Environmental Assessment

Central Montana Regional Water Authority Public Water System Project

March 2007

Central Montana Regional Water Authority
Draft Environmental Assessment and
MEPA Checklist

PART I. PROPOSED ACTION DESCRIPTION

1.1 Type of proposed action:

The Central Montana Regional Water Authority, Public Water System Project has a proposal to eventually construct several deep wells that will tap into the Madison groundwater formation. Water will be pumped from the wells and delivered by pipeline to participating central Montana communities. This EA was precipitated by the water right permit application, and at this time, only one well has been drilled. This first well will not adequately service all the communities (water quantity wise), and there are other wells projected. At this time, the water supply is not adequate to do everything the applicant is proposing. This EA is only for the initial well.

1.2 Agency authority for the proposed action:

The Montana Legislature enacted statute 85-2-301 MCA, which authorizes the DNRC to issue permits for new uses of water.

1.3 Name of project:

Central Montana Regional Water Authority, Public Water System Project.

1.4 Name, address and phone number of project sponsor:

Central Montana Regional Authority (CMRWA), PO Box 251, Hobson, MT 59452**.** Phone: 406 423-5428

1.5 Construction Timeline:

Estimated Completion Date: December 2018
Current Status of Project Design (% complete): 2%, one well has been drilled and tested and the consultant is at present, preparing an appraisal report.

1.6 Location affected by proposed action:

The proposed well location is the SWNWSW Section 16, T14N, R13E, Judith Basin County which is the location of the point of diversion. Pipelines will deliver water to the place of use which includes communities in Fergus, Judith Basin, Wheatland, Golden Valley, Musselshell and Yellowstone Counties.

1.7 Listing of any other Local, State or Federal agency that has overlapping or additional jurisdiction.

(a) Permits: All permits will be obtained prior to applicable project construction.

Agency Name	Permit
Montana Dept of Fish, Wildlife & Parks	SPA 124 (if required)
MT Association of Cons. Districts	310 (if required)
Montana Dept of Environmental Quality	318 (if required)

US Corps of Engineers	Section 404 (if required)
Local Communities	Floodplain Permits

(b) Funding:

Agency Name	Funding Amount
DNRC Coal Board	$ 500,000
Treasure State Endowment	$210,000
Other funding as yet undetermined.	

(c) Other Overlapping or Additional Jurisdictional Responsibilities:

Agency Name	Type of Responsibility
State Historic Preservation Office	Cultural Resource Protection

1.8 Narrative summary of the proposed action or project including the benefits and purpose of the proposed action:

The Central Montana Regional Water Authority, Public Water System Project is a proposal to construct a deep well that will tap into the Madison groundwater formation. Water will be pumped from the well and delivered by pipeline to participating central Montana communities for use as a public water supply.

The participating communities typically have their own water sources and distribution systems and often the water is of poor quality and/or the water quantity is not sufficient to meet their needs. The communities along the Musselshell River continually struggle to provide adequate good quality water for household purposes. The individual water treatment systems of all the communities could be replaced by a single system that would provide high quality water from a deep aquifer the appears to contain an abundance of water.

This EA does not address all the potential impacts of the distribution system or the impacts of other wells that might be constructed in the future. A future EA will be prepared prior to the design phase of the project that will fully address all potential impacts.

PART II. ENVIRONMENTAL REVIEW

2.1 Description and analysis of reasonable alternatives (including the no action alternative) to the proposed action whenever alternatives are reasonably available and prudent to consider and a discussion of how the alternatives would be implemented:

Alternative A: No Action

If no action is taken, the communities involved will have to look for other solutions to their water quality and water quantity problems. There may not be any adequate alternative supplies for some communities other than the regional water system. The various sources of water serving the communities involved are generally considered lower quality for domestic purposes and some communities occasionally experience a lack in water quantity to meet all their needs.

Alternative B: Proposed Action

Note: a detailed evaluation of the Proposed Action is included in Part V. The Environmental Review Checklist begins on page 5.

In the preferred Alternative, the well and distribution system will be constructed. This alternative would replace deteriorating individual community water treatment systems with a single system that meets current design and water-quality safety standards. This alternative would allow the applicant to develop a well that has the potential to supply at least a portion of the necessary potable water to the communities.

2.2 Evaluation and listing of mitigation, stipulation, or other control measures enforceable by the agency or another government agency:

There are no formal stipulations of mitigation or other controls associated with the proposed action at this time. This action does not involve any permits or granting of a license on which stipulations would be placed.

PART III. PUBLIC PARTICIPATION

3.1 Describe the level of public involvement for this project if any, and, given the complexity and the seriousness of the environmental issues associated with the proposed action, is the level of public involvement appropriate under the circumstances?

One public meeting was held in Hobson, Montana on August 3, 2005 to inform local citizens and concerned water users about the project (this meeting was not for MEPA scoping purposes). The CMRWA holds monthly board meetings which are locally advertised in advance and are open to the public.

Public notice for the water right application has been completed. This EA will be posted on the DNRC web page at **www.dnrc.mt.gov/wr_ea/default.asp**

Duration of comment period:

Comments will be accepted until April 30, 2007. This level of public involvement is appropriate for this scale of project.

PART IV. EA PREPARATION

4.1 Based on the significance criteria evaluated in this EA, is an EIS required? If an EIS is not required, explain why the EA is the appropriate level of analysis for this proposed action.

Based on an evaluation of the primary, secondary, and cumulative impacts to the physical and human environment under the Montana Environmental Protection Act (MEPA), this environmental review found no significant impacts from the proposed project. In determining the significance of the impacts, the DNRC assessed the anticipated severity, duration, geographic extent, and frequency of the impact, the probability that the impact would occur or reasonable assurance that the impact would not occur, growth-inducing or growth inhibiting aspects of the impact, the importance to the state and to society of the environmental resource or value affected, and precedent that would be set as a result of the proposed action that would commit the DNRC to future actions; and potential conflicts with local, state or federal laws. Therefore, an EA is the appropriate level of review at this time and an EIS is not required.

However, this EA does not include a comprehensive analysis of all the impacts that might be associated with the eventual development of the entire Central Montana Public Water System. A more in-depth EA will be completed before project construction, after engineering studies are complete and prior to the design stage. Because federal funding will likely be involved, this EA will likely be written to comply with the National Environmental Policy Act as well as MEPA. It will also be available for public review and comment.

4.2 Name, title, address and phone number of the person(s) responsible for preparing the EA:

Sterling Sundheim
DNRC, Water Resources Division
Lewistown Regional Office
613 NE Main Street
Lewistown, MT 59457
406 538-7459

4.3 List of agencies consulted during preparation of the EA:

Montana Department of Fish, Wildlife & Parks

Montana State Historic Preservation Office (SHPO) (a request for a cultural resource file will be made at the time the next EA is prepared)
Montana Natural Heritage Program – Natural Resources Information System (NRIS)
Montana Department of Environmental Quality
Montana Department of Natural Resources and Conservation
U.S. Army Corps of Engineers

PART V. ENVIRONMENTAL REVIEW CHECKLIST

5.1 Evaluation of the impacts of the Proposed Action including secondary and cumulative impacts on the Physical and Human Environment.

A. PHYSICAL ENVIRONMENT

1. LAND RESOURCES **Will the proposed action result in:**	**IMPACT ∗**				**Can Impact Be Mitigated ∗**	**Comment Index**
	Unknown ∗	**None**	**Minor ∗**	**Potentially Significant**		
a. ∗∗Soil instability or changes in geologic substructure?			X			1a.
b. Disruption, displacement, erosion, compaction, moisture loss, or over-covering of soil, which would reduce productivity or fertility?			X			1b
c. ∗∗Destruction, covering or modification of any unique geologic or physical features?		X				1c.
d. Changes in siltation, deposition or erosion patterns that may modify the channel of a river or stream or the bed or shore of a lake?		X				1d.
e. Exposure of people or property to earthquakes, landslides, ground failure, or other natural hazard?		X				
f. Other:		X				

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (attach additional pages of narrative if needed):

1a. There may be minor, temporary changes in soil stability during pipeline construction.

1b. Soil would be disturbed during construction of the pipelines, which may cause some erosion, compaction, moisture loss and over-covering of soil, but the areas affected would be small and the effects would likely be minor. All disturbed areas would be reclaimed and reseeded upon project completion.

1c. No unique geologic features would be destroyed, covered, or modified by the proposed action.

1d. No changes to deposition patterns will occur.

The no action alternative would have no impacts.

2. AIR ***Will the proposed action result in:***	***IMPACT ∗***				***Can Impact Be Mitigated ∗***	***Comment Index***
	Unknown ∗	***None***	***Minor ∗***	***Potentially Significant***		
a. ∗∗Emission of air pollutants or deterioration of ambient air quality? (Also see 13 (c).)			*X*			*2a.*
b. Creation of objectionable odors?		*X*				*.*
c. Alteration of air movement, moisture, or temperature patterns or any change in climate, either locally or regionally?		*X*				
d. Other:		*X*				

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Air Resources (attach additional pages of narrative if needed):

2a. Minor and temporary dust and vehicle emissions will be created by heavy equipment during construction, but would end after completion of the project.

The no action alternative would have no impacts.

3. WATER **Will the proposed action result in:**	**IMPACT ∗**				**Can Impact Be Mitigated∗**	**Comment Index**
	Unknown ∗	**None**	**Minor ∗**	**Potentially Significant**		
a. ∗Discharge into surface water or any alteration of surface water quality including but not limited to temperature, dissolved oxygen or turbidity?			X			3a.
b. Changes in drainage patterns or the rate and amount of surface runoff?		X				
c. Alteration of the course or magnitude of floodwater or other flows?		X				
d. Changes in the amount of surface water in any water body or creation of a new water body?			X			
e. Exposure of people or property to water related hazards such as flooding?		X				
f. Changes in the quality of groundwater?		X				
g. Changes in the quantity of groundwater?			X			3g.
h. Increase in risk of contamination of surface or groundwater?		X				
i. Effects on any existing water right or reservation?			X			3i
j. Effects on other water users as a result of any alteration in surface or groundwater quality?			X			3j
k. Effects on other users as a result of any alteration in surface or groundwater quantity?			X			3k
l. Other:		X				

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Water Resources (attach additional pages of narrative if needed):

3a. 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. The increase would be temporary and non-significant. Potential impacts are greatly minimized by timing construction in the fall of the year when most small streams are dry. When any flowing streams are encountered a boring process will most likely be used to avoid the streambed entirely.

3d, g, i, j, k. See Appendix B for an assessment by Russ Levins, DNRC Hydrogeologist.

There is potential for minor impacts to nearby wells which are tapping the same formation and for surface water discharge points for the Madison formation. Surface impacts should be minimal as the effects of pumping will be diffused over a wide region. Water users should be able to reasonably exercise their water rights.

The no action alternative would have no impacts.

4. VEGETATION **Will the proposed action result in?**	**IMPACT ∗**				**Can Impact Be Mitigated ∗**	**Comment Index**
	Unknown ∗	**None**	**Minor ∗**	**Potentially Significant**		
a. Changes in the diversity, productivity or abundance of plant species (including trees, shrubs, grass, crops, and aquatic plants)?		X				
b. Alteration of a plant community?			X			4b.
c. Adverse effects on any unique, rare, threatened, or endangered species?		X				4c.
d. Reduction in acreage or productivity of any agricultural land?		X				
e. Establishment or spread of noxious weeds?			X			4e.
f. Other:		X				

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Vegetation (attach additional pages of narrative if needed):4a.

4b. Native plant communities generally will not be altered along the pipeline route because it will, for the most part, follow county road right-of ways. As disturbed areas are reseeded, the impacts will be short-term and minor.

4c. There are no documented observations of any threatened or endangered plants, or plant species of special concern within the proposed project site.

4e. An increase in noxious weeds may occur due to soil disturbance and equipment operation. Effects are negligible in the long-term because of reclamation and weed control implementation.

The no action alternative would have no impacts.

** 5. FISH/WILDLIFE Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Deterioration of critical fish or wildlife habitat?			X			5a.
b. Changes in the diversity or abundance of game animals or bird species?		X				
c. Changes in the diversity or abundance of non-game species?		X				
d. Introduction of new species into an area?		X				
e. Creation of a barrier to the migration or movement of animals?		X				
f. Adverse effects on any unique, rare, threatened, or endangered species?	X					5f.
g. Increase in conditions that stress wildlife populations or limit abundance (including harassment, legal or illegal harvest or other human activity)?		X				
h. Other:		X				

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Fish and Wildlife (attach additional pages of narrative if needed):

5a. Pipelines will be located in existing county road rights-of-way. Perennial streams will be crossed by means of boring. Any damage to dry channels will be minor and temporary and will be immediately repaired.

5f. There are several threatened or endangered wildlife species, or wildlife species of special concern identified as expected to occur in the *counties* within the proposed project site. This will be addressed further in the pre-construction EA. Please see Appendix C for further information including a listing of species of concern and comments from the DFWP.

The no action alternative would have no impacts.

B. HUMAN ENVIRONMENT

6. NOISE/ELECTRICAL EFFECTS Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Increases in existing noise levels?			X			6a.
b. Exposure of people to severe or nuisance noise levels?		X				
c. Creation of electrostatic or electromagnetic effects that could be detrimental to human health or property?		X				
d. Interference with radio or television reception and operation?		X				
e. Other:		X				

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Noise/Electrical Effects (attach additional pages of narrative if needed):

6a-b. There will be a temporary increase in noise level during construction. This would end after completion of the project.

The no action alternative would have no impacts.

7. LAND USE **Will the proposed action result in:**	**IMPACT ∗**				**Can Impact Be Mitigated ∗**	**Comment Index**
	Unknown ∗	**None**	**Minor ∗**	**Potentially Significant**		
a. Alteration of or interference with the productivity or profitability of the existing land use of an area?			X			7a.
b. Conflict with a designated natural area or area of unusual scientific or educational importance?		X				7b
c. Conflict with any existing land use whose presence would constrain or potentially prohibit the proposed action?		X				
d. Adverse effects on or relocation of residences?		X				
e. Increase regulatory restrictions on private property?			X			7e
f. Other:		X				

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Use (attach additional pages of narrative if needed):

7a. The well-head location will require fencing a very small area (1/4 acre at most) out of a State owned pasture that is leased for grazing purposes.

7b. None known at this time.

7e. Buildings will not be allowed to be constructed over the buried pipelines. However, the intention is to have the pipelines located within the existing county roads right-of-way. There may be instances where the project might not be able to be contained in the right-of-way in which case a restriction may affect private property.

The no action alternative would have no impacts.

8. RISK/HEALTH HAZARDS Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Risk of an explosion or release of hazardous substances (including, but not limited to oil, pesticides, chemicals, or radiation) in the event of an accident or other forms of disruption?			X			8a.
b. Affect an existing emergency response or emergency evacuation plan, or create a need for a new plan?		X				
c. Creation of any human health hazard or potential hazard?		X				.
d. Other:		X				8d

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Risk/Health Hazards (attach additional pages of narrative if needed):

8a. The proposed project will most likely include the use of either liquid bleach, sodium hypochlorite or chlorine gas. All DEQ guidelines/regulations will be strictly followed in their use and their storage.

8d. CMRWA will have to conform to public drinking water supply standards

The no action alternative would have no impacts.

9. COMMUNITY IMPACT Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Alteration of the location, distribution, density, or growth rate of the human population of an area?			X			9a
b. Alteration of the social structure of a community?			X			9b
c. Alteration of the level or distribution of employment or community or personal income?			X			9c
d. Changes in industrial or commercial activity?			X			9d
e. Increased traffic hazards or effects on existing transportation facilities or patterns of movement of people and goods?			X			9e
f. Other:		X				

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Community Impact (attach additional pages of narrative if needed):

9a-d. This action may encourage a slight population growth.

9e. Effects on transportation will be minimal and short term.

The no action alternative would have no impacts.

10. PUBLIC SERVICES/TAXES/UTILITIES Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Will the proposed action have an effect upon or result in a need for new or altered governmental services in any of the following areas: fire or police protection, schools, parks/recreational facilities, roads or other public maintenance, water supply, sewer or septic systems, solid waste disposal, health, or other governmental services? If any, specify:			X			10a.
b. Will the proposed action have an effect upon the local or state tax base and revenues?		X				10c
c. Will the proposed action result in a need for new facilities or substantial alterations of any of the following utilities: electric power, natural gas, other fuel supply or distribution systems, or communications?			X			10d
d. Will the proposed action result in increased use of any energy source?		X				
e. Define projected revenue sources						10e.
f. Define projected maintenance costs.						10f.
g. Other:		X				

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Public Services/Taxes/Utilities (attach additional pages of narrative if needed):

10a. The proposed action will enhance quality and quantity of water for community water supply systems.

10c-d. There will be some utility needs to provide a power supply for lift stations.

10e. The cost of the project is projected at $100,000,000. Money for this project would come from many different sources.

10f. All routine maintenance and operating costs associated with the CMRWA are the responsibility of the CMRWA. Lower maintenance costs are expected as compared to maintaining existing older water treatment facilities.

The no action alternative would have no impacts.

** 11. AESTHETICS/RECREATION Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Alteration of any scenic vista or creation of an aesthetically offensive site or effect that is open to public view?		X				
b. Alteration of the aesthetic character of a community or neighborhood?		X				
c. Alteration of the quality or quantity of recreational/tourism opportunities and settings?		X				.
d. Will any designated or proposed wild or scenic rivers, trails or wilderness areas be impacted?		X				
e. Other:		X				

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Aesthetics/Recreation (attach additional pages of narrative if needed):

11 No impacts anticipated.

The no action alternative would have no impacts.

12. CULTURAL/HISTORICAL RESOURCES Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. **Destruction or alteration of any site, structure or object of prehistoric historic, or paleontological importance?		X				12a.
b. Physical change that would affect unique cultural values?		X				12b
c. Effects on existing religious or sacred uses of a site or area?		X				12c.
d. Will the project affect historic or cultural resources?		X				12d.
e. Other:		X				

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Cultural/Historical Resources (attach additional pages of narrative if needed):

12a-d. The proposed project will not result in the destruction, disturbance or alteration of any known site, structure, or object of prehistoric, cultural, religious, sacred, historic or paleontological importance. Construction will take place in existing county road/state highway right-of-ways. Any cultural site identified in the cultural resource file search will be avoided or mitigated. More detail will be provided for this topic in the pre-construction EA.

The no action alternative would have no impacts.

SIGNIFICANCE CRITERIA

13. SUMMARY EVALUATION OF SIGNIFICANCE Will the proposed action, considered as a whole:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Have impacts that are individually limited, but cumulatively considerable? (A project or program may result in impacts on two or more separate resources that create a significant effect when considered together or in total.)			X			13a.
b. Involve potential risks or adverse effects, which are uncertain but extremely hazardous if they were to occur?		X				
c. Potentially conflict with the substantive requirements of any local, state, or federal law, regulation, standard or formal plan?		X				
d. Establish a precedent or likelihood that future actions with significant environmental impacts will be proposed?		X				
e. Generate substantial debate or controversy about the nature of the impacts that would be created?		X				
f. Is the project expected to have organized opposition or generate substantial public controversy?		X				

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Significance Criteria (attach additional pages of narrative if needed):

13a. This EA found no significant impacts to the human or physical environment from the proposed action, except for a potentially significant positive impact of providing co-operating communities with a dependable high quality water supply.

The no action alternative would have no impacts.

PART VI. NARRATIVE EVALUATION AND COMMENT

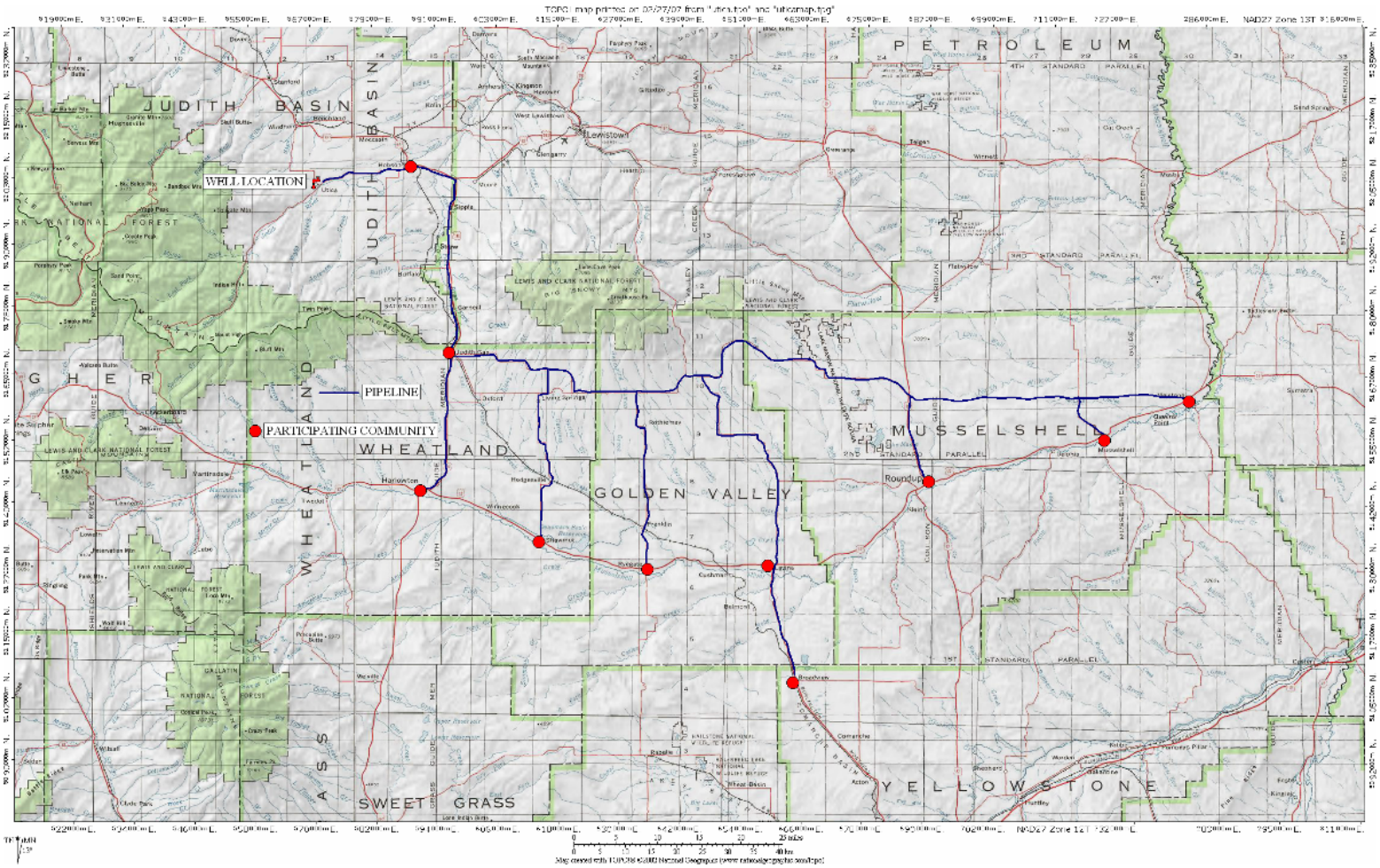
This EA did not reveal any significant negative impacts to the physical and human environment stemming from the proposed action. It found that there would be a low likelihood that any threatened or endangered species would be affected, and unique or sensitive physical, cultural or historic features would be disturbed. The impacts associated with the actual construction will be short-term and end with the completion of the project if adequate construction and reclamation measures are implemented. Impacts associated with potential weed proliferation will need to be mitigated by reclamation, weed control efforts and the implementation of best management practices. The long-term public benefits, including enhanced public water supplies, outweigh any short-term, temporary negative impacts.

None of the identified impacts are significant as defined in ARM 36.2.524.

A more thorough EA will be prepared and made available for public comment when engineering feasibility studies and National Environmental Policy Act analyses are completed.

Appendix A

Site Plan (Preliminary)



Appendix B

Affects on Water Resources (section 5.1.A.3 g, i and k)

The Madison Aquifer consisting of limestone and dolomite of the Lodgepole and Mission Canyon formations of the Mississippian age Madison Group is the source of water for the CMRWA well. The Charles Formation of the Madison Group and the Big Snowy Group overlie the Madison Aquifer and acts as a confining layer. Regionally, water recharges the Madison Aquifer in central Montana, the Bighorn Mountains in Wyoming, and the Black Hills in South Dakota and flows north and northeast to discharge areas in eastern North Dakota and southern Manitoba and Saskatchewan (Downey, 1984). Water infiltrates where streams cross outcrops of the Madison Aquifer in the Big Snowy and Little Belt Mountains where limestone has been dissolved to form solution openings and caverns. Solution openings and caverns created at the surface in the past are mostly filled after burial by collapse, infilling by younger sediments, or by mineral precipitation. Consequently, the ability of the aquifer to transmit water decreases away from the mountain recharge areas (Huntoon, 1985; Downey, 1984) and, as a result, most of the water that recharges the Madison Aquifer in central Montana is rejected and discharges to springs or shallower aquifers near recharge areas. Discharge from Big Springs near Lewistown averaged 107 cubic feet per second (cfs) from 1933 to 1957 and Giant Springs near Great Falls has been estimated to be 600 cfs (Feltis, R.D. 1973; Meinzer, O.E. 1927). Both of these springs are fed by discharge from the Madison Aquifer. In addition, there no doubt are numerous other springs or discharges fed by the Madison Aquifer. For comparison, Downey (1984) used a numerical computer model to predict that 17 cfs from recharge areas in central Montana contribute to the regional flow system in the Madison Aquifer.

Western Groundwater Services as a consultant for CMRWA reports transmissivity values for the Madison Aquifer ranging from 76 to 790 ft^2/day and estimates aquifer storativity of 0.00005. Using this storativity and the geometric mean transmissivity of 315 ft^2/day, detectible drawdown is predicted to extend 19 miles from the CMRWA well in one year of continuous pumping. The effects of pumping on ground-water levels will continue to expand in subsequent years until the amount of water discharging the aquifer though springs or other means is reduced to offset the new use (Theis, 1938; Theis, 1940). Leakage from overlying and/or underlying aquifers induced by pumping the Madison Aquifer may slow propagation of drawdown away from the CMRWA well and delay the effects on surface discharges. In addition, the effects may be distributed over numerous springs or other discharge points across the Judith Basin or concentrated more locally. Therefore, the timing and location of the effects of the CMRWA well on aquifer discharge are very uncertain and nearly impossible to determine.

References

Downey, J.S. 1984. Geohydrology of the Madison and associated aquifers in parts of Montana, North Dakota, South Dakota, and Wyoming. U.S. Geological Survey Professional Paper 1273-G, 47 pp, 1 plate.

Feltis, R.D. 1973. Geology and water resources of eastern part of Judith Basin, Montana. Montana Bureau of Mines and Geology Bulletin 87, 51 pp.

Huntoon, P.W. 1985, Rejection of recharge water from Madison Aquifer along eastern perimeter of Bighorn Artesian, Basin, Wyoming. *Ground Water*, Vol. 23, No. 3. p. 345-353.

Meinzer, O.E. 1927. Large springs in the United States. U.S. Geological Survey Water-Supply Paper 557, 94 pp.

Theis, C.V., 1938. The significance and nature of the cone of depression in ground-water bodies, *Economic Geology*, pp. 889-902.

Theis, C.V., 1940. The source of water derived from wells: essential factors controlling the response of an aquifer to development, *Civil Engineering*, V. 10, p. 277-280.

Appendix C

Affects on Fish/Wildlife (section 5.1.A.5.f)

United States Department of the Interior
FISH AND WILDLIFE SERVICE
MONTANA FIELD OFFICE
585 Sheppard Way
HELENA, MT 59601
PHONE (406) 449-5225, FAX (406) 449-5339

ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES
MONTANA COUNTIES*
Endangered Species Act

November 2006

C = Candidate
LT = Listed Threatened
LE = Listed Endangered
PCH = Proposed Critical Habitat
CH = Designated Critical Habitat
XN = Experimental non-essential population

*Note: Generally, this list identifies the counties where one would reasonably expect the species to occur, not necessarily every county where the species is listed.

COUNTY	SCIENTIFIC NAME	COMMON NAME	STATUS
FERGUS	*Scaphirhynchus albus*	Pallid Sturgeon	LE
	Haliaeetus leucocephalus	Bald Eagle	LT
	Mustela nigripes	Black-footed Ferret	LE
GOLDEN VALLEY	*Haliaeetus leucocephalus*	Bald Eagle	LT
	Mustela nigripes	Black-footed Ferret	LE
JUDITH BASIN	*Haliaeetus leucocephalus*	Bald Eagle	LT
	Lynx canadensis	Canada Lynx	LT
MUSSELSHELL	*Haliaeetus leucocephalus*	Bald Eagle	LT
	Mustela nigripes	Black-footed Ferret	LE
WHEATLAND	*Haliaeetus leucocephalus*	Bald Eagle	LT
	Mustela nigripes	Black-footed Ferret	LE
	Lynx canadensis	Canada Lynx	LT
YELLOWSTONE	*Haliaeetus leucocephalus*	Bald Eagle	LT
	Mustela nigripes	Black-footed Ferret	LE
	Grus americana	Whooping Crane	LE

Appendix C, continued

Affects on Fish/Wildlife (section 5.1.A.5.f)

Below are the Creeks of interest in Region 5 (Yellowstone, Musselshell, Golden Valley and Wheatland Counties) as well as their associated species. The northern redbelly dace and hybrid are the only species of concern found in the area. However, there is a large population of spiny softshell turtles on the Musselshell and some of the tributaries coming in from the south. See paragraph below on Musselshell.

Roberts Creek - lake chub
East Fork Roberts Creek - Northern redbelly dace and hybrids, white sucker, fathead minnow, brassy minnow, long nose dace, boreal chorus frog

Antelope Creek - fathead minnow, tiger salamander, boreal chorus frog, northern redbelly dace and hybrid, lake chub, white sucker

Painted Robe Creek - brassy minnow, northern redbelly dace and hybrid, tiger salamander, western painted turtle, carp, leopard frog, spotted frog,

Currant Creek - lake chub, northern redbellly dace and hybrid, fathead minnow, white sucker, painted turtle, longnose dace

Merrills Springs Creek - lake chub, longnose dace, common gartersnake

Swimming Woman Creek - northern leopard frog, painted turtle, northern red bellyd ace, brassy minnow, fathead minnow, whote sucker, hybrid dace, common gartersnake, crayfish

North Willow Creek - plains minnow, brassy minnow, green sunfish, white sucker, common carp, painted turtle, balck bullhead, sand shiner, fathead minnow

Big Coulee Creek - common carp, longnose dace, lake chub, northern redbelly dace and hybrid, fathead minnow, brassy minnow, white sucker, smallmouth bass, spiny softshell turtle, painted turtle, common gartersnake, gophersnake, northern leopard frog, Woodhouse's toad

Musselshell River - We have recorded at least 20 species of fish on the Musselshell. Of possible importance are three large congregation points (nesting/breeding) for spiny softshell turtles, a species of concern. These locations may hold a large percentage of the spiny softshell turtle population on this part of the Musselshell and should be avoided, especially during particular times of the year. We do not know much yet about the use of these sites by the turtles. The locations are at the mouth of Big Coulee Creek near Lavina, the mouth of Fish Creek near Ryegate and then further west near Shawmut.

Comments are from Ostovar Kayhan, Fisheries Technician, DFWP Region 5, personal email, February 12, 2007.

Appendix C, continued

Affects on Fish/Wildlife (section 5.1.A.5.f)

I have the following comments regarding the proposed Utica well pipeline route in Fergus and Judith Basin Counties.

1) Assuming a government entity is doing the permitting they will need a 124 permit for impacting the banks and bottom of any stream or its tributaries. For 124 permits an EA has to be done regarding impacts by the streams. Judith River, Ross Fork, Buffalo Creek, Olson Creek, Trout Creek are some of the stream crossings that may be needed. The Judith River is the most important and provides good trout fishing when water levels are decent. There will be timing restrictions on trout streams unless they are bored. Turbidity permits will be needed for the crossings. FWP can issue these permits for small projects. However, since this is a large project with many crossings it is likely they will need to get the turbidity permit from DEQ. Will also need COE 404 wetland permits.

2) We have limited fisheries data on some of the streams. Judith has Brown trout, rainbow and an occassional WCT in the project area. WCT is a species of concern. WCT are probably very rare in this reach. It has been a long time since the Judith has been sampled in this area. Drought has played a big role. In the last couple years we have sampled fish in Ross Fork and Buffalo Creek. They had similar species - Brassy minnow, fathead minnow, lake chub, longnose dace, mottled sculpin, northern red belly dace and northern redbelly dace hybrid, white sucker were observed in one or both streams. The hybrid dace is a species of concern and was in both streams.

Comments are from Anne Tews, Fisheries Biologist, DFWP, Lewistown, MT, personal email, February 12, 2007.