

AREA NAME	4/1/90 Census	4/1/80 Census	% Change, 80 to 90
CUSTER COUNTY	11,697	13,109	-10.8%
ISMAY	19	31	-38.7%
MILES CITY	8,461	9,602	-11.9%
DANIELS COUNTY	2,266	2,835	-20.1%
FLAXVILLE	88	142	-38.0%
SCOBAY	1,154	1,382	-16.5%
DAWSON COUNTY	9,505	11,805	-19.5%
GLENDIVE	4,802	5,978	-19.7%
RICHEY	259	417	-37.9%
DEER LODGE COUNTY	10,278	12,518	-17.9%
ANACONDA-DEER LODGE	10,278	12,518	-17.9%
FALLON COUNTY	3,103	3,763	-17.5%
BAKER	1,818	2,354	-22.8%
PLEVNA	140	191	-26.7%
FERGUS COUNTY	12,083	13,076	-7.6%
DENTON	350	356	-1.7%
GRASS RANGE	159	139	14.4%
LEWISTOWN	6,051	7,104	-14.8%
MOORE	211	229	-7.9%
WINIFRED	150	155	-3.2%
FLATHEAD COUNTY	59,218	51,966	14.0%
COLUMBIA FALLS	2,942	3,112	-5.5%
KALISPELL	11,917	10,689	11.5%
WHITEFISH	4,368	3,703	18.0%
GALLATIN COUNTY	50,463	42,865	17.7%
BELGRADE	3,411	2,336	46.0%
BOZEMAN	22,660	21,645	4.7%
MANHATTAN	1,034	988	4.7%
THREE FORKS	1,203	1,247	-3.5%
WEST YELLOWSTONE	913	735	24.2%
GARFIELD COUNTY	1,589	1,656	-4.0%
JORDAN	494	485	1.9%
GLACIER COUNTY	12,121	10,628	14.0%
BROWNING	1,170	1,226	-4.6%
CUT BANK	3,329	3,688	-9.7%

AREA NAME	4/1/90 Census	4/1/80 Census	% Change, 80 to 90
GOLDEN VALLEY COUNTY	912	1,026	-11.1%
LAVINA	151	164	-7.9%
RYEGATE	260	273	-4.8%
GRANITE COUNTY	2,548	2,700	-5.6%
DRUMMOND	264	414	-36.2%
PHILIPSBURG	925	1,138	-18.7%
HILL COUNTY	17,654	17,985	-1.8%
HAVRE	10,201	10,891	-6.3%
HINGHAM	181	186	-2.7%
JEFFERSON COUNTY	7,939	7,029	12.9%
BOULDER	1,316	1,441	-8.7%
WHITEHALL	1,067	1,030	3.6%
JUDITH BASIN COUNTY	2,282	2,646	-13.8%
HOBSON	226	261	-13.4%
STANFORD	529	595	-11.1%
LAKE COUNTY	21,041	19,056	10.4%
POLSON	3,283	2,798	17.3%
RONAN	1,547	1,530	1.1%
ST. IGNATIUS	778	877	-11.3%
LEWIS & CLARK COUNTY	47,495	43,039	10.4%
EAST HELENA	1,538	1,647	-6.6%
HELENA	24,569	23,938	2.6%
LIBERTY COUNTY	2,295	2,329	-1.5%
CHESTER	942	963	-2.2%
LINCOLN COUNTY	17,481	17,752	-1.5%
EUREKA	1,043	1,119	-6.8%
LIBBY	2,532	2,748	-7.9%
REXFORD	132	130	1.5%
TROY	953	1,088	-12.4%
MCCONE COUNTY	2,276	2,702	-15.8%
CIRCLE	805	931	-13.5%
MADISON COUNTY	5,989	5,448	9.9%
ENNIS	773	660	17.1%
SHERIDAN	652	646	0.9%
TWIN BRIDGES	374	437	-14.4%
VIRGINIA CITY	142	192	-26.0%

AREA NAME	4/1/90 Census	4/1/80 Census	% Change, 80 to 90
MEAGHER COUNTY	1,819	2,154	-15.6%
WHITE SULPHUR SPRINGS	963	1,302	-26.0%
MINERAL COUNTY	3,315	3,675	-9.8%
ALBERTON	354	368	-3.8%
SUPERIOR	881	1,054	-16.4%
MISSOULA COUNTY	78,687	76,016	3.5%
MISSOULA	42,918	34,893	23.0%
MUSSELSHELL COUNTY	4,106	4,428	-7.3%
MELSTONE	166	238	-30.3%
ROUNDUP	1,808	2,119	-14.7%
PARK COUNTY	14,562	12,869	13.2%
CLYDE PARK	282	283	-0.4%
LIVINGSTON	6,701	6,994	-4.2%
PETROLEUM COUNTY	519	655	-20.8%
WINNETT	188	207	-9.2%
PHILLIPS COUNTY	5,163	5,367	-3.8%
DODSON	137	158	-13.3%
MALTA	2,340	2,367	-1.1%
SACO	261	252	3.6%
PONDERA COUNTY	6,433	6,731	-4.4%
CONRAD	2,891	3,074	-6.0%
VALIER	519	640	-18.9%
POWDER RIVER COUNTY	2,090	2,520	-17.1%
BROADUS	572	712	-19.7%
POWELL COUNTY	6,620	6,958	-4.9%
DEER LODGE	3,378	4,023	-16.0%
PRAIRIE COUNTY	1,383	1,836	-24.7%
TERRY	659	929	-29.1%
RAVALLI COUNTY	25,010	22,493	11.2%
DARBY	625	581	7.6%
HAMILTON	2,737	2,661	2.9%
PINESDALE	670	458	46.3%
STEVENSVILLE	1,221	1,207	1.2%

AREA NAME	4/1/90 Census	4/1/80 Census	% Change, 80 to 90
RICHLAND COUNTY	10,716	12,243	-12.5%
FAIRVIEW	869	1,366	-36.4%
SIDNEY	5,217	5,726	-8.9%
ROOSEVELT COUNTY	10,999	10,467	5.1%
BAINVILLE	165	245	-32.7%
BROCKTON	365	374	-2.4%
CULBERTSON	796	887	-10.3%
FROID	195	323	-39.6%
POPLAR	881	995	-11.5%
WOLF POINT	2,880	3,074	-6.3%
ROSEBUD COUNTY	10,505	9,899	6.1%
FORSYTH	2,178	2,553	-14.7%
SANDERS COUNTY	8,669	8,675	-0.1%
HOT SPRINGS	411	601	-31.6%
PLAINS	992	1,116	-11.1%
THOMPSON FALLS	1,319	1,478	-10.8%
SHERIDAN COUNTY	4,732	5,414	-12.6%
MEDICINE LAKE	357	408	-12.5%
OUTLOOK	109	122	-10.7%
PLENTYWOOD	2,136	2,476	-13.7%
WESTBY	253	291	-13.1%
SILVER BOW COUNTY	33,941	38,092	-10.9%
BUTTE-SILVER BOW	33,336	37,205	-10.4%
WALKERVILLE	605	887	-31.8%
STILLWATER COUNTY	6,536	5,598	16.8%
COLUMBUS	1,573	1,439	9.3%
SWEET GRASS COUNTY	3,154	3,216	-1.9%
BIG TIMBER	1,557	1,690	-7.9%
TETON COUNTY	6,271	6,491	-3.4%
CHOTEAU	1,741	1,798	-3.2%
DUTTON	392	359	9.2%
FAIRFIELD	660	650	1.5%
TOOLE COUNTY	5,046	5,559	-9.2%
KEVIN	185	208	-11.1%
SHELBY	2,763	3,142	-12.1%
SUNBURST	437	476	-8.2%

AREA NAME	4/1/90 Census	4/1/80 Census	% Change, 80 to 90
TREASURE COUNTY	874	981	-10.9%
HYSHAM	361	449	-19.6%
VALLEY COUNTY	8,239	10,250	-19.6%
FORT PECK	325	293	10.9%
GLASGOW	3,572	4,455	-19.8%
NASHUA	375	495	-24.2%
OPHEIM	145	210	-31.0%
WHEATLAND COUNTY	2,246	2,359	-4.8%
HARLOWTON	1,049	1,181	-11.2%
JUDITH GAP	133	213	-37.6%
WIBAUX COUNTY	1,191	1,476	-19.3%
WIBAUX	628	782	-19.7%
YELLOWSTONE COUNTY	113,419	108,035	5.0%
BILLINGS	81,151	66,842	21.4%
BROADVIEW	133	120	10.8%
LAUREL	5,686	5,498	3.4%
YELLOWSTONE NAT'L PARK	52	66	-21.2%
BLACKFEET RESERVATION	8,549	6,660	28.4%
CROW RESERVATION	6,370	5,973	6.6%
FLATHEAD RESERVATION	21,259	19,628	8.3%
FORT BELKNAP RESERVATION	2,508	2,060	21.7%
FORT PECK RESERVATION	10,595	9,921	6.8%
NORTHERN CHEYENNE RESERVATION	3,923	3,664	7.1%
ROCKY BOY'S RESERVATION	1,954	1,650	18.4%
CROW/NORTHERN CHEYENNE AREA	7	8	-12.5%

APPENDIX C

Adjacent Region Approvals

National Public Safety Plan
FCC Region 25
Planning Committee

- Committee-at-Large
- Jim Adkins
Mt. Deaconess Medical Center
- Charles Aron, Jr. †
Columbus Hospital
- John Benson
West Yellowstone EMS/Fire
- Allen Bertapelle †
Mt. Private Ambulance Operators
- Bob Cardwell
General Electric
- Drew Dawson †
EHS Bureau
- Elmer Davis
Dept. of Fish, Wildlife, and Parks
- Jerry Dupler
Department of Transportation
- Bob DeLange
Department of State Lands
- Bill Fleiner †
Mt. Sheriffs & Peace Off. Assoc.
- Jesse Y. Gonzalez †
Billings 9-1-1
- Fred Guadagnoli
Blackfoot Tribal EMS
- Don Houghton
Gallatin Co. Sheriffs Office
- Jim Kraft
Yellowstone County DES
- Charlie Larson †
Montana Highway Patrol
- Franklin Mick Mills
Lincoln County DES
- Rick Newby †
Miles City Police Department
- Richard A. Nisbet †
City of Helena
- Ray Nordhagen
City of Missoula
- Douglas Pitt †
Mt. State Fire Chiefs Association
- Chuck Rhodes †
Flathead Co. Search and Rescue
- Clark Robinson
Gallatin County
- John Skaggs
Motorola
- Midge Warrington
Cascade County 9-1-1
- Homer Young
Mt. Disaster & Emergency Svcs. Div.
- † Member of Working Committee

Bill Jameson, Chairman
Montana State University

Dan Hawkins, Plan Coordinator
Department of Administration

April 9, 1992

Stan Passey, Chairman
NPSPAC Region 12
Idaho Bureau of Communications
3311 W. State
Boise, ID 83720-0001

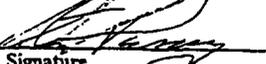
Dear Mr. Passey:

Enclosed is our final draft Public Safety Plan for Region 25, the State of Montana. This plan has been developed and approved by our Regional Planning Committee. It is submitted for your review and coordination as required by the F.C.C.

If your region does not find any conflicts with our proposal, please indicate by signing below and returning within thirty (30) days of the date of this letter.


800
 Signature _____ Date 4/10/92
MHZ
 W. J. Jameson, Jr.
 Region 25 Chairman

Region 12 has reviewed and concurs with the Region 25 National Public Safety Plan.


 Signature _____ Date 4-24-92

APPENDIX C

Adjacent Region Approvals (cont.)

National Public Safety Plan
FCC Region 25
Planning Committee

- Committee-at-Large
- Jim Adkins
Mt. Deaconess Medical Center
- Charles Aron, Jr. †
Columbus Hospital
- John Benson
West Yellowstone EMS/Fire
- Allen Bertapelle †
Mt. Private Ambulance Operators
- Bob Cardwell
General Electric
- Drew Dawson †
EMS Bureau
- Elmer Davis
Dept. of Fish, Wildlife, and Parks
- Jerry Dupler
Department of Transportation
- Bob DeLange
Department of State Lands
- Bill Fleiner †
Mt. Sheriffs & Peace Off. Assoc.
- Jesse Y. Gonzalez †
Billings 9-1-1
- Fred Guardipee
Blackfoot Tribal EMS
- Don Houghton
Gallatin Co. Sheriffs Office
- Jim Kraft
Yellowstone County DES
- Charlie Larson †
Montana Highway Patrol
- Franklin Mick Mills
Lincoln County DES
- Rick Newby †
Miles City Police Department
- Richard A. Nisbet †
City of Helena
- Ray Nordhagen
City of Missoula
- Douglas Pitt †
Mt. State Fire Chiefs Association
- Chuck Rhodes †
Flathead Co. Search and Rescue
- Clark Robinson
Gallatin County
- John Skaggs
Motorola
- Midge Warrington
Cascade County 9-1-1
- Homer Young
Mt. Disaster & Emergency Svcs. Div.
- † Member of Working Committee

Bill Jameson, Chairman
Montana State University

Dan Hawkins, Plan Coordinator
Department of Administration

April 9, 1992

Todd Dravland, Convenor
NPSPAC Region 38
State Radio Communications
500 East Capitol
Pierre, SD 57501-5070

Dear Mr. Dravland:

Enclosed is our final draft Public Safety Plan for Region 25, the State of Montana. This plan has been developed and approved by our Regional Planning Committee. It is submitted for your review and coordination as required by the F.C.C.

If your region does not find any conflicts with our proposal, please indicate by signing below and returning within thirty (30) days of the date of this letter.

W. J. Jameson, Jr.
Signature

800
MHz

4/16/92
Date

W. J. Jameson, Jr.
Region 25 Chairman

Region 38 has reviewed and concurs with the Region 25 National Public Safety Plan.

Todd R. Dravland
Signature

5/08/92
Date

APPENDIX C

Adjacent Region Approvals (cont.)



**Washington State
Department of Transportation**

Transportation Building KF-01
Olympia, Washington 98504-5201
(206) 753-6005

Duane Berentson
Secretary of Transportation

May 13, 1992

W. J. Jameson, Jr., Chairman
Region 25 NPSPAC Planning Committee
Department of Electrical Engineering
Montana State University
Bozeman, MT 59717

Dear Mr. Jameson:

Thank you for the opportunity to review and comment on the Region 25 NPSPAC Plan. You and your committee are to be congratulated for a job well done.

Our only other comment is that since your plan identifies specific sites which are located on very high mountains, we wish the opportunity to review any channel requests which may impact on the Eastern border of the State of Washington. Thank you.

We look forward to the early approval of the Region 25 NPSPAC Plan.

Sincerely,

A handwritten signature in cursive that reads "Alan C. Hull".

ALAN C. HULL
Chairman, Region 43

ACH:sn513

cc: Kevin Kerns, Chairman Region 43 Review Committee
Alireza Shahnami, APCO

APPENDIX C

Adjacent Region Approvals (cont.)

National Public Safety Plan
FCC Region 25
Planning Committee

- Committee-at-Large
- Jim Adkins
- Mt. Deaconess Medical Center
- Charles Aron, Jr. †
- Columbus Hospital
- John Banson
- West Yellowstone EMS/Fire
- Allen Bartapelle †
- Mt. Private Ambulance Operators
- Bob Cardwell
- General Electric
- Drew Dawson †
- EMS Bureau
- Elmer Davis
- Dept. of Fish, Wildlife, and Parks
- Jerry Dupler
- Department of Transportation
- Bob DeLange
- Department of State Lands
- Bill Fleiner †
- Mt. Sheriffs & Peace Off. Assoc.
- Jesse Y. Gonzalez †
- Billings 9-1-1
- Fred Guardiose
- Blackfoot Tribal EMS
- Don Houghton
- Gallatin Co. Sheriffs Office
- Jim Kraft
- Yellowstone County DES
- Charlie Larson †
- Montana Highway Patrol
- Franklin Mick Mills
- Lincoln County DES
- Rick Newby †
- Miles City Police Department
- Richard A. Nisbet †
- City of Helena
- Ray Nordhagen
- City of Missoula
- Douglas Pitt †
- Mt. State Fire Chiefs Association
- Chuck Rhodes †
- Flathead Co. Search and Rescue
- Clark Robinson
- Gallatin County
- John Skaggs
- Motorola
- Midge Warrington
- Cascade County 9-1-1
- Homer Young
- Mt. Disaster & Emergency Svcs. Div.
- † Member of Working Committee

Bill Jameson, Chairman
Montana State University

Dan Hawkins, Plan Coordinator
Department of Administration

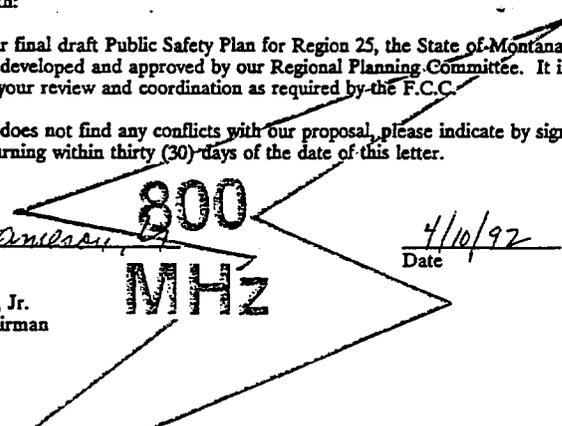
April 9, 1992

Bill Smith, Chairman
NPSPAC Region 46
Wyoming Highway Department - Communications
P.O. Box 1708
Cheyenne, WY 82002-9019

Dear Mr. Smith:

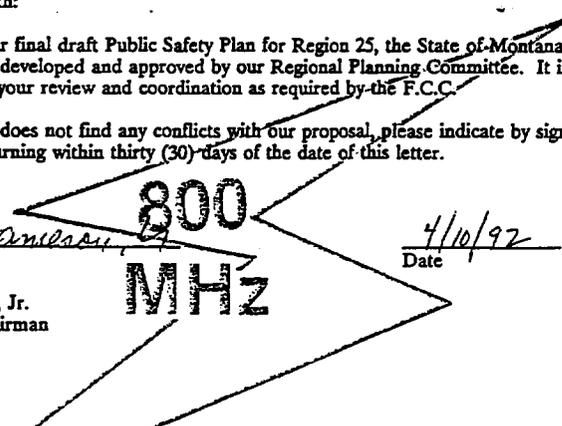
Enclosed is our final draft Public Safety Plan for Region 25, the State of Montana. This plan has been developed and approved by our Regional Planning Committee. It is submitted for your review and coordination as required by the F.C.C.

If your region does not find any conflicts with our proposal, please indicate by signing below and returning within thirty (30) days of the date of this letter.



 Signature W. J. Jameson, Jr. Date 4/10/92

Region 46 has reviewed and concurs with the Region 25 National Public Safety Plan.



 Signature William J. Smith Date 4/27/92

APPENDIX C

Adjacent Region Approvals (cont.)

National Public Safety Plan
FCC Region 25
Planning Committee

- Committee-at-Large
- Jim Adkins
Mt. Deaconess Medical Center
- Charles Aron, Jr. †
Columbus Hospital
- John Benson
West Yellowstone EMS/Fire
- Allen Bertapelle †
Mt. Private Ambulance Operators
- Bob Cardwell
General Electric
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EMS Bureau
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- Bill Fleiner †
Mt. Sheriffs & Peace Off. Assoc.
- Jesse Y. Gonzalez †
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Gallatin County
- John Skaggs
Motorola
- Widge Warrington
Cascade County 9-1-1
- Homer Young
Mt. Disaster & Emergency Svcs. Div.
- † Member of Working Committee

Bill Jameson, Chairman
Montana State University

Dan Hawkins, Plan Coordinator
Department of Administration

April 9, 1992

Lyle Gallagher, Chairman
NPSPAC Region 32
State Radio Communications
P.O. Box 5511
Bismark, ND 58502-5511



Dear Mr. Gallagher:

Enclosed is our final draft Public Safety Plan for Region 25, the State of Montana. This plan has been developed and approved by our Regional Planning Committee. It is submitted for your review and coordination as required by the F.C.C.

If your region does not find any conflicts with our proposal, please indicate by signing below and returning within thirty (30) days of the date of this letter.


 Signature 300 4/10/92
MHS Date

W. J. Jameson, Jr.
Region 25 Chairman

Region 32 has reviewed and concurs with the Region 25 National Public Safety Plan.


 Signature 5/9/92
Date

APPENDIX D

Glossary of Terms

Blocking - Blocking occurs when all channels are busy and any new transmissions, by either a dispatcher or mobile unit, are "blocked" by existing traffic. The probability of blocking, PB, is expressed as a decimal and is the probability that a new transmission cannot be accomplished due to existing traffic using all channels. It is a measure of the potential delay in obtaining a channel. PB is not a constant, but is (time) dependent upon the amount of radio traffic being carried by the system at any given time. For example, at hours of the day or week when there is a large volume of radio traffic, PB may be fairly large indicating a possible delay in completing a radio message.

Bouncing Busy Hour (BBH) - If one measures system traffic over a period of time (typically 30 days) and determines the amount of traffic in Erlangs during the busiest hour of the day for each day (the busy hour will "bounce" from day-to-day) during the measurement period, then the BBH traffic is the average over the period of the daily peak traffic.

Erlang - A measure of communications traffic. One Erlang represents one hour of traffic. Hence, if one has one Erlang offered uniformly to three channels, each channel would carry 1/3 Erlang.

Erlang C - A formula used to determine the grade of service (GOS) for communications systems in which calls are delayed rather than lost (such as occurs with a telephone busy signal). In a public safety radio system in which the user can monitor existing traffic, calls are delayed until the channel is free. Hence, Erlang C is an appropriate traffic formula for such systems.

Grade of Service (GOS) - The grade of service of a communications system is a measure of the probability, expressed as a decimal, that a communication path (channel) is available (i.e. not blocked by other traffic). It can be expressed as $GOS = 1 - PB$. Note that the GOS is not the percent of time the channel(s) is available for use. This is due to the fact that calls (eg. radio calls) arrive in a random order. At some times there may be a large number of calls for service contending for channels; at other times no calls for service. Channel availability is clearly lower when there are a large number of users waiting to be served; higher when there is little demand for service. The GOS is a "statistical averaging" of these conditions.

Peak Busy Hour (PBH) - If one measures system traffic over a period of time (typically 90 days) and determines the amount of traffic in Erlangs during the busiest hour of the entire measurement period, then the PBH traffic is the number of Erlangs of traffic during the busiest hour of the measurement period.

Time Consistent Busy Hour (TCBH) - If one measures system traffic over a period of time (typically 30 days) and determines the amount of traffic in Erlangs during the each hour of the day for each day during the measurement period, then the TCBH traffic is the maximum of the average of the traffic for each hour of the day over the period of the daily peak traffic. That is, one finds the hourly average traffic for the measurement period between 0000 and 0100 hours, between 0100 and 0200 hours, etc., through 2300 and 2400 hours. The TCBH traffic is the largest of these 24 averages.

APPENDIX E

Traffic Loading Study & Analysis

Address _____

Name of Communications Officer preparing this form: _____
Telephone number _____

List agencies served by the communications system:

Agency	# Mobile Units
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

How many 800 MHz channels serve the present system? _____
Are they trunked? Yes _____ No _____

What method did you choose to measure system traffic?
PBH _____ BBH _____ TCBH _____

How many days did you collect data in the study? _____

What method did you use?
Manual data collection _____
Automated data collection _____
What type of device was used to collect the data?

How many Erlangs of traffic were calculated:
a. Trunked system (total traffic, all channels) _____
b. Non-trunked system
Channel 1 _____
Channel 2 _____
Channel 3 _____
Channel 4 _____

APPENDIX F

Region 25 (Montana) CTCSS Tone Plan

Continuous Tone-Coded Squelch System (CTCSS) will be employed to protect Region 25 National Plan systems from co-channel and intermodulation interference.

Assignments

STATEWIDE - All radio equipment operating on 800 MHz frequencies under the Region 25 National Plan must be capable of using CTCSS 156.7 on the five International Common Channels.

<u>County</u>	<u>Hz</u>	<u>County</u>	<u>Hz</u>
Beaverhead	..... 146.2	McCone	..... 151.4
Big Horn	..... 107.2	Meagher	..... 107.2
Blaine	..... 114.8	Mineral	..... 156.7
Broadwater	..... 100.0	Missoula	..... 146.2
Carbon	..... 114.8	Musselshell	..... 131.8
Carter	..... 114.8	Park	..... 114.8
Cascade	..... 141.3	Petroleum	..... 100.0
Chouteau	..... 131.8	Phillips	..... 156.7
Custer	..... 167.9	Pondera	..... 100.0
Daniels	..... 141.3	Powder River	..... 156.7
Dawson	..... 146.2	Powell	..... 114.8
Deer Lodge	..... 107.2	Prairie	..... 156.7
Fallon	..... 100.0	Ravalli	..... 151.4
Fergus	..... 162.2	Richland	..... 114.8
Flathead	..... 123.0	Roosevelt	..... 131.8
Gallatin	..... 192.8	Rosebud	..... 151.4
Garfield	..... 162.2	Sanders	..... 162.2
Glacier	..... 107.2	Sheridan	..... 107.2
Golden Valley	..... 151.4	Silver Bow	..... 100.0
Granite	..... 141.3	Stillwater	..... 156.7
Hill	..... 107.2	Sweet Grass	..... 162.2
Jefferson	..... 156.7	Teton	..... 151.4
Judith Basin	..... 114.8	Toole	..... 162.2
Lake	..... 107.2	Treasure	..... 162.2
Lewis & Clark	..... 203.5	Valley	..... 162.2
Liberty	..... 156.7	Wheatland	..... 167.9
Lincoln	..... 151.4	Wibaux	..... 107.2
Madison	..... 167.9	Yellowstone	..... 146.2