Project Testimony of Tod Kasten
Dry Redwater Regional Water Authority (Dry-Redwater)
McCone, Garfield, Richland, Dawson, Prairie
County, Montana and a Portion of McKenzie County, North Dakota
In Support of SB637
A Bill to authorize the construction of the Dry-Redwater Regional Water Authority System in the State of Montana and a portion of McKenzie County, North Dakota, and for other purposes.

Madam Chair and members of the subcommittee, my name is Tod Kasten. I am Treasurer of the Dry-Redwater Regional Water Authority. Thank you for the opportunity to testify before the subcommittee in support of authorizing the Dry-Redwater Regional Water System. I would also like to thank Senator Max Baucus and Senator Jon Tester for their strong and continuing support for this project.

The Dry-Redwater will provide a safe and dependable municipal and rural water supply for the public water supply systems and rural users that comprise the Dry-Redwater Regional Water Authority. Speaking on behalf of the Dry-Redwater, I can assure you that our primarily agricultural based frontier communities in eastern Montana strongly support all components of the project as a good, clean, reliable source of water is vital to our existence.

This great local support is evidenced by over 3,100 good intention fees collected. These pre-paid fees show the financial commitment of the area users for this project. This financial support represents an equivalent population of nearly 7,000 users which is nearly 50% of the potential users already financially committed to this project.

Need for the Project:

The Dry-Redwater service area is plagued by problems with water quality and adequate supply. The public water supply systems within our boundaries are unable to meet the requirements of the Safe Drinking Water Act without expensive energy intensive treatment options. According to the Montana Department of Environmental Quality (DEQ), one of the public water supply systems who would be served by the proposed regional system is out of compliance with the Federal Clean Water Act due to levels of secondary contaminants – sodium and total dissolved solids.

Many of the existing systems treat their water with chlorine which in turn has caused problems with elevated levels of disinfection by-products. Other systems have problems with bacterial contamination and elevated levels of total dissolved solids, iron, manganese, lead, copper, sulfate and sodium that render the water nearly undrinkable.

The rural residents in the proposed project area currently obtain their water, in the majority of instances, from private wells drilled into shallow aquifers, gravel pockets or deep confined aquifers. Some rural residents are hauling all of their drinking and cooking water used either because their well water is undrinkable or there is not a

sufficient quantity to be usable. Many rural residents do report water quality and/or quantity problems, which is evidenced by the chart of private well water quality attached at the end of this testimony. There is a Montana Department of Transportation rest stop at Flowing Wells that is categorized as a public water supply system. This rest area is located at the junction of MT Highways 200 and 24; which is a main route to Fort Peck Lake. This rest area is heavily used by tourists and recreationist visiting Fort Peck Lake. The water source for this public area has signed for non-use as a potable system – do not drink the water due to high levels of nitrates and high levels of coliforms. This system has had to be renovated several times to correct those deficiencies, but due to the depth of the well and proximity to on-site sewage disposal facilities this will be a chronic problem.

The majority of the proposed communities to be served are currently operating their own municipal water systems; all of the communities are using wells as a source of water. Three communities must treat their water because of high levels of fluoride which is a health hazard and a regulated contaminant. A fourth community – Jordan – does not treat its water but it is high in sodium and total dissolved solids which are not currently regulated, but has detrimental effects on those drinking it. A fifth system – Fairview – has high organic levels in its water that has lead to a disinfection by product violation. The Town operates an iron and manganese removal water treatment facility that uses chlorine as the oxidizer; which while effective at removing the iron and manganese, does have the problem of forming disinfection byproducts.

Based upon preliminary review of the water quality in the wells of rural users in the proposed service area it indicated that the majority of them do not have access to the quality of water needed for a healthy existence. One of the wells, in the project area, serves Garfield County School District No. 15 and it shows that the sodium level is 447 parts per million (ppm) which exceeds the recommended level of 250 ppm, the fluoride is 3.35 ppm which exceeds the recommended level of 2 ppm and it has 1049 ppm of total dissolved solids which is over twice the recommended level of 500 ppm. This well and the other private wells are not regulated by National Drinking Water Standards but the detrimental effects of the water on their users are not any less because they are not regulated. The treatment of water in a private well is costly and sometimes complicated depending on what is in the water. A regional rural water system will allow the rural user to have access to a reliable, safe, high quality water supply. The public water systems in the service area are regulated by Drinking Water Standards and must treat the water they provide to their user to these standards. The use of a membrane type water treatment facility (reverse osmosis or nano-filtration) are not typical systems found in smaller towns, but due to the limited alternatives to remove the regulated contaminates (fluoride) Circle, Richey and Lambert were forced to use this energy intensive system that requires a high pressure pump to force the water through a membrane in order to remove the contaminates. The requirements for safe drinking water are getting more stringent every year and these increased regulations equal increased costs to all public water systems. A small system that currently treats their water such as Circle, Richey, Fairview and Lambert will be greatly impacted financially for even minor modifications needed to meet new drinking water treatment standards.

These costs will be in treatment, distribution and operator certification costs. The Town of Jordan currently does not treat its ground water source but does provide disinfection by means of chlorination. The Town of Jordan, like other public drinking water systems, must publish an annual drinking water report and following is an excerpt from the latest report: *"We're pleased to report that our drinking water is safe and meets federal and state requirements. However, as many of you know, although our water is labeled as safe to drink under the Safe Drinking Water Act, some of the unregulated parameters affect the taste and may affect the health of a limited population. The concerns are sodium and the total dissolved solids in the water. The sodium level is high enough that people with high blood pressure may want to consider a separate source of drinking water. The total dissolved solids are high enough to have a laxative effect on people that have not become conditioned to the water. We are aware of these problems with our source of drinking water, but have been unable to find a solution that is financially feasible."* The drinking water standards for sodium and total dissolved solids will be addressed in future regulations and the Town of Jordan will need to address these regulation changes and the costs that will be associated with meeting those new regulations. By belonging to a regional water system these small systems will be part of a larger user base, so future improvements will not have as great of financial impact to the individual user. In the proposed regional water system there is one source of water treatment which will replace 5 existing central water treatment systems. This will greatly reduce the costs, improve efficiency and effectiveness in the delivery of safe water to all area users.The installation of a single conventional water treatment plant will greatly reduce the energy consumption utilized in the treatment process since the 3 energy intensive reverse osmosis system will be retired. Another benefit of the regional water treatment facility is the reduced volume of wastewater generated during the treatment process. A reverse osmosis facility must reject 35% to 50% of the water that comes into it to remove the fluoride and sodium down to acceptable levels. This reject water must be stored and treated in the Town's wastewater system which in Richey, Circle and Lambert causes storage problems. A conventional water treatment plant will waste 5% to 10% of the incoming water to clean the filters of the contaminants removed during the treatment process. Unlike the waste stream from a reverse osmosis treatment facility that has high concentrations of sodium, fluoride and other deleterious chemicals the waste stream from the surface water plant can be placed in a settling pond and after a period of 2 to 3 weeks over 80% of the waste water could be reused for irrigation or stock watering. The landowner that is selling the land for the proposed water treatment facility has expressed a great interest in being able to utilize this water. A regional water system also mitigates the potential negative impacts of migration from one small community. For example, if 15 users leave Richey that is 10% of their user base, but if Richey joins the Dry-Redwater project and Richey loses 15 users; it is less than 1% of the total user base.

Town of Circle

The Town of Circle has a municipal water distribution system which consists of 2 deep (±1,500 ft) water wells, an elevated 50,000 gallon water storage tank, a 250,000 gallon on-ground water storage tank and a reverse osmosis water treatment plant with a

50,000 gallon clearwell. The Town has experienced heterotrophic bacterial growth in their wells that has required extensive rehabilitation work and replacement of one well. This bacterial growth is starting to build up on a second well and in several years will become problematic and will require replacement. This well screen problem is chronic and is on going. The current groundwater raw water supply is over the Maximum Contaminant Level (MCL) established in the Safe Drinking Water Act for fluoride and above the secondary limit for sodium. The Town of Circle must remove these contaminants and since conventional treatment processes won't remove fluoride they must utilize an energy intensive reverse osmosis treatment process. If the current treatment process has mechanical problems the Town would be forced to put water into the distribution system that is a documented health hazard. The Town of Circle will benefit in the long term by connecting to the Dry-Redwater. The uncertainty of the life of their wells, the cost to replace a well (over $150,000) and the cost to treat the water are all items that strengthen their commitment to this project.

Town of Jordan

The Town of Jordan has a municipal water distribution system which consists of 2 water wells and a 200,000 gallon on-ground water storage reservoir. There is no treatment of the water but it is disinfected by being chlorinated. The quality of the water exceeds many of the secondary limits, such as sodium and total dissolved solids, of the amendments to the 1996 Safe Drinking Water Act. The potential for increased regulation of the groundwater rule (GWR) and disinfection by products rule would cause an additional cost to each user in Jordan in order to be in compliance with the rule. The Town of Jordan will benefit from the Dry-Redwater project by having a water supply that is treated to the most current water quality standards and delivered at a consistent volume and pressure.

Town of Richey

The Town of Richey has a municipal water system that consists of two deep water wells (± 1400 ft), an on-ground 100,000 gallon steel water storage reservoir and a reverse osmosis water treatment facility. The raw water source for Richey is identical to Circle in that exceeds the MCL for fluoride and the secondary limits for sodium so that is why the Town of Richey also utilizes the energy intensive reverse osmosis treatment process. If the current treatment process has mechanical problems the Town would be forced to put water into the distribution system that is a documented health hazard. The water treatment facility reduces the levels of each contaminant to below the limits. The Town of Richey will benefit from inclusion in the Dry-Redwater project since its current raw water source is in violation of the drinking water standards if not treated and the current system has a fairly high cost to operate when compared with conventional treatment. The replacement costs of membranes and increased electrical costs in the future will also make connecting to the regional system more economical.

Lambert County Water and Sewer District

Lambert County Water and Sewer District has a central water distribution system. This unincorporated town has two deep water wells (± 1,200 ft), a 50,000 gallon on-ground steel water storage tank and a nano-filtration (membrane) water treatment facility. The water supply exceeds the MCL for fluoride and exceeds the secondary limit for sodium that is why the District utilizes an energy intensive nano-filtration treatment process. If the current treatment process has mechanical problems the Town would be forced to put water into the distribution system that is a documented health hazard. The District will benefit from connection to the Dry-Redwater for the same reasons as Circle and Richey.

Fairview

The Town of Fairview draws its water from two wells approximately 240 feet deep. The central distribution system has a 100,000 gallon elevated water storage tank and a 300,000 gallon on-ground steel water storage tank. The ground water source is high in tannins, lignens, iron and manganese. The Town utilizes an iron and manganese removal process and gas chlorine for disinfection. The Town has recently received a notice from the Montana Department of Water Quality that they had a test for haloacetic acids (HAAS) and total trihalomethanes (TTHMs) (disinfection by product contamination) that exceeded the limits set by the Safe Drinking Water Act. The Town is now studying and determining what changes in their disinfection process they need to make to meet the Disinfection by Products Rule. The high organic content of their raw water is a significant factor in the creation of the by products. The Town of Fairview will benefit greatly by receiving its water from the Dry-Redwater Regional Water Authority system.

New Rural Users– New users would include rural residents who have not had the opportunity to be connected to a high quality treated source of water as provided by a regional water system. These residents use individual wells for domestic and agricultural needs, haul water from other sources or purchase bottled water for drinking purposes. The water quality varies greatly throughout the project area but generally has levels exceeding the U.S. EPA Secondary Health Standards with high levels of total dissolved solids, hardness, sulfates, sodium, iron, manganese and areas of high fluoride. The majority of these wells are constructed in glacial till materials typical of the project area, resulting in wells which have varying abilities to provide a sufficient quantity and adequate quality of water supply. The cost to install new water well has been determined, based on information provided by NRCS, to be over $90 / month when you factor in the replacement cost of the various components of a well system. The box on the next page shows how this cost was determined:

Drill and case well: $35.00/ft average depth 200-250 ft Cost: $7,000-$8,750
If a well lasts 15 years the monthly cost is $39.00 to 48.00 per month.
Pump and Motor: $1,000.00 If a pump lasts 5 years the monthly cost is $16.70.
Control pit/pressure tank: $2,800 with a 15 years life has a monthly cost of $15.60.
Annual stock well electrical base rate is $240.00 per year or $20.00/month before electrical use.
The cost to run electricity to a new well site is $17,160.00/mile or $3.25/ft. This cost was provided by McCone Electric.
For a new well that already has electric service the monthly costs before any water is pumped is $91.30 to $100.30.

When you have bad groundwater to start with, treatment doesn't improve its quality, it only reduces some of the chemical components to meet regulation standards, and this does not necessary mean the water is free from taste and odors. Second, maintaining the individual systems does not address the benefits of providing a firm water supply that protects the communities against future drought. The individual user also relies on a well pump and small pressure tank to provide water, and when the power is out they lose the ability to access their domestic water source. The regional system will have storage tanks that will pressure the system and backup power systems.

From a regulatory aspect a regional water system has significant benefits. At the present time, there are six different regulated public water systems within the region that are part of the Authority. Meeting regulatory requirements of the Safe Drinking Water Act must be currently demonstrated by each system. When a rule changes, all those systems must react to the change individually. Many of the systems serve small municipalities or county water districts, some with fewer than 150 connections, there is a reduced capacity on their part to maintain and operate a water system. That means that the Montana Department of Environmental Quality is perennially facing problems with compliance issues in these smaller public water systems. A regional water system would provide one point of regulation for all of the member systems. If a rule were changed, it would only affect one treatment plant and due to economies of scale, a regional system can be upgraded and operated at a higher level of oversight and management at a smaller per user cost than smaller individual municipal water supply systems. An increased degree of compliance can be expected from a regional water system which further assures the water users of a safe and reliable source of water.

The Project:

The effort began in 2002 with a steering committee of volunteers, with the Dry-Redwater Regional Water Authority becoming a legal entity in 2005. The Dry-Redwater has enjoyed strong support from the local people and the State of Montana. Currently about 50% of the households in the area, which is in excess of 3,100 hookups, have already paid a 'good intention' fee to show their financial commitment. Over $59,000 of locally raised funds have been put toward the project and thousands of hours of volunteer

efforts have helped move the proposed regional water system forward. The State of Montana thru the Department of Natural Resources has committed $350,000 to the studies and organizational efforts of the project to date. The Montana Department of Commerce provided $40,000 of CDBG funds and the Federal Economic Development Administration provided $40,000 used to help pay for the completed feasibility study. This current investment of over $489,000 does not include the thousands of hours of volunteer time and effort.

The project as conceptualized will consist of 1,220 miles of pipeline, 38 pump stations and 20 major water storage reservoirs. It is projected to cost $115,116,000. By working together, the communities in the area can more efficiently provide affordable safe and reliable water to people in the project area. The water for this project will be obtained from the Dry Arm of Fort Peck Lake near Rock Creek. The water---approximately 3,500 acre feet, of the 18 million acre feet available---will be leased from the Corp of Engineers. The in-take and conventional treatment facility will be located at North Rock Creek on the Dry Arm of Fort Peck Lake. The process to find a location for the intake facility was done as a joint effort with the Corp of Engineers and the Charles M. Russell National Wildlife Refuge.

The feasibility study and addendum, completed in 2007, and as well as significant public participation in over 20 public meetings show that the need for safe and reliable water is a priority for the area's residents. The project is financially feasible given the funding packages used by the rural water systems in Montana and in comparison to rural water system costs in our three state region of Montana, South Dakota and North Dakota. The completed feasibility study includes preliminary engineering analysis of the system. The Dry-Redwater has also completed some preliminary cultural and environmental reviews. There are no fatal flaws found in these preliminary studies which included contacts with State, Federal and Local officials on NEPA compliance.

Proposed Rate Structure

	Bulk	Rural
Base	$24.50	$24.50
Water Treatment/Pump	$1.80 / 1000	$1.80 / 1000
Pipeline Maintenance	**	$1.21 / 1000

Proposed Financing Structure

	75%
Grant from Federal Government	$86,337,000
Grant from TSEP	$14,389,500
Loan Required	$14,389,500
Annual Debt Service (40 yrs, 4.5%)	$776,000
Annual Loan Reserve	$77,600
Annual Operation & Maintenance WTP / Booster Station	$710,000

Annual Operation & Maintenance / Pipelines	$212,000

Typical Monthly User Rate

		Study	
		8,000	**5,000**
Rural/City User	Base Rate (minimal)	$24.50	$24.50
	Water Treatment/Booster	$14.40	$9.00
	Pipeline Maintenance or Water Maintenance Fee	$9.68	$6.05
	Total Monthly Bill:	**$48.58**	**$39.55**

The median household income for the service area is $28,917 and using a 1.6% factor estimating a reasonable cost of water the average monthly rate is calculated at $38.55. The rates proposed for the Dry-Redwater shows that utilizing the typical rural water funding package the project is affordable to the users. The cost to the rural residents of $39 to $48 a month is significantly less than $90 to $100 for operating a rural well.

Dry-Redwater has been working closely with the Billings office of the Bureau of Reclamation (Reclamation) to move the project thru its brand new process as stipulated in the Rural Water Supply Act of 2006, and as expressed in the Interim Final Rules. However, given the investment made in time and money and the fact that the system's authorization bill was introduced by Senator Baucus in 2008 and again now as Senate Bill 637, it has been agreed by the Authority Board and other supporters of the regional concept that the project must move forward. In April 2009 Reclamation finally provided the Dry-Redwater a preliminary draft outline of the requirements for the Appraisal Investigation and Report under the Rural Water Supply Act of 2006. The Dry-Redwater Feasibility Study and addendum completed in 2007 will substantially satisfy the requirements of Appraisal and Investigation Report as provided by the Reclamation Billings office. The 2007 Feasibility Report is being reformatted into reclamations required format and will be submitted to them by the end of August. It has always been Dry-Redwater's intent to work with Reclamation to advance our project. Thus the request for Congressional Authorization of the project was considered the correct and timely process, as the system planning has reached a point beyond which it cannot easily move forward, without the ability to work formally with Reclamation, U.S. Fish and Wildlife and other federal agencies.

The Engineers that completed our study made the following finding in our feasibility efforts. "Based upon preliminary review of the water quality in the wells of rural users in the proposed service area it indicated that the majority of them do not have access to a quality of water needed for a healthy existence."

Many area residents are not served by any public water system. Due to the limited availability and poor quality of groundwater, these residents must haul their own water.

The available water supply fails to meet water quality standards and poses real health risks to the area's population.

By working together all of the communities in the area can better provide affordable good quality water to all of the people. Currently, the primary source of drinking water in our service area is groundwater. It is generally of very poor quality and quantity. The drinking water in most groundwater wells in the area exceeds the secondary standards and in some cases are four times the recommended EPA standards. Water quality problems are exacerbated by water supply issues and because of the general lack of good quality groundwater; most of the area's larger public water systems use expensive energy intensive treatment methods to produce clean water. The positive health benefits of good quality drinking water will without a doubt be a tremendous benefit to the area citizens and to the overall economy of the region.

Economic Benefits

A dependable supply of water is essential to ongoing efforts to attract new businesses and people to this primarily agricultural based frontier area of Montana in order to provide for future economic growth. In addition to long term benefits, the regional water project will provide an immediate economic boost for eastern Montana. Assuming labor costs for the project at 25 percent of the total construction budget, the project will generate approximately $30 million in wages. These construction dollars will provide a much needed stimulus to the regional economy of McCone, Garfield, Dawson, Richland, Prairie Counties and the statewide economy.

The Dry-Redwater's service area has many natural resources that could be developed to help the United States become more self reliant when it comes to energy. The area has tremendous resources in water, ground to grow crops for bio-fuels, one of the nation's largest on shore oil reserves in the Bakken Formation Oil Field, the largest lignite coal reserve in the United States and a huge potential for wind farm development. There are a number of energy related projects that have been and are proposed within the Dry-Redwater service territory. An example is a nationally important oil transmission pipeline known as the TransCanada Keystone XL project will pass through the area. A good source of safe and reliable water supply is critical infrastructure to support the development of any of these nationally important energy sources.

The regional pipeline will provide one of the key resources that enterprising businesses and people look for when they locate in an area – a safe water supply. Ranch/farm operations will benefit from the stock water available through the system. This will immediately improve their bottom line, as increased weight gain can be achieved with higher quality water. Efforts to diversify the agriculturally based economy with tourism, wildlife enhancement, hunting, fishing, dinosaur discoveries, outdoor recreation has been somewhat successful but a high quality water source will help its development to improve recreation facilities owned by the COE, the State of Montana and the counties of the Dry-Redwater Service area. This project will not resolve all of the economic

problems that eastern Montana faces; however, it will serve as a cornerstone to future success upon which the people in the area can build.

Finally and perhaps most importantly, we believe the health benefits of safe water will help save the citizens by reducing water related medical problems and thus decreasing medical costs. A rural resident L. Taylor from McCone County stated "that her doctor told her not to drink their water as they attributed their well water to her numerous bladder infections".

Alternate Sources

The Dry-Redwater Regional Water Authority has studied possible alternatives to supply water to the region. The option of updating the six existing public water supply systems to comply with the Safe Drinking Water Act was rejected due to the high cost and multiple water sources to test and monitor. The use of additional groundwater sources was also investigated. This option was not feasible because there is very little groundwater physically available in the quantity needed, and the groundwater that is available is of very poor quality and would require an expensive treatment process. Of all the alternatives reviewed, the proposed regional water project found that utilizing the high quality surface water found in the upper Missouri River basin proved to be the best. The water impounded in Fort Peck Lake provides a very dependable water supply while offering the lowest capital project and life-cycle costs to treat and deliver water to the end user. The cooperative efforts of the USACOE staff at Fort Peck and the staff of the CMRNWR provided an excellent location for the intake structure that is in a deep water portion of the lake and will have minimal impacts on the wildlife found in the refuge.

A water treatment plant, using conventional filtration, will be located near the intake in the Dry Arm of Fort Peck Lake near North Rock Creek. The water will be treated to meet both the primary and secondary requirements of the Safe Drinking Water Act standards. A series of transmission pipelines will provide water to smaller distribution lines belonging to the area's public water supply systems and to the rural users. The regional water system will take advantage of the infrastructure of the existing distribution systems. When completed, the regional water system will provide a safe and dependable water supply for over 15,000 people. Water will be provided to all or parts of six counties which includes an 11,100 square mile area.

Without the proposed centralized water treatment plant, most of the participating systems would be required to build new or to significantly upgrade existing high energy use, water treatment plants as the Safe Drinking Water Standards are made more stringent. The low population densities and limited income potential in eastern Montana, individual communities will not be able to afford own and operate their own water treatment plants. A central water treatment plant will allow these existing systems to economically meet both the current and future requirements of the Safe Drinking Water Act and continue to provide their users with safe, reliable and affordable water.

The estimated total project cost is $115.1 million. The Bill proposes the federal share of the construction to be 75 percent. The Dry-Redwater Regional Water Authority will be responsible for the cost of operating, maintaining and repairing the overall system.

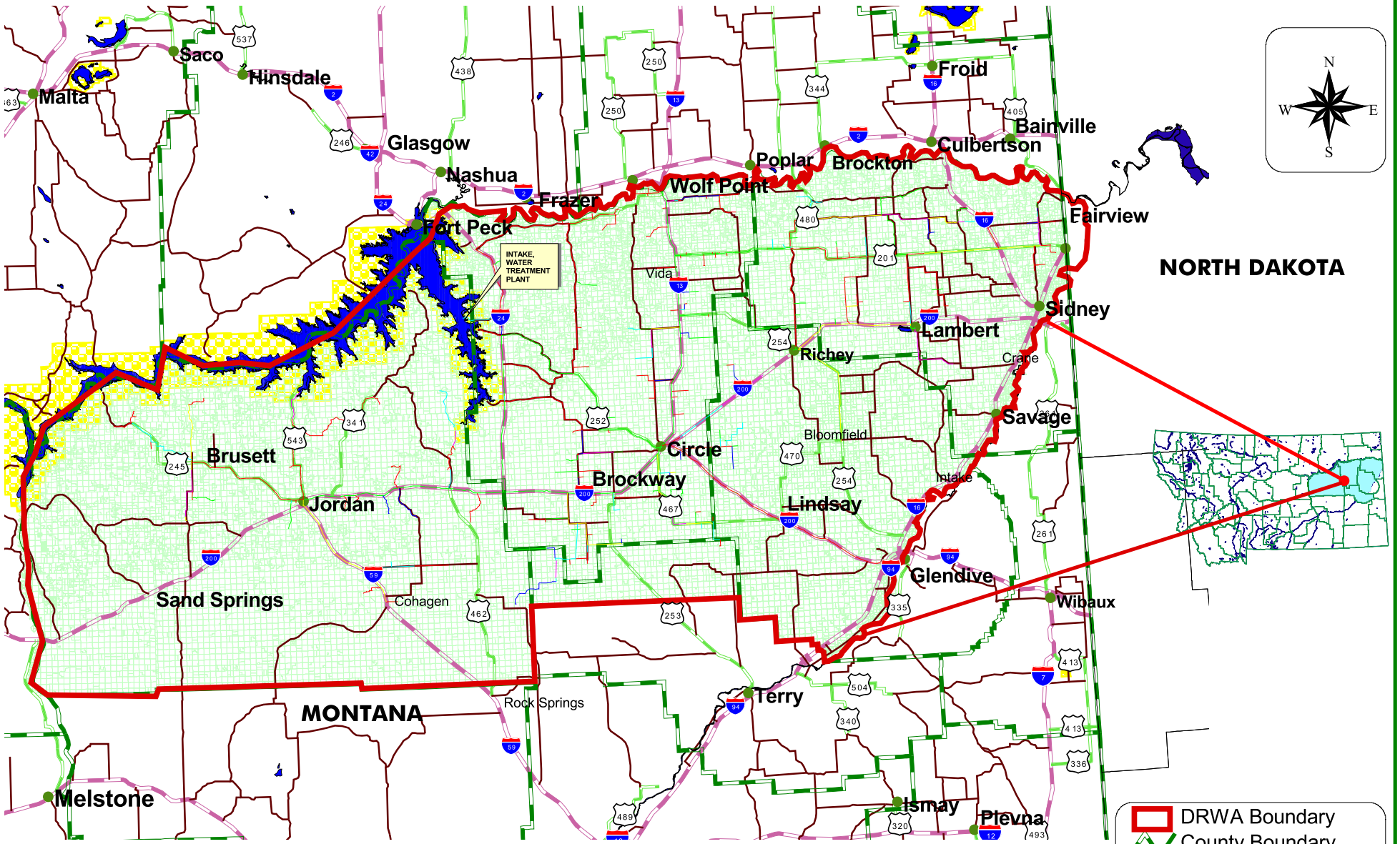
There are distinct benefits of a regional water system:

- ✓ Communities will not absorb the costs of upgrading numerous smaller water facilities to keep up with water quality standards.
- ✓ A greater number of regional system users helps defray the cost of good water for every individual in the area.
- ✓ This system will provide jobs, not only during construction, but also for ongoing operation and maintenance.
- ✓ Economic and community development opportunities with the ability to attract businesses and people that need a reliable water source are greatly enhanced.
- ✓ Total water and energy consumption by all communities will be substantially less than if each community provides water treatment.
- ✓ A dependable, high-quality drinking water sources provides an incentive for business and industry to consider relocation to eastern Montana.
- ✓ Reduction in chemical usage and cost as a result of increased crop spraying efficiency.
- ✓ Rural area fire protection capacity
- ✓ Increased property values
- ✓ An alternative water sources for livestock.
- ✓ Safe and reliable household drinking water to improve the health and existence of the people.

Many people in eastern Montana presently do not have a reliable source of high quality water. The proposed regional water system will provide water to an area historically afflicted by water supply and quality problems. The positive health benefits of safe household drinking water is critical to the well being of the people of eastern Montana and will provide the required infrastructure for the regions' and State's economy. We ask this subcommittee's support in passing this important legislation to protect the health, social and economic future of our region.

Thank you again for the opportunity to testify in support of the Dry-Redwater Regional Water Authority. I would be pleased to answer any questions.

DRY-REDWATER



INTERSTATE ENGINEERING

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Table 2.3.2

Water Quality of a Small Sampling of Wells Currently Being Used in McCone & Garfield Counties

Well Site Name	County	Depth	Sodium 250	Sulfate 250	Fluoride 2.0	TDS 500
73 RANCH	Garfield	1,003.0	1,524.00	2,464.00	2.80	4,577.17
JORDON JOHN	Garfield	280.0	667.00	793.00	1.00	1,885.00
CLAUSON WILLIAM	Garfield	300.0	502.00	391.00	1.00	1,330.18
73 RANCH	Garfield	1,003.0	1,484.00	2,346.00	<5.0	4,362.31
GARFIELD CO SCHOOL DIS #15	Garfield	350.0	447.00	33.80	3.35	1,048.79
BIG DRY SCHOOL HOUSE	Garfield	700.0	625.00	916.00	<0.5	1,788.81
MCKERLICK JOHN	Garfield	80.0	586.00	627.80	2.00	1,603.38
BURGESS RANCH	Garfield	365.0	670.00	681.00	1.00	1,806.43
BAKER JIM	Garfield	390.0	979.00	1,241.00	1.00	2,780.48
HOVERSON SARAH	Garfield	370.0	1,062.00	1,210.00	1.50	2,996.94
HAFLA JOE	Garfield	258.0	544.00	657.00	0.10	1,733.50
PLUHAR PHILLIP	Garfield	255.0	460.00	424.00	0.30	1,259.24
KEEBLER DEAN	Garfield	600.0	592.00	748.00	1.40	1,671.91
LANDERS H	Garfield	380.0	587.00	764.00	1.10	1,688.92
CITY OF CIRCLE	McCone	1,624.0	412.00	<25.0	4.31	1,002.02
CITY OF CIRCLE * WELL NO. 1	McCone	150.0	775.00	1,059.00	2.55	2,317.44
CITY OF CIRCLE	McCone	1,508.0	400.00	<0.1	5.20	1,004.81
CITY OF CIRCLE	McCone	1,508.0	472.20	<2.5	5.10	1,109.19
PRAIRIE ELK SCHOOL	McCone	200.0	1,891.00	2,055.00	0.95	5,303.20
DREYER RAY	McCone	189.0	820.00	1,229.00	0.80	2,537.42
WHITMUS FRANK	McCone	101.0	975.00	1,350.00	1.18	2,964.94
WHITMUS FRANK	McCone	640.0	476.00	3.40	5.50	1,129.85
WHITMUS FRANK	McCone	640.0	473.00	<25.0	5.96	1,123.78
WHITMUS FRANK	McCone	640.0	456.00	<2.5	6.67	1,101.34
WHITMUS FRANK	McCone	101.0	426.00	7.40	0.06	1,049.21
WALLER G.	McCone	240.0	520.00	837.70	0.10	2,044.70
MERRY HERSCHEL	McCone	260.0	700.00	887.80	2.70	1,967.40
KJELGAARD HAROLD	McCone	220.0	1,340.00	1,345.00	1.90	3,701.16
FLATTEN CLINTON	McCone	175.0	736.00	660.00	4.07	2,033.71
WAGNER R.	McCone	85.0	92.00	667.20	0.10	1,405.10
ZAHN DONALD	McCone	20.2	230.00	1,705.70	0.20	2,630.97
ZAHN DONALD	McCone	49.9	532.50	2,125.80	0.20	3,604.34
UNKNOWN - 19.4 MI SW WELDON	McCone	?	2,300.00	3,700.00	NR	8,128.32
PAWLOWSKI W.	McCone	37.4	193.00	522.20	0.40	1,107.56
SEXTON WALLACE	McCone	75.0	1,015.00	4,830.00	1.12	7,144.25
MUELLER ARNOLD	McCone	203.0	626.00	205.00	5.20	1,527.93

Well Site Name	County	Depth	Sodium	Sulfate	Fluoride	TDS
UNKNOWN – 10 MI S PRAIRIE ELK	McCone	?	4,400.00	5,000.00	NR	13,717.39
FILLWORTH R CIRCLE MT 20 MI	McCone	201.0	1,127.50	2,016.60	0.60	3,844.26
TWITCHELL JOHN	McCone	89.0	810.00	1,319.50	NR	2,675.14
DREYER RAY	McCone	17.0	1,116.00	3,171.90	0.50	5,320.63
PAINE EDWARD	McCone	123.0	1,230.00	1,659.50	1.00	3,591.35
HUSEBY D.	McCone	20.0	445.00	673.00	0.30	1,701.37
PAWLOWSKI OTTO	McCone	276.0	574.00	1,014.90	NR	2,237.45
JAMES MATTHEW	McCone	109.0	584.00	344.00	1.00	1,562.91
SHEFELBINE ORVILLE	McCone	307.0	977.00	1,511.00	0.20	3,188.91
SHEFELBINE ORVILLE	McCone	67.0	897.00	1,528.00	0.55	2,962.21
GASS MILTON	McCone	268.0	1,470.00	1,794.00	0.70	4,178.61
WRIGHT STEWART	McCone	365.0	954.00	947.00	2.20	2,619.10
GIBBS DAVID	McCone	210.0	825.00	1,068.20	2.30	2,349.54
HERZBERG JOHN	McCone	215.0	776.00	624.00	1.10	2,067.03
NEFZGER DEAN	McCone	175.0	1,083.00	1,245.00	2.00	3,150.22
GULDBERG	McCone	65.0	234.00	1,610.00	2.10	2,813.50

Meets Standards
Exceeds Standards
Over 4 Times Standard

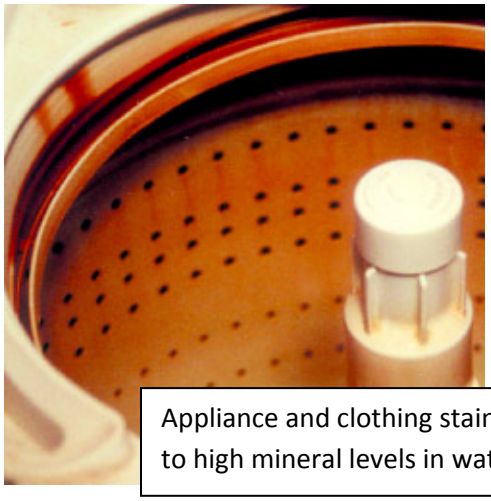
Typical Eastern Montana Rural residence water well and pressure tank delivery system

Well Head heavily corroded

Pressure Tank and piping corroded must replace every 5 to 7 years

Pressure tank and well in crawl space below house—confined space issues---access issues

Fixture corrosion due to aggressive water.



Appliance and clothing staining due to high mineral levels in water.

Mineral build up in stock watering tanks due high total dissolved solids in well water

Rural School water supply system and water samples from Fairview and Lambert water systems

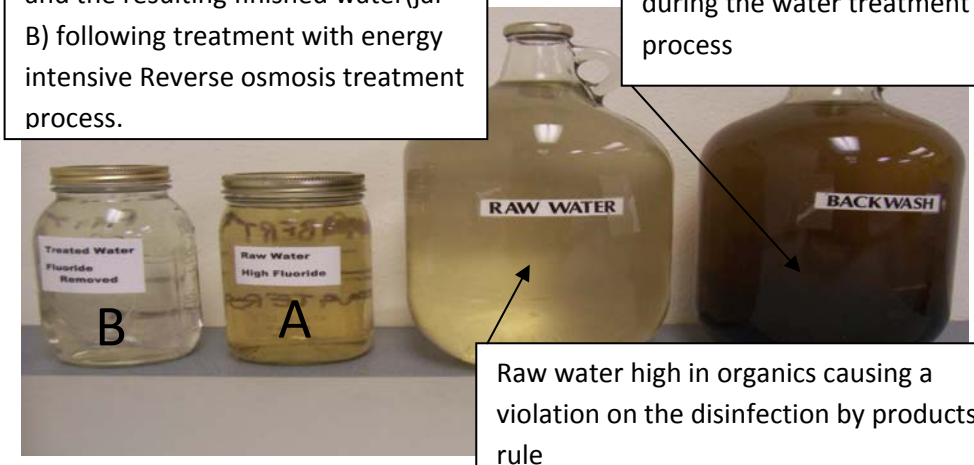
Building Housing the well, pressure tanks and disinfection system

Disinfection system

Well head and pressure tanks, a power outage of 10 minutes and the School is out of water—they have had an Administrative Order to address the lead and copper Rule levels due to corrosive water

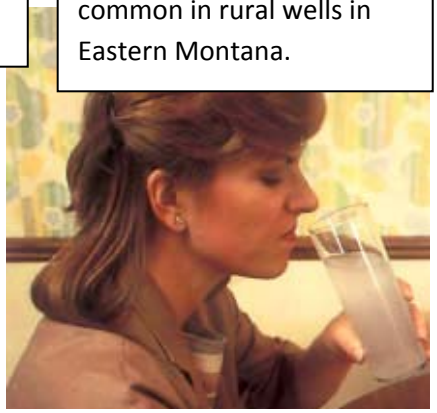
Raw water (jar A) high in Fluoride and the resulting finished water(jar B) following treatment with energy intensive Reverse osmosis treatment process.

Materials removed from water during the water treatment process



Raw water high in organics causing a violation on the disinfection by products rule

Water high in sulfates and dissolved solids has a very bad odor but is very common in rural wells in Eastern Montana.



DeLORME

XMap® 4.5

MN (0.0° W)

0 600 1200 1800 2400 3000 3600 ft

Data Zoom 13-0