an additional analysis of the median flows in Kansas streams using all-available hydrologic information. This analysis differed only in that it considered the entire period of record for each streamgaging station instead of only the most recent 10 years. In this analysis, 40 percent of the 2,232 stream segments on the Kansas Surface Water Register had median flows of less than 1 cubic foot per second. This analysis reflects long-term streamflow records that on the average are dryer than the most recent 10 years.

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*Senate Natural Resources Committee
Date: February 6, 2003
Attachment # - 1*

Results of the USGS study are printed in, "Estimates of median flows for streams on the Kansas Surface Water Register," by Charles A. Perry, David M. Wolock, and Joshua C. Artman. Copies of Water-Resources Investigations Report 02-4292 are available from the USGS Information Services, Box 25286, Federal Center, Denver, CO 80225-0286, or call 1-888-ASK-USGS. A limited number of paper copies are available from the USGS office in Lawrence, Kansas. To view the report and other information about this study online, visit:

<http://ks.water.usgs.gov/Kansas/strmstats>

For a statewide color map summarizing the study results, visit:

<http://ks.water.usgs.gov/Kansas/strmstats/index.shtml>

For other water information in Kansas, visit:

<http://ks.water.usgs.gov>

The USGS, a bureau within the Department of the Interior, serves the nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

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