



United States Department of the Interior

BUREAU OF RECLAMATION

Great Plains Region

Montana Area Office

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IN REPLY REFER TO:

MT-755

PRJ-28.00

MEMORANDUM

To: Regional Director
Attn: GP-4300 (BCole)

From: Brent C Esplin
Area Manager

Subject: Central Montana Regional Water System's Musselshell-Judith Rural Water System-Reclamation Feasibility Report (July 2015 Revision)

Attached is the final revision of the Central Montana Regional Water System's (CMRWA) *Musselshell-Judith Rural Water System-Reclamation Feasibility Report* identified as revised July 2015. The Feasibility Report was revised and updated in response to comments received from Reclamation's Technical Service Center policy experts.

The Reclamation Feasibility Report was also revised to include updated cost information from the *Appendix 14-Economic and Financial Analysis of the Proposed Musselshell-Judith Rural Water System*, revised December 18, 2014. This revised appendix will replace the current version (August 8, 2014) included in the CMRWA Feasibility Study and Report. The changes between the two economic analyses are minor and are summarized in the attached addendum titled; *Central Montana Regional Water System, Addendum to Final Feasibility Report: Musselshell Judith Rural Water System Economic and Financial Analysis -Revised December 18, 2014*.

Please update your copy of the CMRWA Feasibility Study and Report with the attached:

- *Appendix 14-Revised December 18, 2014*, and
- *Addendum to Final Feasibility Report: Musselshell Judith Rural Water System Economic and Financial Analysis -Revised December 18, 2014*-dated July 24, 2015.

One copy of the final Musselshell Judith Rural Water System Reclamation Feasibility Report is attached.

Please contact Gerald Benock, Manager Planning and Project Development Division, at 406-247-7331 or gbenock@usbr.gov if you have any questions.

Attachment

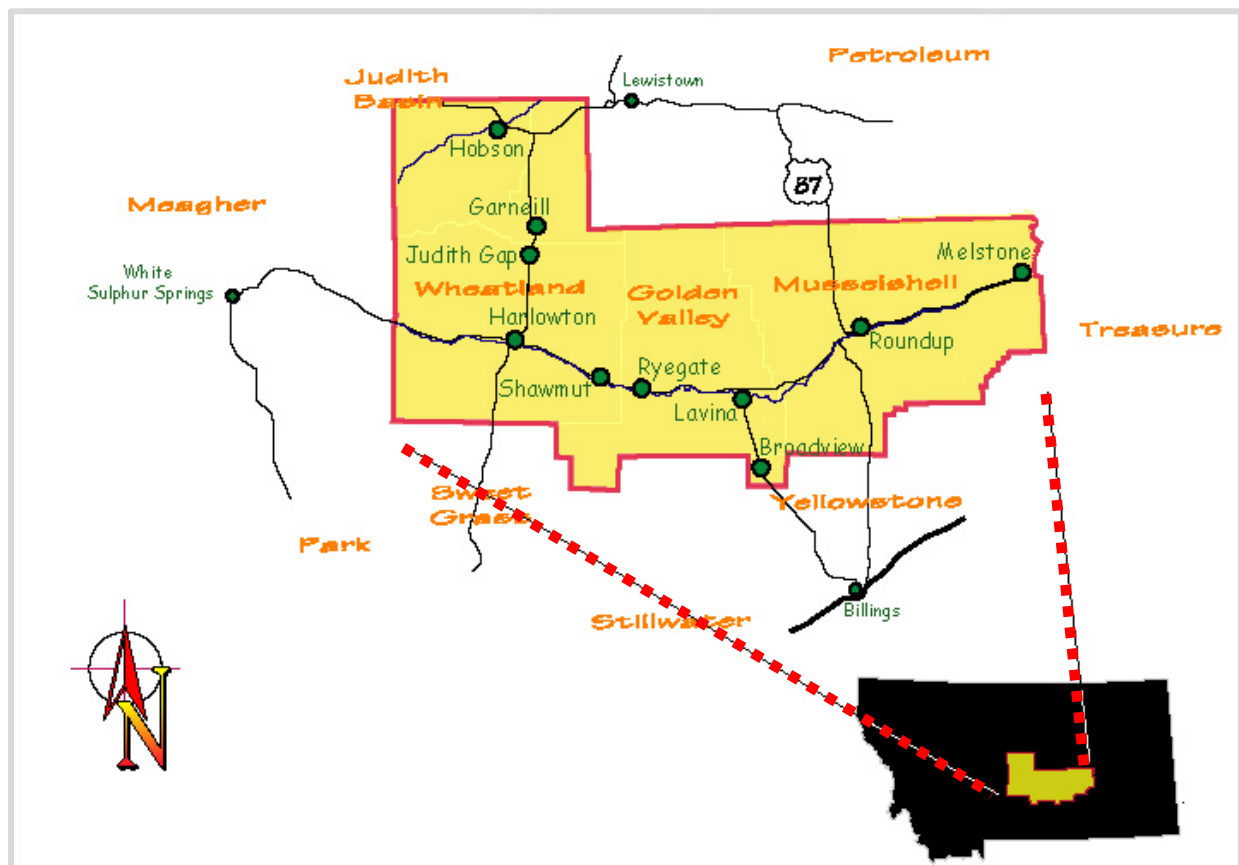
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RECLAMATION

Managing Water in the West

Musselshell Judith Rural Water System Reclamation Feasibility Report

Rural Water Supply Program
Montana Area Office, Great Plains Region



U.S. Department of the Interior
Bureau of Reclamation

March 2015
Revised July 2015

Mission Statements

The U.S. Department of the Interior protects America's natural resources and heritage, honors our cultures and tribal communities, and supplies the energy to power our future.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Musselshell Judith Rural Water System Reclamation Feasibility Report

Rural Water Supply Program Montana Area Office, Great Plains Region

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Acronyms and Abbreviations

af	acre-feet
afy	acre-feet per year
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CMRWA	Central Montana Regional Water Authority
D&S	Directives and Standards
DEQ	Montana Department of Environmental Quality
DNRC	Montana Department of Natural Resources
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAQ	Frequently Asked Questions
gpcd	gallons per capita per day
gpm	gallons per minute
kW	kilowatt
LT2 Rule	Long Term 2 Enhanced Surface Water Treatment Rule
MCA	Montana Code Annotated
MCL	maximum contaminant levels
mg/L	milligrams per liter
MJRWS	Musselshell Judith Rural Water System
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
O&M	operations and maintenance
P & G's	Principles and Guidelines for Water and Related Land Implementation Studies (Water Resources Council, 1983)
P.L.	Public Law
PRV	pressure reducing valve
Reclamation	Bureau of Reclamation
RTU	remote terminal unit
RWSP	Rural Water Supply Program
Rule	Rural Water Supply Program interim final rule, CFR 404
SCADA	supervisory control and data acquisition
TDS	total dissolved solids
TSC	Technical Service Center
USC	United States Code

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Chapter 1. Introduction

About this Feasibility Report

The Bureau of Reclamation's (Reclamation) Rural Water Supply Program (RWSP) addresses rural water needs in the Reclamation States. The Central Montana Regional Water Authority (CMRWA) has submitted a feasibility study entitled *Musselshell Judith Rural Water System, Feasibility Study Report/Environmental Assessment* (CMRWA 2014) for consideration under this program.

Reclamation's Montana Area Office and the Technical Service Center (TSC), as appropriate, prepared this feasibility report to summarize and review the CMRWA Feasibility Study as required under Title I Section 103 of the Reclamation Rural Water Supply Act of 2006 and Interim Final Rule Code of Federal Regulations (CFR) (43 CFR Part 404) (Rule).

This report was developed for Reclamation (Great Plains Region) to support a recommendation to Congress "regarding whether or not the proposed rural water supply project should be authorized for construction, and the reasons supporting the recommendation. This recommendation will be based on Reclamation's review of the CMRWA Feasibility Study and its application of the criteria set forth in Rule §404.49" (§404.50.b). At appropriate points in this feasibility report, call out boxes summarize Reclamation's findings regarding the particular topic.

This report provides the appropriate context for Reclamation's findings and recommendations and summarizes these findings for eligibility, need, alternatives, and recommendations. It combines environmental and planning requirements as specified in the Council of Environmental Quality (CEQ) 40 Frequently Asked Questions (FAQ) Number 21, Combining Environmental and Planning Documents.



Overall Technical Findings

Reclamation's finds that the proposed project and study:

- Meets the requirements set forth in Reclamation's Directives and Standards (D&S) CMP 05-02, Feasibility Studies.
<<http://www.usbr.gov/recman/cmp/cmp05-02.pdf>>.
- Meets the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (Principles and Guidelines). (Rule §404.49.d.8)
- Meets the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), National Historic Preservation Act (NHPA), and other related environmental and cultural resource laws.
- Demonstrates that this project is a viable solution to long term water supply issues; however, given existing constraints on program resources, Reclamation does not recommend the authorization of Federal assistance at this time.

Overall Feasibility Study Purpose

The CMRWA Feasibility Study addresses rural water improvements for communities and rural users in Central Montana (see CMRWA 2014, Section 1.2, Project and Scope).

Feasibility Study and Report Authority

The CMRWA Feasibility Study and this Reclamation Feasibility Report were conducted under the authority of the Rural Water Supply Act of 2006 (Title I, Public Law [PL] 109-451; 120 Stat. 3346; 43 United States Code [USC] 2401 et seq, and 43 CFR Part 404).

Project Sponsor, Partners, and Other Participants

CMWRA is comprised of small communities within the service area. The CMRWA is a legally created public water authority in the State of Montana under Title 75, Chapter 6, Part 3, Montana Code Annotated (MCA), the Regional Water and Wastewater Act. They held regular board meetings as well as additional public meetings while developing this project (see CMRWA 2014, Chapter 1. Introduction for a list of members and Section 1.3 for a description).

No Indian Tribes are involved.

Project Location and Description

The vast proposed project area extends across Judith Basin, Fergus, Wheatland, Golden Valley, Musselshell, and Yellowstone Counties in central Montana. These six counties are sparsely populated, covering 13,310 square miles of land with a population density of 0.08 people per square mile. The proposed service area encompasses seven incorporated communities and many unincorporated areas (see CMRWA 2014, Section 1.4 Description of Project Area). Towns in or next to the project area are: Harlowton, Judith Gap, Garneill, Buffalo, Utica, Hobson, Rothermay, Lavina, Broadview, Roundup, Musselshell, and Melstone.

The western and central portions of the study area contain most of the rivers and drainages, while the eastern portion is considerably more arid. The predominant land use within the MJRWS project area is agriculture, both farming and ranching. (3.4.1). The area is a semi-arid, rolling plain, primarily used for rangeland.

The proposed Musselshell Judith Regional Water System (MJRWS) encompasses the counties of Judith Basin, Wheatland, Golden Valley and Musselshell. The water resources consist of:

- **Surface water:** the Judith River drainage and the Musselshell River drainage. Both drainages consist of multiple tributaries that flow into the Judith River and Musselshell River, which then flows into the Missouri River.
- **Groundwater:** wells drilled into the Judith River, Eagle Sandstone, Fort Union, Claggett Shale or Alluvium and Basal Kootenai Formations. The MJRWS well field would be drilled into the Madison Aquifer, which has not been developed except for the Big Spring south of Lewiston and the Warm Spring and Hanover Well northwest of Lewiston. The CMRWA has drilled into the Madison Aquifer twice (i.e., the Utica and Ubet test wells).

Planning Scope and Horizon

Population, water use, and cost estimates have all been updated to reflect an anticipated construction start date of 2015 and a 50-year project life (to 2065) (see CMRWA 2014, Executive Summary, Section I.vi and Section 2.1. Population Estimates).

Regional or Watershed Approach

As the MJRWS will serve a large portion of the Musselshell drainage as well as a portion of the Judith basin to meet the drinking water needs of residents in this large area, it is a regional and watershed-based approach (see CMRWA 2014, Executive Summary, Section I.vi).



- **Regional or Watershed Approach.** Reclamation finds that the study incorporates a regional or watershed approach as specified under P.L. 109-541 §105.c.1.F, Rule §404.13.a.2.b and §404.44.c.5, and D&S 10.B.4.b.viii and 12.C.1.d.

Chapter 2 - Problems, Needs, and Opportunities

General

Rural users in these areas currently haul water or rely on inadequate water groundwater wells. The communities within the region that would ultimately be served by the MJRWS currently operate and maintain existing small water systems that serve each individual municipality. They currently depend on poor quality ground water or the acutely drought-sensitive and dwindling surface water resources within the region. Other water needs in the area include:

- Existing surface water sources are limited, susceptible to drought conditions and there is limited availability for water rights.
- Difficulty in treating the river water to meet the recent Long Term 2 Enhanced Surface Water Treatment Rule (LT2 Rule) as put forth by the U.S. Environmental Protection Agency (EPA) makes it very costly to use the river as a surface water source.
- The very poor quality of groundwater in the Musselshell region and the dwindling quantity make it difficult to use groundwater in the Musselshell Valley. Existing groundwater sources are of poor quality and do not meet secondary maximum contaminant levels (MCL).
- On-site water treatment of poor quality water does not address the issue of water quantity that exists in many communities within the service area.

Local, specific needs are briefly discussed in the following subsections. See CMWRA Appendix 8: Appraisal Report, Section 1.3, Description of Existing Facilities, and Section 3.1. Problems. Also see Appendix 3: Environmental Assessment (EA), Section 1.2 Purpose and Need. Examples of drinking water challenges currently faced by CMWRA members include:

Chapter 2 - Problems, Needs, and Opportunities

- The City of Roundup obtains its water from a coal mine, and the water is so mineralized that it is nearly undrinkable. Almost all residents buy bottled water and/or use costly in-home reverse osmosis units. In addition, residents are forced to operate water softeners because the water is so corrosive to appliances.
- The Town of Melstone has nearly run out of water several times in the last decade as flows in the Musselshell River approached zero. Further, the Town's aging surface water treatment plant is becoming increasingly inadequate at treating water to meet recent regulatory actions (i.e., LT2 RULE). More recently they've constructed two new production wells; however, both exceed the secondary standard for total dissolved solids (TDS). Additionally there are iron bacteria in the wells which require ongoing maintenance for the life of the wells as it cannot be completely eliminated.
- The Town of Ryegate has been forced to implement water rationing in the recent past during severe drought conditions where low flows in the Musselshell River significantly reduced the capacity of their infiltration gallery. The Town's emergency source, a moderately deep groundwater well, has a very low yield and can supply less than half of the current average system demand. The town uses an infiltration gallery from the banks of Musselshell River. The Montana Department of Environmental Quality (DEQ) has repeatedly questioned whether the water supply is "Groundwater Under the Direct Influence of Surface Water". If the DEQ determines that the source is under the influence of surface water, the town will need to install expensive water treatment facilities.
- The Town of Broadview operates on two deep low production and poor quality wells. If either well were to go out of service, the Town would not be able to meet the average day flow needs of the community which is a significant public health and safety threat to the residents. Broadview's water is also very corrosive, which causes frequent failures with pump and pump column assembly. These replacements are needed frequently and due to the extreme depth of the wells are very costly.
- The town of Lavina does not have a central water distribution system. Instead users throughout the community are served by private groundwater wells. There are three public water systems in the community that serve single buildings, namely the school, the Lavina Crossing Café and the Cozy Corner Bar. Water quality is exceedingly poor in Lavina. Groundwater produced by local wells is accompanied by high concentrations of total dissolved solids, sulfates, and nitrates. Not only do these contaminants impart a very poor aesthetic quality to the source water but nitrates also pose a threat to public health and safety, especially to infants younger than six months. Individual drinking water wells in Lavina are plagued with high nitrates, TDS, and sulfates.
- The Town of Harlowton has wells with high sulfate content that make the water very difficult to drink without treatment. Harlowton also has one well that recently began producing high levels of black silt from the aquifer that has forced the town to shut this well down. Without this well, the town cannot meet peak summer demands of the system.
- The town of Hobson does not have a central water distribution system; rather, the town is served by a fill station that is replenished by a groundwater well. Residents and several transient non-community public water systems that serve well-trafficked enterprises within the community draw water from a shallow aquifer with a consistently high concentration of nitrates and coliforms. Water quality of these water systems is

commonly poor, caused in part by the high concentration of nitrates in the groundwater present in all of the systems, with the exception of the Hobson School. Nitrates are frequently detected at over 50 percent of the MCL of 10 milligrams per liter (mg/L) stipulated in the National Primary Drinking Water Standards, which requires that the systems be monitored quarterly. On several occasions, the MCL for nitrate has been exceeded.

(See CMRWA 2014, Chapter 2: Problems and Needs)



- **Urgent and Compelling Need.** Reclamation finds that there is an urgent and compelling need as specified under P.L. 109-541 §103.d.2, Rule §404.13.a and §404.44.c.3, D&S 7.A and D&S 12.C.3.
- **Unsustainable or Inadequate Supply.** Reclamation finds that the inventory and forecast of critical resources showed that an unsatisfied water need exists or could be expected to occur as specified under P.L. 109-541 §105.c.1.B, Rule §404.44.c.1, and D&S 10.B.2.d.

Public Health and Safety

Important public health and safety issues that this project will address include:

- **Sustainable water supplies.** Severe drinking water issues faced by the citizens in this region. For example, if either of the two wells that the Town of Broadview depends on where to go out of service, the town would not be able to meet the average day flow needs of the community—a significant public health and safety threat to residents.

Recent drought conditions have caused the Musselshell River to dry up for periods exceeding one month at several communities during the period of 2001 through 2004. In addition, well levels in the region have dropped during the same period.

Rural residents lack sufficient quantity of water to support livestock, and poor quality of water for home use.

- **Water quality.** Issues such as high concentrations of total dissolved solids and sulfates pose health risks. Concentrations of TDS, iron, manganese, and sulfate present in the source water all far exceed the national secondary drinking water regulations established by the EPA.



A recent hydrant flushing shows the quality of water in Roundup, Montana. The City currently provides disinfection as a sole source of treatment. Disinfection is provided by chlorine gas.(CMWRA 2014 Appendix 8: Appraisal Report page 12).

(See CMRWA 2014, Chapter 2: Problems and Needs).



Public Health and Safety. Reclamation finds the sponsor's analysis of public health and safety is technically adequate at the feasibility level as specified under P.L. 109-451.106.c. 2, Rule 404.49.d.2, and D&S 12.C.3.b.

Water Demands

As populations increase, regional demand will steadily increase throughout the planning period with an estimated average day demand of 775 gallons per minute (gpm) in 2065, representing a 25 percent increase in consumption over the 50-year term, even while reducing per capita demands. Table 1 summarizes population and water demand estimates for the beginning and end of the planning period (see CMRWA 2014, Executive Summary and Section 2.2 Water Usage Projections and Conservation).

The MJRWS will serve an estimated population of 7,287 people by 2065 assuming a 50 year planning period. The estimated water use for the population is 153 gallons per capita per day (gpcd) or an average day flow rate of 775 gpm. A peaking factor of 3.5 is assumed to calculate the anticipated maximum day demand of the system of 2,720 gpm (Table 1).

Table 1. Water Demand Summary

Year	Population	Average Daily Demand (gpm)*	Maximum Daily Demand (gpm)*	Annual Demand (afy)
2010	4,749	500	1,750	815
2065	7,287	775	2,720	1,250
*rounded				

Water Use and issues

Current water use is shown in Table 2.

Table 2. Water Use

Community	Well Description	Depth of Well (feet)	Geologic Formation
Roundup	Two groundwater wells, located on the south side of the Musselshell River. The wells are drilled into an abandoned mine shaft and provide water from the same mine void.	N/A	N/A
Harlowton	Groundwater wells	400 – 1,400	Judith River and Eagle Sandstone Formation
Broadview	Groundwater wells	1,000	Eagle Sandstone Formation
Melstone	Groundwater wells	200	Fort Union

			Formation
Judith Gap	Groundwater and artesian wells	445	Judith River Formation
Musselshell	Groundwater	350	Fort Union Formation
Lavina	Private groundwater wells draw from a shallow aquifer composed of a sand lens subject to limited recharge.	< 150	Claggett Shale or Alluvium Formation
Hobson	The town has not constructed a distribution system and relies on a flowing artesian ground water well connected to a fill station	1,225	Kootenai Formation
Moore	A groundwater well, a pump facility and a 55,000 gallon finished water storage reservoir. The Town's primary source, Well 3, is a deep groundwater well that was completed in 1992 to a total depth of 1,820 feet.	1,820	Third Cat Creek Sandston or Basal Kootenai Formation



- **Water Demands.** Reclamation finds the sponsor's analysis of water demands is technically adequate at the feasibility level as specified under P.L. 109-451 §106.c.1, Rule §404.44.c.3 and §404.49.d.1, and D&S 12.C.3.a.

Water Supply

Surface Water

The study area encompasses portions of the Musselshell River and Judith River drainages. A number of streams and rivers bisect the pipeline corridor for the proposed action (see CMRWA 2014, Section 3.5.1 Surface Water Resources).

Major river systems within the study area are the Judith River and the Musselshell River. The Musselshell River is a tributary of the Missouri River, approximately 467 miles long (including its two primary tributaries), in central Montana. The Judith River is a tributary of the Missouri River, approximately 124 miles (200 kilometers) long, running through central Montana and the US.

Many of the tributary streams in the project area only have running water two months of the year. Musselshell River in Central Montana is a snowmelt fed stream (Reclamation et al 1998). Many of these streams pose "Dewatering concerns" (i.e., reductions in streamflow below the point where stream habitat is adequate for fish). Chronic dewatering is where dewatering is a significant problem in virtually all years. There are about 64 miles of river and tributaries that are chronically dewatered within the Judith River drainage: and 490 miles within the Musselshell River drainage.

Three reservoirs supply irrigation water:

- Bair Reservoir in the upper basin, with 7,010 acre-feet (af) of storage
- Martinsdale Reservoir in the upper basin with 23,110 af
- Deadman's Basin Reservoir about two-thirds of the way down the basin with 72,220 af (Reclamation et al.1998)

Ground Water

Communities currently use groundwater sources for domestic water. These wells use several aquifers from shallow (200 – 350 feet deep in the Fort Union Formation) to deep (1,225 – 1,820 feet deep in the Kootenai Formation) (see CMRWA 2014, Section 3.5.2 Groundwater Resources).

The proposed MJRWS wells would access and deliver water from the Madison aquifer, which is virtually undeveloped in the project area. The mean recharge to the Madison Formation in the Judith Basin is estimated to be 235,000 acre-feet per year.

Groundwater flow direction in the Madison Aquifer is to the northeast towards the North Dakota and Canadian borders. Big Spring to the south of Lewistown, the Hanover Well northwest of Lewistown and Warm Spring, also to the northwest of Lewistown, are the only known discharges from the Madison in the area. Approximately 180,000 acre-feet of recharge per year is contributed to the Madison Aquifer from the outcrops in the Little Belts Mountains. This volume accounts for nearly the entire legal demand of the existing diversions.

Although this aquifer is relatively deep, tapping it is reasonable in the Utica and Ubet areas where test wells have been drilled. At the Ubet well field site, the Madison aquifer was reached at 2,250 feet below ground surface with a static water level of 260 feet below ground surface. This indicates that the water there is an abundance of available drawdown; and the static lift required for pumping would be considerably less than some of the alternative well field developments.

Technical analysis demonstrated that adequate recharge is present in Judith Basin to serve the planned CMRWA diversion as well as all existing diversions. Aquifer conditions at the spring discharges are characterized by discrete, highly transmissive zones that convey extremely large flow rates to the diversion points. These conditions support the theory that aquifer properties are discontinuous, implying that continuity from the wellfield locations to the springs is unlikely. The large separation distances of about 30 miles further supports this (see CMRWA 2014, Section 4.2.2.1 Water Rights Summary for the Wellfield Alternatives and Phase 1 Study Chapter 4).

Climate Change

See CMWRA 2014 Appendix 19 for a climate change analysis. Interpretation of these results with consideration of the Ubet Wellfield declining recharge estimates indicates that evapotranspiration is expected to increase and that overall water availability in both the Musselshell Valley and Judith Basin will decline. Although climate change scenario families A2 and B1 show increases in both precipitation and runoff, the Ubet Wellfield recharge analysis, showing declines in recharge, would be expected for the aquifers produced by member communities. These aquifers are recharged under similar conditions to the Madison, but at lower elevation and at much lower recharge rates. Possible gains in runoff that could slightly increase recharge to a valley aquifer are likely to be intercepted by upstream irrigators.

These conditions would be expected to have associated deeper pumping water levels in the wells of member communities. In communities that produce from aquifers with little available drawdown, the community could experience lost capacity.

It is unlikely that member communities would experience significant changes in ground water quality. It is expected that should changes occur they would be adverse, similar to changes associated with drought conditions. When recharge becomes limited, more of the produced water is derived from storage in low permeability strata (shale, clay, etc.) which has a higher mineral content, is typically anoxic, and may also contribute hydrogen sulfide.



- **Resources.** Reclamation finds the sponsor's resource inventory and inventory of water supplies are technically adequate at the feasibility level.
- **Climate Change.** Reclamation finds the sponsor's climate change analysis is technically adequate at the feasibility level as specified under Reclamation's *Technical Guidance for Incorporating Climate Change Information into Water Resources Planning Studies*, September 2014.

Water Rights

As the proposed wellfield sites are remote, there are few other users of the Madison Aquifer in this area, and the aquifer is demonstrated to be hydraulically isolated from shallower wells in the area, CMRWA has been able to obtain all of the water rights it needs for the regional water system in 2014. CMRWA has obtained two water rights from the state of Montana for a maximum combined volume of 1,310 afy:

- For the Utica test well in 02/09/2006 for a maximum flow rate of 300 gpm (0.67 cubic feet per second [cfs], 484.30 afy)
- For the Ubet test well in 03/04/2013 for 2,540 gpm (5.66 cfs, 825.70 afy)

The Utica test well's point of diversion was changed to the Ubet well field after the drilling and analysis of the Ubet test well. (See CMRWA 2014, Executive Summary, Section 6.1.6 Water Rights, and Appendix 22.)



Reclamation finds that:

- **Water Supply.** The sponsor's analysis of water supplies is technically adequate at the feasibility level.
- **Water Sources.** The sponsor considered all sources of water, including brackish and low quality water as specified under P.L. 109-451 §106.c.3, Rule §404.44.c.1 and §404.49.d.4, and D&S 12.C.3.d.

Table 3 illustrates that the acquired water rights will adequately meet the demand of the proposed project for the 50 year planning period while allowing for a slight factor of safety.

Table 3. Water Rights

Water Right	Maximum Flow Rate		Maximum Volume (Annual)	
	gpm	cfs	afy	gallons
41S30019140	300	0.67	484.30	157,809,850
41S30065672	2,540	5.66	825.70	269,055,525
TOTALS	2,840	6.32	1,310	426,865,370
<i>Estimated System Demand</i>	2,720	6.06	1,250	407,340,000

Water Quality

Surface Water

Difficulty in treating the river water to meet the recent EPA LT2 Rule makes it very costly to use the river for surface water.

Groundwater

The very poor quality of groundwater in the Musselshell region and as well as the dwindling quantity have negative effects on any possible economic development of the area. Shallow aquifers (generally the Kootenai and Ellis groups) have poor water quality. The deep Madison aquifer has local areas of poor water quality, but is generally good at the proposed well fields (see CMRWA 2014, Table 4.1).



- **Water Quality.** Reclamation finds the sponsor's analysis of water quality is technically adequate at the feasibility level as specified under P.L. 109-451 §106.c.1, Rule §404.44.c.3 and §404.49.d.1, and D&S 12.C.3.d.

Chapter 3. Alternatives

Specific Planning Objectives

The planning objectives for this project are:

- Provide water to customers that meets all primary and secondary MCLs for drinking water
- Provide adequate quantity of water to customers within the service area now and for the life of the project
- Ensure that cost of service to provide the appropriate quality and quantity of water to customers does not represent economic hardship
- Provide adequate storage to meet average day demands plus two hours of fire flow.

- Provide maximum day water demand to member communities through the planning period (2065).

(See CMRWA 2014, Executive Summary I.vii and Section 2.5: Planning Objectives, Constraints, and Opportunities.)



- **Objectives.** Reclamation finds that the project's objectives are appropriately defined/and adequate and consistent with RWSP objectives as described under P.L. 109-541 §105.3; Rule §404.4, 404.13, and 404.44.c; and D&S 10.B.1.A and 12.C.3.

Opportunities and Constraints

Opportunities include improving the quantity and quality of water in the project area (see CMRWA 2014, Section 2.5 Planning Objectives, Constraints, and Opportunities).

Constraints include a number of environmental commitments as listed in CMRWA 2014, Section 3.3 Environmental Commitments.



- **Constraints.** Reclamation finds the sponsor's discussion of constraints is technically adequate at the feasibility level as specified under D&S 12.C.3.

Alternatives Considered

CMRWA considered a wide range of alternatives as listed below.

- Relying on local water systems:
 - Obtain various local sources of new water (**Eliminated:** poor water quality, limited surface supplies, and required treatment, also fails to address rural customers)
 - Use existing local sources (**Eliminated:** required treatment and operations and maintenance [O&M] are significant and does not provide a watershed management approach)
- Creating a regional water system:
 - Use existing source at Roundup (**Eliminated:** required treatment and booster pump stations is cost-prohibitive)
 - Purchase water from the City of Billings, Montana (**Eliminated:** pumping is cost-prohibitive)

- o Use surface water (**Eliminated:** water rights are difficult to obtain, treatment would be needed, susceptible to drought)
- o Use shallow aquifers (**Eliminated:** water rights are difficult to obtain, treatment would be required, insufficient water production)
- o **MJRWS:** Use the deep Madison aquifer (**Considered:** reasonable drilling in Utica and Ubet areas, good water quality, water rights easier to obtain, treatment not required).

As noted, all but one alternative were eliminated.

See CMRWA 2014, Section 4.1 Formulation of Alternatives and Table 4-1.



Reclamation finds that:

- **Range.** Reasonable range of alternatives (structural or nonstructural) has been formulated and evaluated as required under Rule §404.44.a and D&S 10.B.4.
- **Program Objectives and Priorities.** The RWSP program priorities are incorporated into the range of options considered as listed under Rule §404.49.a and D&S 7.D.
- **Screening and Non-Viable Alternatives.** The screening process was consistently applied and all alternatives were evaluated in a way that meets Reclamation planning standards at a feasibility level.
- **All Water Sources.** The alternative screening meets the criteria for adequately considering all water sources within the project area as specified in P.L. 109-451 §106.c.3, Rule §404.49.d.4, and D&S 10.B.2.d.
- **Low Quality Water.** The sponsor addressed opportunities to treat and use low-quality water or non-potable water, water-reuse based supplies, and brackish and saline waters, through innovative and economically viable treatment technologies as specified under P.L. 109-451 §106.c.3, Rule §404.49.d.4, and D&S 10.B.2.d.4 Section 4.2.6.3.

No Action Alternative

The No Action Alternative describes the actions most likely to occur and the consequences of taking no Federal (Reclamation) action. Under No Action, wells (re-drilling and casing), pumping systems, piping, buildings, treatment systems, controls, and other electrical items would continue to be rehabilitated or replaced periodically throughout the period of analysis.

Reasonably Foreseeable Future If Reclamation Is Not Involved

Without Reclamation involvement, CMRWA would be forced to rely on intermittent state funding, if they can get this. The other funding sources would not be sufficient to cover the costs needed for a sustainable, region-wide water supply. Thus, under no action, local actions would be the only way to provide water. If no action is taken:

- Affected communities, particularly those that depend on the Musselshell River and extremely limited groundwater resources, will continue to endure ever more severe negative impacts as growth and the demand for water increases.
- Affected communities must continue to rely on poor quality water with rising costs of treatment.

(See CMRWA 2014, Section 4.1.1 Future Without a Project).

Existing and Under Construction Infrastructure and Planned Non-Structural Actions

There are no planned or under construction infrastructure or non-structural actions at this time.



No Action Alternative. Reclamation finds that:

- The no action alternative is well defined and the system described under the no-action alternative is not included in any of the action alternatives.
- The feasibility study analysis has properly used the No Action Alternative as the base to compare action alternatives.

Preferred Alternative

Description

The MJRWS would develop groundwater wells within the Madison Aquifer and pump water to each of the member communities as well as smaller communities and local users along the pipeline route. Five well sites were considered and hydraulically modeled so that associated capital and lifecycle costs could be estimated and compared. The preferred well site is the Ubet site, which has the second lowest capital cost and lowest OM&R costs of any alternative (see CMRWA 2014, Section 4.2.2 Musselshell Judith Regional Water System with New Source).

Water and Supply

The Madison Aquifer test wells at Utica and Ubet have proven that the CMRWA can develop an adequate quantity of high quality water from the Madison (see CMRWA 2014, Section 4.2.2 Musselshell Judith Regional Water System with New Source). A test well was constructed at the Ubet site.

The production zone of the well was subsequently set at 2,250 feet below ground surface. Based on samples of drilling cuttings, the producing interval of the well occurs in fractured limestone within the Madison Formation. Based on results from the step and constant rate pump tests and subsequent analysis, it was determined that the formation could support a three well system, each with a capacity of 1,500 gpm (see CMRWA 2014, Section 6.1.5 Ubet Test Well).

Design

MJRWS includes the following key components (Figure 1):

- **New water source.** A new Ubet wellfield would have 3 wells which penetrate the Madison Aquifer. Minimal water treatment would be required.
- **Storage facilities.** A total of 4 new storage facilities would be constructed to add 1.35 million gallons of storage to the planning area. The tanks would be buried concrete storage tanks which have a very long life (>50 years) and require almost no maintenance.
- **Broadview booster station.** A booster pump station would be constructed to provide water to the Town of Broadview which is at a higher elevation than Lavina (the town preceding Broadview along the pipeline route).
- **Distribution system.** The new distribution system would be composed of approximately 250 miles of pipe as well as related infrastructure such as pressure reducing valves, flow meters and supervisory control and data acquisition (SCADA) controls.

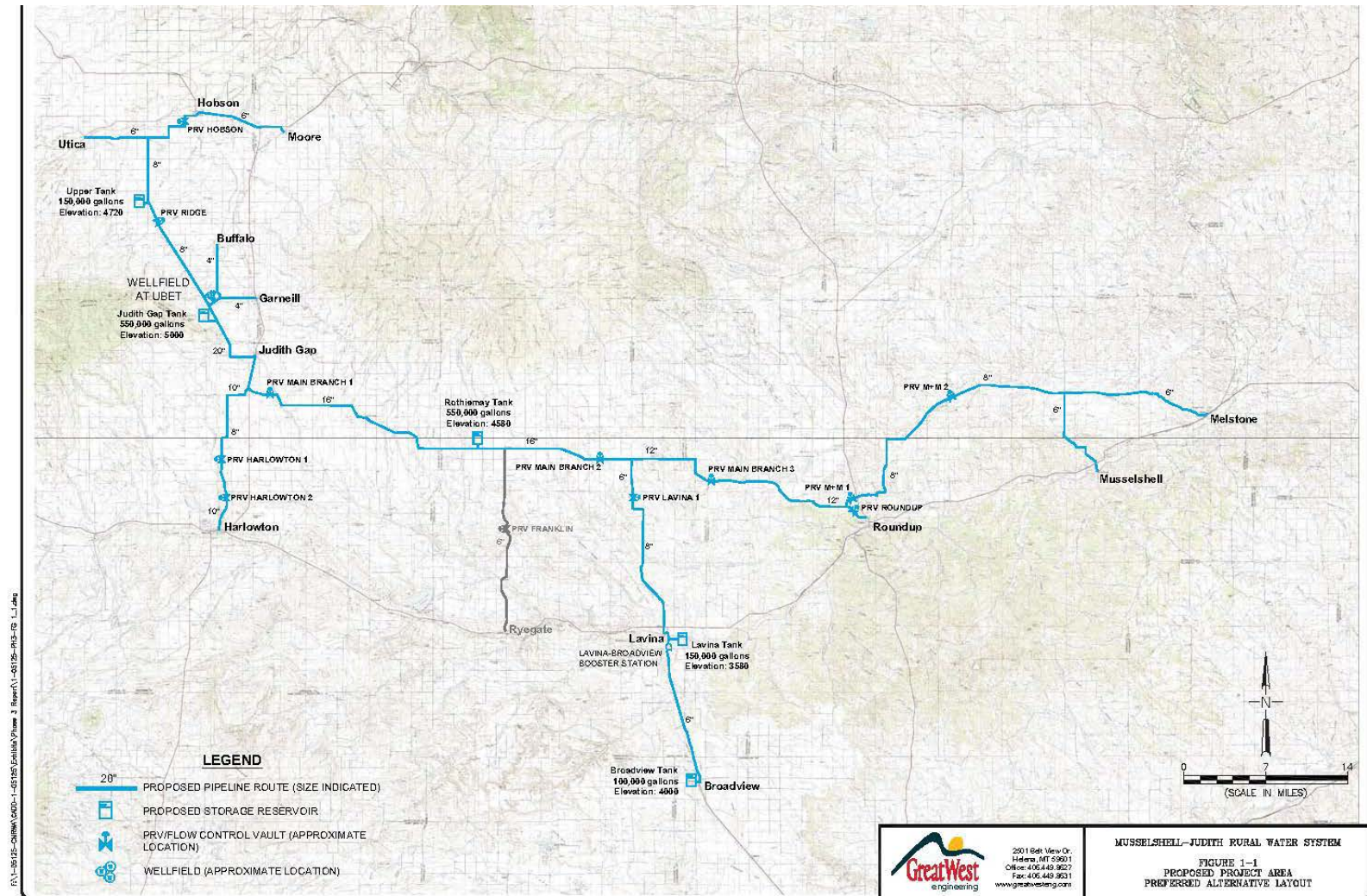


Figure 1. MJRWS with pipeline and wellfield.

(See CMRWA 2014, Sections 4.2.2, 4.2.3, and 4.2.4 for a description of the alternative and 6.3 for a description of the benefit cost ratios. Appendix 14 provides the economic analyses as specified under the Principles and Guidelines for Water and Related Land Resources. Implementation Studies [Principles and Guidelines].)



Reclamation finds that the designs:

- Meet Reclamation criteria for design standards.
- Are technically feasible, and this plan can be constructed within industry standards as specified under Rule §404.49.d.14

Water and Energy Conservation

CMRWA incorporates water conservation into the alternative to lower demand to 153 gpcd as the design basis and strive for an ultimate goal of 130 gpcd. The national average for water usage is 160 gpcd and the average in Montana for metered rural communities is 180 gpcd. (See CMRWA 2014, Section 2.2 and the Water Conservation Plan, CMWRA Appendix 6.) The project incorporates opportunities for energy conservation and renewable elements, including using:

- **A gravity system.** By placing the wellfield and main supply tank at a higher elevation than the rest of the system, the need for booster stations to maintain system pressure is eliminated (see CMRWA 2014, Section 4.2.6.1).
- **Solar arrays at the wellfields.** At each of the 5 five well sites, 50 kilowatt (kW) solar arrays could provide up to 20 percent of the total predicted electricity demand of the new wellfield (see CMRWA 2014, Section 4.2.7.10).
- **Hydro-powered generators.** These would be within the pressure reducing valve (PRV) vaults to power a remote terminal unit (RTU), fan, a light, and a small pump for injection of chemicals. The generator would divert a small portion of the flow from the high pressure side of the PRV to operate a small power generation unit and then returns the water—now reduced in pressure—to the low pressure side of the PRV (see CMRWA 2014, Section 4.2.6.1).

The alternative analysis considered the preferred alternative with and without water conservation and renewable energy. Without these components, the amount of water and subsequently energy used increases.

Cost Estimates

Total costs for the project (extracted from Appendix 14 revised December 18, 2014) are:

- No action: \$100,683,300-Cost for maintaining existing operations and infrastructure.
- MJRWS with the water conservation and renewable energy components described in the previous section: \$106,428,000.
- MJRWS without water conservation and renewable energy components: \$106,414,700.

Capital costs are more expensive for the water conservation and renewable energy component: \$87,102,000 with and \$86,794,000 without.

However, the annual OM&R costs would be more without water conservation or renewable energy (\$580,600 without and \$569,600 with). Over the 50-year life cycle, costs would be \$3,799,300 without water conservation or renewable energy, and \$3,314,000 with, thus saving \$485,300 over the life of the project. Moreover, the annual cost savings as a result of the use of solar arrays are predicted to double as the cost per kilowatt hour (kWh) of electricity increases. This cost is less than 1 percent of the total capital cost of the project and will benefit the MJRWS for the life of the project through O&M cost savings (see CMRWA 2014, Section 4.3.2 for cost comparisons and table 4-51 and 4-54 for costs).

Principles and Guidelines Analysis

See CMRWA 2014, Section 4.4 for the comparison displays for the Principles and Guidelines (P&G) analysis.

National Economic Development Account. The NED account found a benefit cost ratio of 1.28-1.31 for the MJRWS (with or without the water conservation and renewable energy components).

Environmental Quality Account. There would be no impact on aesthetic resources, nor would there be any cumulative effects. As there would be future inventory and protection, there would be no impacts on cultural resources. While there would be no significant or long-term impacts on ecological resources, there would be small short term impacts on surface water quality, groundwater head change at Big Spring (-0.2 feet), wetlands, and wildlife.

Other Social Effects Account. MJRWS (with or without the water conservation and renewable energy component) would benefit the community and enhance the quality of life by providing good quality water in a sufficient quantity. The alternative would create 3 full-time and 1 to 2 part time positions. Energy use would be 1.64 million kW-h per year with water conservation and renewable energy and 1.8 million kW-h without.

Financial Feasibility

Financial feasibility is based on the ability of water users to pay the costs of the project. These costs may be paid through monthly user fees, retirement of debt incurred to build the project, tax assessments, or through other funding methods. If project costs are determined to be greater than the ability of water users to pay for a project, then imposing the cost of project repayment will result in an unacceptable financial hardship to water users.

The weighted average project payment per month indicates the overall project meets the EPA 2 1/2% affordability threshold at a 75% Federal cost share and the project meets the high range of payment capability at a 65% Federal cost share. The analysis to determine estimated payment capability for project water users indicates a 65% to 75% Federal cost share would result in a financially feasible project for the local water users. (See CMRWA 2014, Appendix 14: Reclamation's Economic and Financial Analysis Report.)

Feasibility Checklist for Preferred Alternative

Reclamation's subject matter experts find that there is at least one feasible alternative that would accomplish the objectives to be addressed by the proposed project. Reclamation finds that the proposed alternative is clearly supported by the feasibility study, based on application of the following factors, including the extent to which the alternative meets the specific criteria under the Act, Rule, and Directives and Standards as shown in Table 4.

Table 4. Feasibility Checklist

Viability Checklist	Chapter/Section of CMRWA Feasibility Study
Addresses near and long-term water demand as specified under P.L. 109-541 §105.c.1.C, Rule §404.44.c.3 and §404.49.d.1, D&S 10.B.4.b.ii	Chapter 4
Advances public health and safety and consideration of other benefits of the proposed rural water supply project as specified under P.L. 109-541 §105.c.1.C; Rule §404.13.a.2, §404.44.c.2, and §404.49.d.2; D&S 10.B.2.b.d	Chapter 4
Addresses environmental quality and source water protection issues as specified under P.L. 109-541 §105.c.1.E, Rule §404.44.c.4 and §404.49.d.3, and D&S 10.B.4.b.vii and long term protection as specified under P.L. 109-541 §105.c.1.G.ii and Rule §404.44.c.8	Chapters 3 & 5 Appendix 3- Environmental Assessment July 2014
Provides for local control of water supplies and, where applicable, encouraging participation in water banking and markets as specified under P.L. 109-541 §105.c.1.G.i.II, Rule §404.44.c.7 and §404.49.d.5, and D&S 10.B.4.b.viii	Chapter 2 Appendix 6-Water Conservation Plan
Uses a watershed perspective and promotes benefits within the region as specified under P.L. 109-541 §105.c.1.F, Rule §404.13.a.2.b and §404.44.c.5, and D&S 10.B.4.b.viii and 12.C.1.d.	Chapters 3,4, & 5
Incorporates an integrated water resources management approach as specified under P.L. 109-541 §105.c.1.G.i.I, Rule §404.44.c.6, and D&S 10.B.4.b.viii	Section 2.2 Appendix 6-Water Conservation Plan
Reclamation finds that the proposed project addresses opportunities for water and energy conservation through structural or nonstructural approaches and demonstration technologies to reduce water use and water system costs as specified under P.L. §102.9.B and §106.c.5 (innovation) and 6 (market-based); Rule §404.49.d.5 (innovation) and 6 (market-based); and D&S 10.B.4.b.i and iii D&S 12.C.1.e., and D&S 12.D.3.b and c.	Chapter 2 Appendix 6-Water Conservation Plan
Addresses opportunities to take advantage of economic incentives and the use of market-based mechanisms as specified under Rule §404.49.d.6	Chapter 4 Appendix 7-Renewable Energy Report
Reclamation finds that the recommended plan's economic analysis is consistent with the P&Gs (Rule §404.4.c as specified under Rule §404.49.d.8)	Chapters 4 & 6 Appendix 14-Economic and Financial Analysis
Has clear deliverables, will be accomplished within a reasonable schedule, within budget, and is well managed as specified under Rule §404.49.d.17	Chapters 6 & 7
Meets technical and industry feasibility standards	Chapters 4 & 6

Viability Checklist	Chapter/Section of CMRWA Feasibility Study
Meets Reclamation criteria for cost estimates	Chapters 4 & 6 Appendix 4-OM&R Plan Appendix 15-Detailed Costs Estimates Appendix 20- Bottoms Up Cost Estimate
Includes a reasonable, supported estimate of construction costs and OM&R costs as specified under P.L. 109-541 §105.c.1.H and §106.c.7.A, Rule §404.49.d.7, D&S 10.B.3.b.v and 12.D.2.f and g	Chapters 4 & 6 Appendix 4-OM&R Plan Appendix 15-Detailed Costs Estimates Appendix 20-Bottoms Up Cost Estimate
Includes a reasonable and supported OM&R plan to assist the project sponsor in establishing rates and fees and a schedule identifying how those costs should be allocated to each non- Federal project sponsor as specified under Rule §404.49.d.9	Appendix 4-OM&R Plan
Include adequate administrative and financial controls to manage construction and operation, maintenance, and replacement of the project as specified under Rule §404.49.d.12	Chapters 4 & 6
Demonstrates the sponsor's financial capability to pay at least 25 percent of the design and construction costs and 100 percent of the operation, maintenance, and replacement costs as specified under Rule §404.49.d.10.?	Chapter 6
Is eligible for guaranteed loans as specified under Rule §404.49.d.11	Executive Summary, Page xii
Is eligible for assistance under other Federal authorities to pay for discrete features or portions of the project as specified under Rule §404.49.d.13	Executive Summary, Page xii
Involves partnerships with other state, local, or tribal governments or Federal entities as specified under Rule §404.49.d.15	Chapters 4, 6, & 7
For Indian tribes and tribal organizations, the extent to which alternative addresses the goal of economic self-sufficiency as specified under Rule §404.49.d.16	N/A

Chapter 4. Affected Environment and Environmental Consequences

Geology and Soils

- **No Action.** No impacts. Soil disturbance would continue at current rate.
- **MJRWS.** The pipeline and storage tank development would disturb soils and prime farmland along the pipeline route. These areas would also be reclaimed as soon as disturbance activities were completed. Soils within the project area are not highly erodible and disturbed soils would be reclaimed and reseeded.

(See CMRWA 2014 Sections 3.4 and 5.2 for discussions of geology and soils.)

Water Resources

Water resources are discussed above in water supply. Historical and projected climate change would decrease runoff during the spring and early summer. Climate changes in the Missouri Basin could lead to moderate decreases in adequate and safe water supplies, which are fundamental to health, economy and ecology. (See CMRWA 2014 Sections 3.5 and 5.3 for discussions of water resources.)

- **No Action.** No impacts other than continued development of shallow groundwater and limited surface water.
- **MJRWS.** The proposed action may cause a small, temporary increase in turbidity where the pipeline crosses the smaller streams during construction, but would end after completion of the project. Based on climate model projects, groundwater recharge at the Ubet Wellfield is predicted to decrease. (See CMRWA Appendix 19: Climate Change.) The declining recharge is expected to require deeper pumping of the wellfield, although the recharge would still vastly exceed the volume of water pumped from the aquifer so the overall effect would not be a decrease in groundwater volume.

Vegetation

The most common communities are grasslands and shrublands, altered for both dry and irrigated farmlands. No threatened or endangered plants were identified to occur within any of the counties involved in the proposed action. (See CMRWA 2014 Sections 3.6 and 5.4 for discussions of water resources.)

- **No Action.** No impacts. Ground disturbing activities and disturbance to plants and their habitat would occur at the present rate.
- **MJRWS.** Temporary impacts on vegetation; however, these impacts would occur over a relatively small area and would be reclaimed upon completion of installation.

Wetlands

Most of the wetlands are in the western and central portion of the project area. (See CMRWA 2014, Sections 3.7 and 5.5 for discussions of wetlands.)

- **No Action.** No impacts.
- **MJRWS.** Some disturbance of wetlands and temporary disturbance of wetland functions and values within those disturbed wetlands. Due to mitigation measures, it is expected that a relatively small area of wetlands would be disturbed (see CMRWA 2014, Section 3.3 Environmental Commitments).

Wildlife

The project area offers a wide variety of both game and nongame species, including many migratory birds and raptors. (See CMRWA 2014, Sections 3.8 and 5.6 for discussions of wildlife.)

- **No Action.** No impacts.
- **MJRWS.** Disturbance activities associated with well development would be short-term and any displaced wildlife would resume activities within the well field area after completion of well development. Compliance with Avian Power Line Interaction Committee's suggested practices for power pole/line development to avoid impacts to raptors would avoid any negative impacts to raptors from utility poles.

Special Status Species and Habitat

The project area overlaps the distribution with a variety of Federal and state recognized species of concern, including greater sage grouse and black footed ferrets. The impacts to these species would not differ from those impacts discussed within the Wildlife Resources Section. (See CMRWA 2014, Sections 3.9 and 5.7 for discussions of species of concern.)

- **No Action.** No impacts.
- **MJRWS.** Mitigation measures presented within the proposed action would protect grouse during their breeding and nesting season and ensure that the proposed action would not impact them (see CMRWA 2014, Section 3.3 Environmental Commitments)..

Fish

Fisheries habitat within the project area varies, although the most of streams with viable fisheries are tributaries of the Musselshell River or the Judith River. The Musselshell River is one of Montana's cold water rivers with cutthroat trout in the upper reaches and walleye, sauger, channel catfish, and paddlefish in the lower parts. (See CMRWA 2014, Sections 3.10 and 5.8 for discussions of fish.)

- **No Action.** No impacts.
- **MJRWS.** Mitigation measures would protect fish habitat from sediments. Impacts to streams would be reviewed by the ID Team and perennial streams would be bored under

in order to protect fish habitat and water quality (see CMRWA 2014, Section 3.3 Environmental Commitments).

Social and Economic

(See CMRWA 2014, Sections 3.11 and 5.9 and Appendix 3: EA for discussions of socioeconomics and Appendix 14: for economic and financial analysis.)

The project would bring short-term construction impacts.

- **No Action.** No traffic concerns.
- **MJRWS.** Traffic and maintenance of traffic flow would be a high priority during any construction activities within the highway ROW. Disruptions of traffic would be kept to a minimum

CMRWA is composed of small communities with limited resources. According to the US Census Bureau, median household income (MHI) for major communities within the project area is generally between 33% and 60% of the national average of \$52,029 (as reported for 2008). The average MHI for the major communities within the region is \$25,487, or approximately 49% of the national average. (See CMWRA Appendix 8: Appraisal Report, Section III. Findings.)

- **No Action.** If communities and rural customers within the proposed project area were compelled to fully finance the estimated project capital cost at nearly \$126 million, the corresponding user rate would be exorbitant and unaffordable.
- **MJRWS.** Project is financial feasible and participants have a willingness and ability to pay if the project is cost-shared by Federal and State.

Environmental Justice

The impacts from the proposed action would not be adverse and may have a positive economic benefit to the communities that would be served. The proposed action will not have significant socioeconomic impacts (see CMRWA 2014, Section 5.9.2.1 for a discussion of environmental justice issues).

Indian Trust Assets

There were no physical assets held in trust by the government for Indian tribes or individuals identified in the service area. Physical assets may include land, minerals, timber, hunting and fishing rights or instream flows. Therefore, no impact is anticipated. (See Appendix 8, Appraisal Report, Chapter 5: Affected Environment.)

Cultural Resources

Two hundred and four sites were identified in sections where the proposed wellfield and pipeline route are located. At this point, it is not known how many sites are located within the undisturbed proposed rights-of-way as the site database only describes site location to the quarter-section.

Additionally, the proposed pipeline route may be altered in the future so the results of the record search should be used as a guide for estimating site types and relative proportion of site types that

will be encountered as the project progresses. (See CMRWA 2014, Sections 3.12 and 5.10 for discussions of cultural resources.)

- **No Action.** No impact
- **MJRWS.** The proposed action would not significantly impact cultural resources as these resources would be protected through cultural resource inventories conducted during the design process. It is unlikely that cultural resources would be located within the majority of the proposed route as much of the route would occur within a ROW that has been previously disturbed.

Land Use

Land use within the project area has relatively little diversity, as it is predominately agriculture. Dryland and irrigated farming and livestock grazing are the most common land uses within the project area. The proposed pipeline route bisects lands owned by State, Federal, and private entities and intersects or terminates within a number of small towns. (See CMRWA 2014, Sections 3.13 and 5.11 for discussions of land use resources.)

- **No Action.** No impact
- **MJRWS.** Pipeline and storage tank installation would temporarily disturb land surface within the project area and would eliminate the potential for subsurface disturbance within the pipeline route. Surface disturbance activities would be minimal and short-term and would have minimal impacts and land use activities. Most of the pipeline route would occur within or immediately adjacent to state and county rights of way.

Impacts Checklist

Reclamation's subject matter experts have examined the alternatives and determined that there is no significant environment or environmental consequences for the MJRWS as identified in the preceding sections.

Chapter 5. Consultation and Coordination

The CMRWA held regular board meetings as well as additional public meetings while developing this project (see CMRWA 2014, Executive Summary I.i)

The scoping period began on November 15, 2010, with the publication of the scoping meeting notices, and the comment period was extended to January 30, 2011. Issues raised during scoping guided what is evaluated in the EA. Scoping meeting notices were mailed to all government agencies or individuals determined to be a stakeholder in the MJRWS, including all landowners within 1 mile of the proposed pipeline route. The CMRWA hosted three public scoping meetings to present the proposal, with a combined attendance of 81 people. Thirty-one comments were received (see CMRWA 2014, Executive Summary I.i and Section 3.1 for public involvement).

The CMRWA works with other entities and agencies including:

- Central Montana Resource Conservation and Development
- The Snowy Mountain Development Cooperation
- Central Montana Resource Conservation District
- Montana Department of Natural Resources (DNRC)
- Montana Fish, Wildlife, and Parks

As the project continues to develop, CMRWA will be coordinating with:

- State Historic Preservation Office
 - Cultural/Historical Clearances
 -
- US Army Corps of Engineers
 - Wetlands
 - Other Jurisdictional Important Waters
 -
- County Government
 - Right-of-Way
 -
- Montana Department of Transportation
 - Right-of-Way
 -
- Bureau of Land Management
 - Right-of-Way
 - Environmental Clearance
 -
- Montana Department of Environmental Quality (DEQ)
 - Design
 - Construction Standards and Permitting

CMRWA is pursuing funding partnerships with multiple government agencies, including:

- Montana Treasure State Endowment Program Regional Water Trust Fund– The program will fund up to 12.5% of design and construction costs for authorized projects.
- Montana DNRC – The DNRC is currently providing funds for project planning, engineering, water rights, and administrative costs.
- Central Montana Resource Conservation District provides project administration and oversight.



Reclamation finds that the study adequately consulted and/or coordinated with all the appropriate parties/agencies/stakeholders. (D&S 12.C.1.a).

Chapter 6. Findings

At appropriate points in this Reclamation Feasibility Report, call-out boxes summarize Reclamation's findings regarding the particular topic.

Chapter 7. References

APLIC. (2006). *Avian Power Line Interaction Committee. Suggested Practices on Power Lines: The State of the Art 2006*. Washington, DC and Sacramento, CA: Edison Electric Institute, APLIC, and the California Energy Commission.

Code of Federal Regulations, 2008. "Reclamation Rural Water Supply Program." Interim Final Rule. *Code of Federal Regulations*, Title 43, Pt. 404, 2008 ed.

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Reclamation, 2010. Reclamation Manual. Draft Directives and Standards: Rural Water Supply Program.

Water Resources Council, 1983, Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. March 10, 1983.

Reclamation, 2014. Reclamation Manual. Technical Guidance for Incorporating Climate Change Information into Water Resources Planning Studies.

Appendix A: Sponsor's Feasibility Study Report Document List

The sponsor's materials are provided along with this report and include four separate three-ring binders. The material is as follows;

- Binder 1 – MJRWS Feasibility Report, November 2014.
- Binder 2 – MJRWS Feasibility Report, Appendices 1 – 5.
- Binder 3 – MJRWS Feasibility Report, Appendices 6 – 9, 11, 14 – 23.
- Binder 4 – MJRWS Feasibility Report, Appendices 10, 12, and 13.

Appendix B: Finding of No Significant Impact Non-Decisional

RECLAMATION

Managing Water in the West

FINDING OF NO SIGNIFICANT IMPACT NON-DECISIONAL

MUSSELSHELL-JUDITH RURAL WATER SYSTEM

CENTRAL MONTANA REGIONAL WATER AUTHORITY



RURAL WATER SUPPLY ACT



U.S. Department of the Interior
Bureau of Reclamation
Great Plains Region
Montana Area Office

March 2015

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

FINDING OF NO SIGNIFICANT IMPACT NON-DECISIONAL

MUSSELSHELL-JUDITH RURAL WATER SYSTEM

FINDING

Based on the analysis of the environmental impacts as described in the Musselshell-Judith Rural Water System (MJRWS), Central Montana Regional Water Authority (CMRWA) Environmental Assessment (EA), the Bureau of Reclamation (Reclamation) finds that all potentially significant issues and resource impacts have been identified, evaluated, addressed, and resolved. In accordance with the National Environmental Policy Act of 1969 (NEPA), as amended, and the Council on Environmental Quality's Regulation for Implementing the Procedural Provisions of the NEPA (40 CFR Parts 1500-1508), Reclamation has determined that the proposed action will not have a significant impact on the quality of the human environment and that an Environmental Impact Statement is not required.

PROPOSED ACTION

Under the Rural Water Supply Act, Reclamation proposes to provide funding to the CMRWA for the development and construction of the MJRWS. The proposed water system would provide safe and reliable water for drinking, household uses, livestock, and yard irrigation (not crop irrigation) to member communities and individual rural members of the CMRWA. The MJRWS would be designed to serve a population of 7,300 people in the CMRWA member communities.

The proposed action includes a well field with a maximum daily demand of 1,750 gpm for the current population and 2,720 gpm for an estimated population in 2065. Further, four storage facilities and associated features are part of the distribution network; a 550,000 gallon tank northwest of Judith Gap, a 150,000 gallon tank southeast of Utica, a 550,000 gallon tank just west of Rothiemay, and a 100,000 gallon tank west of Broadview. Depending on the location and people to be served, approximately 230 miles of pipeline of diameters from 4 to 20 inches are proposed to be constructed.

PURPOSE AND NEED

The purpose of the MJRWS project is to provide safe and reliable water to communities within MJRWS project area. This project is needed because these communities and rural areas have poor quality of water and deal with challenges in obtaining reliable, safe drinking water on an annual basis.

Summary of Environmental Effects

Reclamation has analyzed the effects of the Proposed Action in the final EA. The effects of the Proposed Action are summarized below:

Geology and Soils

Minor short term impacts on geology and soils are anticipated due to the pipeline location and alignment. No long term impacts are anticipated due to the construction areas being already disturbed areas.

Water Quantity

Groundwater impacts would be minimal and would not affect the demands of existing groundwater rights or create adverse effect upon their diversions because:

- Basin wide water balance surplus suggest recharge volume exceeds the legal demands of existing diversions by 25,000 to 71,000 acre feet and exceed the requirements of the CMRWS proposed action by an order of 10 or more.
- A groundwater model used to evaluate head change in the aquifer at the existing diversions projected the well interference at the existing Madison Formation wells due to the proposed well field withdrawals would not constitute an adverse effect, as water rights do not protect pressure, but only rate and volume of production.
- An initial water right permit for the Utica Test Well was successfully secured under the condition that springs and other wells be inventoried and monitored during well field testing and use. This condition was carried over onto the final water right which the Montana Department of Natural Resources and Conservation issued for the Ubet site in 2014. This water right covers the entire water usage requirements needed for the project. Adverse effects detected on existing water rights from well field withdrawals that cannot be mitigated will result in project abandonment (Great West Engineering, 2010a).

Water Quality

Impacts on surface water quality would be minor and short-term due to requirements for a Stormwater Pollution Prevention Plan (SWPPP), construction timing, pre-construction consultation, and environmental commitments.

Vegetation

Impacts on vegetation would be minor and short-term because disturbance would be kept to a minimum and disturbed areas would be reclaimed and vegetation would be reseeded and restored.

Wildlife

There would be no long term effects on wildlife or wildlife habitat because of environmental commitments. The distribution of wildlife is low within these areas relative to the region.

Threatened and Endangered Species

The proposed action will have no effect on threatened or endangered species. Further, implementation of environmental commitments would minimize the impacts from utility poles and power lines on raptor species.

Fisheries

There would be no impact on fish or their habitat because of environmental commitments.

Social and Economic Resources

Impacts on social and economic conditions would be minor with small increases to the labor force. Residents and local business may see a minor effect because appliances and equipment would need to be replaced less often, reduced need for water treatment systems and supplies, bottled drinking water, and services if the demand is decreased by the improved water quality.

Cultural Resources

There would be no adverse effects on cultural resources or historic properties because cultural surveys will be conducted prior to alignment being determined and design will avoid cultural sites. Construction will be monitored to avoid impacts on sites previously unknown.

Indian Trust Assets

There are no Indian Trust Assets (ITA) identified in the project area; therefore, the proposed action will not affect ITA.

Land Use

The majority of the project facilities would be buried. The limited project features above ground would have minimal affect or change on land use.

Executive Orders

Executive Order 11990 – Protection of Wetlands

Federal agencies shall avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities.

Impacts on wetlands would be minimized by immediate reclamation and restoration. Relatively small area of wetlands would be disturbed, but would be mitigated and no net loss of wetlands would occur.

Executive Order 11988 – Floodplain Management

Federal agencies shall avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to minimize the impact of floods

on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out the agency's responsibilities.

The proposed action is in compliance with this Executive Order and was determined to have no effect on floodplains or floodplain management.

Executive Order 13186 – Protection of Migratory Birds

The United States has ratified international, bilateral conventions for the conservation of migratory birds. These international migratory bird conventions impose substantive obligations on the United States for the conservation of migratory birds and their habitats, and through the Migratory Bird Treaty Act (16 U.S.C. 703-711) (Act) will implement these conventions. This Executive Order directs Federal agencies to take certain actions to further implement the Act.

The proposed action is in compliance with this Executive Order and determined to have no negative effects on migratory birds.

Executive Order 13007 – Indian Sacred Sites

Federal agencies shall, to the extent practicable, and not clearly inconsistent with essential agency function; accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites.

The proposed action is in compliance with this Executive Order and was determined to have no effect on Indian Sacred Sites.

Executive Order 12898 – Environmental Justice

Federal agencies need to ensure their actions do not disproportionately impact minority and disadvantaged populations or communities.

This proposed action would provide potable water to rural communities. This action is in compliance with this Executive Order and was determined to have no negative effect on minority or low income populations.

ENVIRONMENTAL COMMITMENTS

Environmental commitments are implemented to avoid, mitigate, or monitor environmental impacts associated with the proposed action. These commitments have been developed in coordination with federal, state, county, and local agencies. These commitments would be implemented before construction and operation unless otherwise specified. The project budget includes significant resources to conduct a more detailed identification of natural resources and development of site specific mitigation measures during design. An Interdisciplinary Team (ID Team) will be established to evaluate proposed construction locations and alignment and evaluate past construction areas to insure project sponsors and contractors have complied with these environmental commitments. The ID Team will be made up of subject matter experts from federal, state, and local agencies.

Prime and Unique Farmlands and Soils

- Maximize construction of pipelines next to existing roads to eliminate or reduce the need for new maintenance or access roads;
- Return topography to preconstruction contours and mound soil over pipeline to allow settling;
- Control erosion by reseeding areas disturbed by pipeline placement as soon as possible following construction during acceptable dryland seeding timeframes in either the fall or spring;
- Topsoil would be separated and stockpiled before pipeline excavation greater than 18 inches wide (using backhoes). If pipelines are plowed in or trenchers are used (18 inches or less), the topsoil may be incorporated with subsoil during backfilling;
- Replace the topsoil as the last step in the backfilling process, so the protective soils will be returned to the soil horizon;
- Install sediment barriers to reduce water erosion on slopes greater than five percent;
- Leave buffer stripes of undisturbed vegetation adjacent to waterways;
- Where necessary, scarify topsoil before seeding in order to prevent compaction or crusting. Leave soil in a roughened condition until it is seeded to prevent wind erosion;
- Hydromulch slopes steeper than 15 percent;
- Install water bars to divert run-off from disturbed area;
- Backfill immediately after pipeline is placed in trenches;
- Consult with members of the ID Team for technical assistance in avoiding, minimizing and monitoring for lost or degraded water resource values; and
- Project related sand and gravel pits will comply with all federal and state regulations.

Water Resources and Water Quality

- Stream crossings in the project area would conform to state and federal standards;
- Place silt barriers to control sediment on slopes in excess of five percent at stream crossings and adjacent wetlands;
- Stockpile soil from trenches out of the water and waterway crossings and replace after pipeline construction;
- Select stream crossing sites where the channel is relatively stable and not side-cutting;
- Construct stream crossings perpendicular to the axis of the stream channel;
- The ID Team would identify stream crossings that require under-boring. Typically, perennial streams and wetlands would be under-bored. These streams would be under-bored unless the ID Team's review of geologic data determines boring would be unfeasible;
- Open-trench methods would occur on those streams that could be trenched and reclaimed during a period in which water is not flowing or present within the stream;
- Restore original streambank contours;
- Service and refuel construction equipment at least 250 feet from all waterbodies and wetlands;
- Consult with members of the ID Team for technical assistance in avoiding, minimizing, and monitoring for lost or degraded water resource values;
- Obtain state and federal streambank permit and comply with any additional requirements outlined by agencies;
- The mitigation standards for adverse effects to existing surface and groundwater users are established in state of Montana statutes governing water rights. In summary, new water development is not allowed to adversely affect a prior appropriator to any degree. Adverse effects to surface and groundwater users will be addressed in the water right permitting process. If any adverse effects are identified they will be resolved before a water right permit is issued; and

- Monitoring of potentially affected surface waters and springs will be investigated on a case-by-case basis during the water right permitting process. Some monitoring in the Utica area is already planned based on the water right permit for the well at that location. It is possible that additional monitoring could be identified in relation to development of additional wells. The distance from where a well is located to where a spring may be monitored will be based on technical evaluation of the hydrogeological conditions. This evaluation will consider the magnitude of the CMRWA water development and the ability to measure associated depletions. The CMRWA plans to permit a total of 1,220 acre-feet of water, which equates to a continuous flow rate of 1.7 cubic feet per second (cfs).

Vegetation

- Minimize disturbance to sagebrush (*Artemisia* spp.) plants. In the event sagebrush plants are removed or killed, plants would be reestablished through seeding or replanting;
- Reseed disturbed native grassland with a native seed mix and rate approved by the ID Team in order to ensure rapid revegetation;
- Broadcast seed where appropriate in order to minimize visual impacts;
- Identify areas of noxious weed infestation located within or adjacent to disturbance areas and treat prior to disturbance activities;
- Prepare and submit a noxious weed control plan to each county weed district prior to construction activities;
- Construction equipment will have mufflers and spark arresters to reduce fire risk;
- Consult with members of the ID Team for technical assistance in avoiding, minimizing, and monitoring for lost or degraded vegetation values; and
- Control weeds within pipeline corridor on an on-going basis as part of regular operation and maintenance.

Wetlands

Wetlands are protected under Section 404 of the Clean Water Act; therefore, disturbance to wetlands will be avoided whenever possible, per Executive Order 11990. In the event that impacts to wetlands cannot be avoided, the following mitigation compensation measures would be followed:

- Wetlands would be delineated and the functions and values would be assessed by a qualified wetland biologist and a 404 permit would need to be obtained for all jurisdictional wetlands;
- Temporary supporting platforms would be used when working in wetlands to minimize damage to the wetland;
- Silt barriers would be used when disturbance areas occur adjacent to wetlands in order to control sediment;
- In the event that wetlands were disturbed or excavated, hydric soils would be stockpiled and the soil horizon would be redeveloped upon completion of construction;
- If pipeline profiles indicate draining of a wetland, bentonite plugs would be installed around the pipe on both sides of the wetland;
- Disturbed wetlands would be restored to original contour; and
- Restored wetlands would be monitored for three years post-construction to ensure that the functional capacity of the wetland was restored.
- Wetland crossings will be directionally bored or drilled where feasible to mitigate/limit impact.

Fish and Wildlife

- Aquatic resources for fish and wildlife would be protected by the implementation of Water Resources and Water Quality mitigation measures. All perennial streams and wetlands would be under-bored. These streams would be under-bored unless the ID Team's review of geologic

data determines boring would be unfeasible. When open-trench methods are used, they would be conducted during a period in which there is no water present in the stream and construction and reclamation activities would be completed prior to water returning to the system;

- Appropriately timed pre-construction surveys will be conducted to identify fish and wildlife habitat to be avoided;
- Consult members of the ID Team for technical assistance in avoiding, minimizing, and monitoring for lost or degraded fish and wildlife resources;
- No construction activities would be allowed within 2 miles of a sharp-tailed grouse (*Tympanuchus phasianellus*) or a greater sage-grouse (*Centrocercus urophasianus*) lek during periods of breeding or nesting (March 15 through June 15);
- Minimize disturbance to sagebrush plants. In the event sagebrush plants are removed or killed, plants would be reestablished through seeding or replanting; and
- All newly constructed power lines would be in compliance with the Avian Power Line Interaction Committee (APLIC) *Suggested Practices on Power Lines: The State of the Art in 2006* (APLIC, 2006) in order to avoid impacts to raptors.

Species of Concern and Federally Listed Species

- The Montana Fish, Wildlife and Parks (MTFWP), Montana Natural Heritage Program (MTNHP), and the USFWS would be consulted regarding the proposed activities to ensure that no unacceptable impacts to species of concern, threatened, endangered, candidate, or proposed species or their habitat occur.

Social and Economic

- Traffic and maintenance of traffic flow would be a high priority during any construction activities within the highway ROW. Disruptions of traffic would be kept to a minimum ensuring less than a 10 minute delay. All crossings or construction within ROWs would require permit/permission of appropriate federal, state, or county agency;
- Pipeline design would ensure that any potential pipeline breaks would not endanger adjacent roads; and
- As the pipeline is developed, residents and landowners will have an opportunity to receive water from the supply system wherever it is feasible.

Cultural Resources

As suggested by Reclamation and the SHPO, cultural resources would be protected by implementing the following mitigation measures:

- If disturbance activities are to occur within an area that has never previously been disturbed, a cultural resource investigation would be conducted prior to disturbance during the design phase.
- In the event that a cultural resource is discovered during construction, construction in the discovery area will be suspended and Reclamation and any other appropriate authorities, including the State Historic Preservation Officer (SHPO) and/or Tribal Historic Preservation Officer (THPO), will be notified to determine the nature of the discovery. Depending on the nature of the discovery, additional cultural resource inventory and/or mitigation may be necessary. Reclamation will consult with the SHPO and/or THPO and any other appropriate authorities to determine this.

Paleontological Resources

- In the event a paleontological resource is discovered during construction, construction in the discovery area will be suspended and Reclamation and any other appropriate authorities will be notified to determine the nature of the discovery. Depending on the nature of the discovery, additional inventory and/or mitigation may be necessary.

Hazardous Materials

- Prior to ground disturbing activities, records would be reviewed to identify any pipelines, Underground Storage Tanks, Leaking Underground Storage Tanks, or any other potential sources of hazardous material. Hazardous material features would not be disturbed during construction activities;
- If contaminated soils/sites are unexpectedly encountered during construction, construction would cease immediately and a qualified hazardous material professional would be consulted to ensure compliance with applicable laws, rules, and regulations. As appropriate, the Montana Department of Environmental Quality (MDEQ), EPA, and the MDT will be contacted and consulted;
- CMRWA would ensure that all contractors have a spill prevention and clean-up plan to minimize potential for effects; and
- Construction materials would be provided from state of Montana approved existing gravel sources and no new resource exploration will likely be required.

REFERENCES

Great West Engineering. (2010). Phase II Feasibility Report, Musselshell-Judith Rural Water System. Helena, MT.