



**Montana Department of**  
**ENVIRONMENTAL QUALITY**

Brian Schweitzer, Governor  
Richard H. Opper, Director

P.O. Box 200901 • Helena, MT 59620-0901 • (406) 444-2544 • [www.deq.mt.gov](http://www.deq.mt.gov)

March 15, 2012

Shawna Verdi, President,  
River Rock County Water and Sewer District  
265 North River Rock Drive  
Belgrade, Montana 59714

RE: River Rock Water and Sewer District  
Wastewater Treatment Facility Improvements  
WPCSRF Program #: C302224

Dear Shawna,

Enclosed are copies of the Finding of No Significant Impact (FONSI) and of the Environmental Assessment (EA) for the River Rock County Water and Sewer Wastewater Treatment Facility Improvement project. Please print the Finding of No Significant Impact in at least one publication of your local newspaper under legal advertising and return a copy of the proof of advertisement to this office. You do not have to print this letter or the EA.

We recommend that you advertise this as soon as possible and allow for a 30-day comment period. Please have the FONSI, EA, and the May 2010 Alternative Analysis Report available to the public at your office during the comment period. We have distributed the Notice to the enclosed list of agencies.

If you have any questions, please do not hesitate to contact me at (406) 444-5323.

Sincerely,

Jerry Paddock, P.E.  
Environmental Engineer  
Technical and Financial Assistance Bureau  
Phone: (406) 444-5323 Fax: (406) 444-6836

Encl. Agency List

Cc: Marty Gagnon, MMI, Bozeman



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March 15, 2012

## FINDING OF NO SIGNIFICANT IMPACT

### TO ALL INTERESTED GOVERNMENTAL AGENCIES AND PUBLIC GROUPS

As required by state and federal rules for determining whether an Environmental Impact Statement is necessary, an environmental review has been performed on the proposed action below:

Project	River Rock County Water & Sewer District Wastewater Treatment Facility Improvements
Location	Belgrade, Montana
Project Number	WPCSRF Project # C302224
Total Cost	\$5,144,000

The River Rock County Water & Sewer District (District), through its May 2010 Alternative Analysis for Wastewater Treatment Facility Improvements has identified the need to make significant changes to their wastewater treatment system. The District's current wastewater treatment facility (WWTF) utilizes three lagoon cells for treatment of the wastewater. Following treatment in either of the two primary cells, the treated wastewater can be directed into the third cell for further treatment or disposal, or into one of seven additional small infiltration/percolation (IP) cells. The primary cells are aerated and lined. The third cell is not aerated or lined; however, it can either be operated as a facultative treatment cell or as an IP cell. The 12-year old facility is operating at about 42% of its hydraulic design capacity of 0.374 million gallons per day (mgd).

The purpose of the proposed treatment facility upgrade is to meet discharge limits and compliance schedules for the District's recently issued Montana Ground Water Pollution Control System discharge permit. New discharge limits are now required for the effluent prior to discharge for total nitrogen, nitrate, BOD<sub>5</sub>, and *E. coli* bacteria, as well as groundwater compliance limits at two sampling/monitoring wells located in the mixing zone. The existing treatment system cannot provide the level of treatment required by the discharge permit, especially for the nitrate and *E. coli* limits.

To address the effluent and groundwater nitrate and *E. coli* limits, the wastewater treatment facility will be required to upgrade to an advanced wastewater treatment system. The District proposes construction of a new Membrane Bioreactor (MBR) facility in the footprint of the third (treatment/IP) cell. This method of construction will allow the two existing treatment cells to remain in operation during the MBR facility construction. The proposed MBR facility will consist of an influent and effluent flow measurement flumes, two fine screens (2-mm), washer/compactor and grit removal system, a package MBR system for biological treatment and clarification (anoxic/aeration basins and blower system), and an ultraviolet (UV) disinfection system.

All new components, except the anoxic and aeration basins, will be located in a new building. A small office and laboratory space will also be included in the building. All of the necessary biological tankage, membranes, and equipment (pumps, blowers, piping, etc.) will be designed and constructed to process an average daily flow of 0.20 mgd (about 22% more than average current flow). Additional equipment to meet the permitted flow (0.374 mgd) will be added at a future date, when needed. Treated wastewater will continue to be discharged to the seven existing rapid infiltration cells.

Upon completion of the new MBR facility, the two existing treatment cells will undergo minor modifications, including one for sludge stabilization and the other will serve as an equalization basin to trim peak loadings, which will help minimize sizing of the MBR equipment. The upgrade project also includes installing a non-potable water system to reuse plant effluent internally and a new generator for emergency backup power. The proposed improvements will produce a high quality effluent that will be capable of meeting the more restrictive nitrate and *E. coli* limits in the District's new discharge permit. All proposed improvements will be designed in accordance with Montana Department of Environmental Quality (DEQ) Circular DEQ-2 design standards for the treatment of wastewater.

Federal and State grant/loan programs will fund the project. Environmentally sensitive characteristics such as wetlands, floodplains, historical sites, and threatened or endangered species are not expected to be adversely impacted as a result of the proposed project. No significant long-term environmental impacts were identified. An environmental assessment (EA), which describes the project and analyzes the impacts in more detail, is available for public scrutiny on the DEQ web site (<http://www.deq.mt.gov/ea.mcp>) and at the following locations:

Jerry Paddock, P.E.  
Department of Environmental Quality  
1520 East Sixth Avenue  
P.O. Box 200901  
Helena, MT 59620-09011  
[jpaddock@mt.gov](mailto:jpaddock@mt.gov)

Shawna Verdi, President  
River Rock Water and Sewer District  
265 North River Rock Drive  
Belgrade, MT 59714

Comments on the EA may be submitted to the Department of Environmental Quality at the above address. After evaluating substantive comments received, the department will revise the environmental assessment or determine if an environmental impact statement is necessary. If no substantive comments are received during the comment period, or if substantive comments are received and evaluated and the environmental impacts are still determined to be non-significant, the agency will make a final decision. No administrative action will be taken on the project for at least 30 calendar days after release of the Finding of No Significant Impact.

Sincerely,



Todd Teegarden, Bureau Chief  
Technical and Financial Assistance Bureau

RIVER ROCK WASTEWATER TREATMENT IMPROVEMENTS  
RIVER ROCK WATER AND SEWER DISTRICT

ENVIRONMENTAL ASSESSMENT

I. COVER SHEET

A. PROJECT IDENTIFICATION

Applicant: River Rock County Water & Sewer District  
Address: 265 North River Rock  
Belgrade, MT 59714  
SRF Project Number: Project # C302224

B. CONTACT PERSON

Name: Shawna Verdi, President  
Address: 265 North River Rock  
Belgrade, MT 59714  
Telephone: (406) 388-7776

C. ABSTRACT

The River Rock County Water & Sewer District (District), through its May 2010 Alternative Analysis for Wastewater Treatment Facility Improvements (Alternative Analysis Report) has identified the need to make significant changes to their wastewater treatment system. The District's current wastewater treatment facility (WWTF) utilizes three lagoon cells for treatment of the wastewater. Following treatment in either of the two primary cells, the treated wastewater can be directed into the third cell for further treatment or disposal, or into one of seven additional small infiltration/percolation (IP) cells. The first two (primary) cells are aerated and lined. The third cell is not aerated or lined; however, it can either be operated as a facultative treatment cell or as an IP cell. The 12-year old facility is operating at about 42% of its hydraulic design capacity of 0.374 million gallons per day (mgd). The purpose of the proposed treatment facility upgrade is to meet discharge limits and compliance schedules for the District's recently issued Montana Ground Water Pollution Control System discharge permit. New discharge limits are now required for the effluent prior to discharge for total nitrogen, nitrate, BOD<sub>5</sub>, and *E. coli* bacteria, as well as groundwater compliance limits at two sampling/monitoring wells located in the mixing zone. The existing treatment system cannot provide the level of treatment required by the discharge permit, especially for the nitrate and *E. coli* limits.

To address the effluent and groundwater nitrate and *E. coli* limits, the wastewater treatment facility will be required to upgrade to an advanced wastewater treatment system. The District proposes construction of a new Membrane Bioreactor (MBR) facility in the footprint of the third (treatment/IP) cell. This method of construction will allow the two existing treatment cells to remain in operation during the MBR facility construction. The proposed MBR facility will consist of an influent and effluent flow measurement flumes, two fine screens (2-

mm), washer/compactor and grit removal system, a package MBR system for biological treatment and clarification (anoxic/aeration basins and blower system), and an ultraviolet (UV) disinfection system. All new components except the anoxic and aeration basins will be located in a new building. A small office and laboratory space will also be included in the building. All of the necessary biological tankage, membranes, and equipment (pumps, blowers, piping, etc.) will be designed and constructed to process an average daily flow of 0.20 mgd (about 22% more than average current flow). Additional equipment to meet the permitted flow (0.374 mgd) will be added at a future date, when needed. Treated wastewater will continue to be discharged to the seven existing rapid infiltration cells.

Upon completion of the new MBR facility, the two existing treatment cells will undergo minor modifications, including one for sludge stabilization and the other will serve as an equalization basin to trim peak loadings, which will help minimize sizing of the MBR equipment. The upgrade project also includes installing a non-potable water system to reuse plant effluent internally and a new generator for emergency backup power. The proposed improvements will produce a high quality effluent that will be capable of meeting the more restrictive nitrate and *E. coli* limits in the District's new discharge permit. All proposed improvements will be designed in accordance with Montana Department of Environmental Quality (DEQ) Circular DEQ-2 design standards for the treatment of wastewater.

The proposed improvements are estimated to cost approximately \$5,144,000 and will be primarily funded through a low interest loan from the State Revolving Fund (SRF) loan program. The District will also be providing some funds for the upgrade.

Environmentally sensitive characteristics such as wetlands, floodplains, threatened or endangered species and historical sites are not expected to be adversely impacted as a result of the proposed project. Additional environmental impacts related to land use, water quality, air quality, public health, energy, noise, growth, and sludge disposal were also assessed. No significant long-term environmental impacts were identified.

Under Montana law, (75-6-112, MCA), no person may construct, extend, or use a public sewage system until the DEQ has reviewed and approved the plans and specifications for the project. Under the Montana Water Pollution Control State Revolving Fund Act, the DEQ may loan money to municipalities for construction of public sewage systems.

The DEQ, Technical and Financial Assistance Bureau, has prepared this Environmental Assessment to satisfy the requirements of the Montana Environmental Policy Act (MEPA) and the National Environmental Policy Act (NEPA).

D. COMMENT PERIOD

Thirty (30) calendar days

## II. PURPOSE OF AND NEED FOR ACTION

The River Rock County Water & Sewer District (District) provides water and sewer services to the River Rock Subdivision. The configuration of the existing wastewater treatment facility (WWTF) can be seen in Figure 1. There are currently 1,035 wastewater service accounts in the service area, which include single family homes, condo units, and a school. Other than 12 undeveloped lots, no additional service hookups are expected unless the District expands their service area. The District is authorized to discharge to groundwater utilizing up to eight infiltration/percolation (IP) cells under Montana Ground Water Pollution Control System Permit No. MTX000147 (MGWPCS permit). The wastewater discharge has exceeded discharge limits for nitrate in the groundwater monitoring wells, which are located directly down gradient of the IP cells. Moreover, detections of fecal coliform and *E. coli* bacteria have also been found in the monitoring wells.

Requirements in the current permit (issued February 3, 2010), will require an upgrade of the existing WWTF to allow continued disposal to the IP cells, or they must find another method for effluent disposal. More specifically, the MGWPCS permit includes a nitrate limit of 10.3 mg/L and an *E. coli* limit of less than 1 colony forming unit (cfu)/100 ml, both of which exceeds the treatment capability of the existing WWTF. These limits are for samples taken from the two on-site monitoring wells. See wells MW-1 and MW-2 on Figure 1. This level of *E. coli* treatment can only be achieved using a membrane filter.

Additionally, the MGWPCS discharge permit includes a compliance schedule for upgrading the facility to meet the discharge permit requirements. The District feels they can best meet the compliance schedule with an alternative that utilizes a portion of the existing wastewater treatment area and disposal method. The new system must be fully operational by October 1, 2013.

## III. ALTERNATIVES INCLUDING THE PROPOSED ACTION

To meet the effluent and groundwater nitrate and *E. coli* limits required by the MGWPCS permit, the wastewater treatment facility must be upgraded or another effluent disposal method must be used. The District feels that if the construction occurs within the boundaries of the existing treatment site, the District can be more in control of meeting the compliance schedule.

A. Six alternatives for providing advanced wastewater treatment were evaluated in the Alternative Analysis Report. The treatment alternatives evaluated included:

- C-1 No Action
- C-2 Send Wastewater to the City of Belgrade
- C-3 Land Application of Effluent
- C-4 Lagoon Upgrades
- C-5 Activated Sludge (oxidation ditch or earthen basin)
- C-6 Membrane Bioreactor (MBR)

C-1 NO ACTION - The no-action alternative would result in the continued use of the District's two aerated lagoons and discharge to the infiltration/percolation (IP) cells. The permit requires the treatment facility

to have an 85% removal of CBOD<sub>5</sub>, discharged water must have a pH between 6.0-9.0, and total nitrogen loading of less than of 91.1 pounds per day (at an effluent flow rate of 374,000 gallons per day maximum flow). Because of the groundwater discharge aspect of the system, the permit also includes limits for *E. coli*, which must be less than 1 cfu per 100 mL, and for nitrate, which must be less than 10.3 mg/L, measured in wells MW-1 and MW-2.

Based on past treatment performance, the existing facility is not capable of treating the wastewater to the levels required in the discharge permit. Therefore, the no-action alternative would put the District in violation of their discharge permit. Based on these concerns, the no-action alternative was not considered to be a viable option for the District.

C-2 SEND WASTEWATER TO THE CITY OF BELGRADE – This alternative would consist of constructing a piping system to transport raw wastewater to the City of Belgrade. Several routes were considered and would require acquisition of easements or property and occupancy permits in right-of-ways. The pipeline would cross Interstate 90, railroad tracks and the several roads (including the Frontage Road to I-90). The wastewater connection to the city would relieve the District from operating their wastewater treatment, and avoid a new wastewater disposal system. Additionally, all future discharge (limit) requirements would be the responsibility of the City of Belgrade and not the District. The Belgrade treatment system may require upgrading before the District could connect because the system's capacity is an issue at this time and an in depth hydraulic analysis must be completed to determine if the point of connection to the city and downstream system has flow capacity. A city ordinance would require impact fees of \$1,489 per connection/residence. Moreover, a decision would have to be made if the River Rock subdivision would be annexed into the city or if the District connection would be on a contractual basis. Annexation to the city may include coordination of the water system, streets, open space and the River Rock Home Owners Association. Due to the physical distance between the sites, this could be an issue. This alternative has several unknown circumstances that could be difficult to overcome in the time frame allowed in the discharge permit compliance schedule.

C-3 LAND APPLICATION OF EFFLUENT – Land application (spray irrigation) of treated wastewater was considered in this alternative. Effluent would be pumped from the existing treatment facility to a storage pond and then pumped from the storage pond to the spray irrigation site. The spray irrigation site would require approximately 125 acres. Three agricultural sites were evaluated as potential areas for the spray irrigation system and ranged from just under 5,000 feet to just over 6,000 feet from the River Rock subdivision. All three sites would require the District to enter into a land lease agreement or to purchase the land. The storage area evaluated was located about 3,500 feet northwest of the River Rock subdivision and would have to be purchased by the District. Advantages to using treated wastewater for irrigation include the beneficial reuse of wastewater to irrigate a (harvestable) crop, and a reduction in the use of

water from wells or streams. The nutrients in the wastewater also reduce the need for the use of synthetic fertilizer. The concerns with this alternative include the requirement to pump the wastewater the long distances to the storage cell and irrigation sites, and there are unpredictable property purchase and lease negotiations, which may exceed the permit compliance requirement. Although the storage cell and irrigation site would not be located within the footprint of the existing treatment facility, the District felt they would be able to meet the compliance schedule of the discharge permit if this alternative was selected.

- C-4 LAGOON UPGRADES – The lagoon upgrade alternative would include improvements to the aeration system, the installation of dividing walls, and insulated covers to Cells 1 and 2 to promote nitrification. This alternative would also include the construction of a new post nitrification reactor to ensure that all ammonia is converted to nitrate/nitrite and a denitrification reactor to convert the nitrate/nitrite to nitrogen gas. These reactors would be constructed on a portion of existing third treatment cell. A filtration system would be installed to help remove any remaining solids from the effluent and an ultraviolet (UV) light system would be provided for disinfection. The filter would help remove some bacteria and viruses, which would optimize the UV disinfection. The ultraviolet (UV) system would be 100% redundant at peak hour flow.

A new treatment building would be constructed to enclose the new reactors, filtration membrane, and the UV system. The treatment building construction would require backfilling a portion of existing Cell 3 and three new IP cells would be made from the remainder of Cell 3, bringing the total of 10 IP cells. These improvements would improve treatment efficiency, especially in winter, for nitrogen removal. Final discharge would remain into the existing IP cells. Because this alternative could be constructed within the footprint of the existing treatment facility, the District could meet the compliance schedule outlined in the discharge permit.

- C-5 ACTIVATED SLUDGE (EARTHEN BASIN OR OXIDATION DITCH) – This alternative evaluated the use of traditional activated sludge technology to remove nitrogen and ultrafiltration for physical removal of solids and *E. coli* bacteria. Under this alternative, the nitrogen removal process included a bioreactor with an aeration zone for BOD removal and nitrification (conversion of ammonia to nitrite/nitrate) and an anoxic zone for denitrification (conversion of nitrate to nitrogen gas). Two secondary clarifiers would provide recycled activated sludge (RAS) to promote denitrification in the anoxic zone and effluent to the ultraviolet disinfection system for disposal to the IP cells. The bioreactor could be in the form of earthen basins, concrete basins, or a proprietary treatment package, such as a Bio-Wheel.

For this alternative evaluation, an oxidation ditch type of bioreactor was considered. Under this alternative, a new building would be constructed to house the screen, a washer/compactor, a grit removal system,

ultrafiltration (filters), and an ultraviolet (UV) disinfection system. A filtration system would be installed to help remove any remaining solids from the effluent and an ultraviolet (UV) light system would be provided for disinfection. The filter would help remove some bacteria and viruses, optimizing the UV disinfection. The ultraviolet (UV) system would be 100% redundant at peak hour flow. The bioreactor and treatment building would occupy a large portion (about half) of existing Cell 3 and would therefore require importing a large volume of fill material. In the event that *E. coli* is detected in the effluent, the existing lined treatment cells (Cells 1 and 2) could be used for temporary storage and the water re-treated once the treatment system is operational again. Undigested or unstabilized sludge would be placed in one of the existing lined treatment cells for additional treatment and at some future time, would be removed by a contractor specializing in sludge removal. A solar-operated mechanical surface mixer is proposed that would continuously turn the top layer of water over, creating an aerobic "cap" that would reduce odors from the sludge. The existing aeration system will remain in working order and can be used as a backup or to supplement the mechanical mixer. There may be some odors from the lower level (non-aerated) sludge for a brief time immediately after the existing aeration system begins operation. An emergency generator would also be provided with this alternative. Because this alternative could be constructed within the footprint of the existing treatment facility, the District should be able to meet the compliance schedule of the discharge permit.

- C-6 MEMBRANE BIO REACTOR (MBR) – This alternative would consist of an integrated activated sludge and membrane package treatment system (MBR). A benefit of MBR technology is that the bioreactor is operated at a considerably higher biomass concentration than conventional activated sludge plants, which allows for the construction of smaller tanks while still providing a high level of wastewater treatment. The MBR system would produce a high quality effluent and provide the required nitrogen and BOD removal, while the membranes would provide a physical barrier to *E. coli* bacteria.

The proposed MBR system includes three zones for wastewater treatment. The first zone would include an anoxic zone (to promote denitrification), an aerated second zone for BOD removal and nitrification (conversion of ammonia to nitrite/nitrate), and the third zone contains the membranes for filtration. The pore size of the proposed membranes is about 6 times smaller than *E. coli* bacteria and the membranes also filter out any particulate matter (TSS). Once water is drawn into the membranes, it is then discharged to the UV system for disinfection prior to disposal to the IP cells. The existing lined treatment cells (Cells 1 and 2) could be used for sludge storage and in an emergency, the effluent could be routed to these cells in the event that *E. coli* is detected in the effluent for temporary storage and the water re-treated once the treatment system is operational again. Undigested or unstabilized sludge would be placed in one of the existing lined treatment cells for additional treatment and at some future time, be removed by a contractor specializing in sludge removal. A solar-operated mechanical surface mixer is proposed

that would continuously turn the top layer of water over, creating an aerobic "cap" that would reduce odors from the sludge. The existing aeration system will remain in working order and can be used as a backup or to supplement the mechanical mixer. There may be some odors from the lower level (non-aerated) sludge for a brief time immediately after the existing aeration system begins operation.

A new building would be constructed to house two fine screens (2-mm) to filter the influent flow, a washer/compactor, a vortex grit chamber, the MBR equipment, and an ultraviolet (UV) disinfection system. The treatment building and tankage would be located in a portion of existing Cell 3. A filtration system would be installed to help remove any remaining solids from the effluent and an ultraviolet (UV) light system would be provided for disinfection. The filter would help remove some bacteria and viruses, which would optimize the UV disinfection. The ultraviolet (UV) system would be 100% redundant at peak hour flow. An emergency generator would also be provided with this alternative. A Class 1C certified operator would be required to operate the proposed system. The District should be able to meet the compliance schedule of the discharge permit because this alternative could be constructed within the footprint of the existing treatment facility.

**B. COST COMPARISON - PRESENT WORTH ANALYSIS**

The present worth analysis is a means of comparing alternatives in present day dollars and can be used to determine the most cost-effective alternative(s). An alternative with low initial capital cost may not be the most cost efficient project if high monthly operation and maintenance costs occur over the life of the alternative. Salvage values were determined to be inconsequential and therefore not presented. An interest rate of 5.0% over the 20-year planning period (design year 2010 to 2030) was used in the analysis. Table 1 provides a summary of the present worth analysis of the feasible alternatives considered.

**TABLE 1 - ECONOMIC EVALUATION OF TREATMENT SYSTEM ALTERNATIVES**

Alternative Number (From Above)	Alternative	Total Capital Cost (million)	Annual O&M Cost	O&M Present Worth (million)	Total Present Worth (million)
C-2	Send Wastewater to City of Belgrade	\$3.7	\$26,000	\$0.32	\$4.0
C-3	Land Application of Effluent	\$2.7	\$83,000	\$1.03	\$3.7
C-4	Lagoon Upgrades	\$3.0	\$89,000	\$1.11	\$4.0
C-5	Activated Sludge (oxidation ditch)	\$4.7	\$55,000	\$0.69	\$5.1
C-6	Membrane Bioreactor (MBR)	\$3.9	\$102,000	\$1.27	\$4.9

**C. BASIS OF SELECTION OF PREFERRED ALTERNATIVE**

Selection of the preferred alternative was based upon several criteria, both monetary and non-monetary. The ranking criteria considered are shown in Table 2. Each alternative was assigned a ranking score of 1 to 5 for each category, with 5 being the

most favorable and 1 being the least favorable. The ranking factors were then multiplied by the relative weight of importance assigned to each evaluation criteria. The weighted rank scores were then summed, resulting in a weighted rank total score, the greatest score indicating the highest ranking. As shown in the ranking criteria matrix, Alternative C-6 (MBR) ranked the highest, primarily due to schedule compliance, treatment reliability, and facility flexibility. Due to the distinct nature of MBR manufacturer designs, a competitive pre-selection process was undertaken.

The estimated administration, design and construction cost Alternative C-6 is approximately \$4.2 million. The District will fund the project using a \$4.135 million loan from the Water Pollution Control State Revolving Fund (WPCSRF) program. Of the loan amount, \$300,000 will be forgiven, with the remaining \$3.83 million having an interest rate of 3.75% for 20 years.

Comparison Criteria	Weighting Criteria	Alt C-2: Send WW to Belgrade		Alt C-3: Land Application of Effluent		Alt C-4: Lagoon Upgrades		Alt C-5: Activated Sludge (oxidation ditch)		Alt C-6: Membrane Bioreactor (MBR)	
		Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
Cost Effectiveness	5	4	20	5	25	4	20	2	10	3	15
Schedule Compliance	5	2	10	4	20	5	25	5	25	5	25
Treatment Reliability	4	4	16	4	16	4	16	5	20	5	20
Operational Ease	3	5	15	3	9	4	12	4	12	4	12
Facility Flexibility	3	3	9	3	9	3	9	4	12	5	15
Energy /Resource Use	2	5	10	4	8	3	6	3	6	3	6
<b>Weighted Total</b>		80		87		88		85		93	

The proposed project will be funded with a general obligation (GO) bond, therefore a yearly assessment to each property owner served by the wastewater treatment system within the River Rock Water & Sewer District for the GO bond will be incurred and will average about \$24.16 per month per property, based on a home with a taxable value of \$100,000. The proposed O&M costs will be about \$15.28 per month, for an increase of about \$39.44 per month per property.

The existing average monthly residential user rate is \$21.35. To this cost, \$39.44 (\$24.16 for debt service and \$15.28 for O&M) must be added, resulting in an equivalent monthly sewer rate of \$60.79 per property. The financial impact of this project on the system users is shown in Table 4. Based on the EPA affordability guidance, the proposed project will result in a monthly cost per household that is 1.61% of the monthly median household income, and therefore may impose a moderate economic hardship on household income for some residents.

Table 4 PROJECT AFFORDABILITY (GO BOND)	
Total equivalent monthly debt service and O&M cost <sup>1</sup>	\$60.79
Monthly median household income (mMHI) <sup>2</sup>	\$3,784.42
User rate as a percentage of mMHI	1.61 %

<sup>1</sup> Based on \$250.00 per year for average home cost (market value) of \$100,000

<sup>2</sup> Based on 2006-2010 census data 5-year estimate - (Belgrade)

#### IV. AFFECTED ENVIRONMENT

##### A. PLANNING AREA/MAPS

River Rock subdivision (Subdivision) is located about one mile west of the City of Belgrade, Montana (see Figure 3). Water and sewer services for the Subdivision are provided through the River Rock County Water and Sewer District.

The planning area encompasses the Subdivision and is equal to the service area (see Figure 3). The Subdivision is mostly built out and includes 1,135 taxable lots. Additional flow is expected from the twelve remaining undeveloped lots, therefore, unless the service area is expanded to include some surrounding properties the wastewater flow is not expected to increase significantly. The proposed project involves construction of a new membrane bioreactor (MBR) facility with UV disinfection to provide advanced wastewater treatment (Figure 4). The project will take approximately one year to construct, following system design and state approval. Construction is scheduled to begin in the summer of 2012.

##### B. FLOW PROJECTIONS

Based on actual measurements, the current average day flow to the wastewater treatment facility is approximately 157,000 gallons per day (gpd). The discharge permit allows a maximum discharge of 374,000 gpd. The original design flow was based on 100 gallon per day per capita (gpcd), but the actual flow is about 65 gpcd. Infiltration and inflow into the collection system is not an issue. The proposed treatment facility will be designed to treat an average of 200,000 gpd, which provides a safety factor in the design. As previously noted, the Subdivision is mostly built-out and minimal growth or flow increase is expected to occur, unless the service area is expanded.

##### C. NATURAL FEATURES

The River Rock Subdivision is located in the north central part of the Gallatin Valley, which is a broad, intermontane valley. The elevation of the Subdivision is approximately 4450 feet above sea level. Soils in the area are predominantly either a Beaverell cobbly clay loam near the surface and an extremely cobbly coarse sandy and gravelly cobbly loamy coarse sand soil at depth, which is a highly permeable, or a Beaverell-Beavwan complex soil which is also highly permeable soil, and consists of a very cobbly clay loam near the surface, an extremely cobbly coarse sandy and extremely cobbly loamy sand at deeper depths.

The depth to groundwater in the area is typically greater than twenty feet. The aquifer in the area is unconfined and generally has a depth of 50 feet or more, with a hydraulic gradient of 0.0079 ft/ft to the NE. Geotechnical subsurface investigations, completed on March 2<sup>nd</sup> and March 3<sup>rd</sup>, 2011, showed no groundwater to 49.4 feet.

Average annual precipitation is 13 to 15 inches and the average annual temperature is 42° F. The wettest months are typically May and June and the driest months are usually November through February. There are no year round streams within the planning area.

## V. ENVIRONMENTAL IMPACTS OF PROPOSED PROJECT

### A. DIRECT AND INDIRECT ENVIRONMENTAL IMPACTS

1. Land Use – There will be no impact to land use due to the proposed project. All treatment improvements will occur on land within the boundaries for the existing wastewater treatment facility.
2. Floodplains and Wetlands – No improvements will occur within the 100-year floodplain. The proposed project will not impact any wetlands. The Department of Natural Resources (floodplains) and Army Corps of Engineers (wetlands) have been notified of this project and asked to reply with any concerns. See *Section X Agencies Consulted* of this report for a summary of their comments.
3. Cultural Resources – No impacts to cultural resources are anticipated. All construction activity will occur on previously disturbed ground within the boundaries of the existing treatment facility. The State Historic Preservation Office (SHPO) reviewed the proposed project. See *Section X Agencies Consulted* of this report for a summary of their comments.
4. Fish and Wildlife – Animal life will not be significantly affected by the proposed project. All improvements will occur within the boundaries of the existing treatment plant and therefore the project will not affect any critical wildlife habitats, nor will any known endangered species be affected.

The Montana Department of Fish, Wildlife, and Parks and U.S. Fish and Wildlife Services have been notified of this project and asked to reply with any concerns. See *Section X Agencies Consulted* of this report for a summary of their comments.

5. Water Quality – The purpose of the project is to reduce the concentration of nitrate (as Nitrogen) and *E. coli* bacteria discharged by the wastewater treatment facility to the groundwater and the proposed facility will produce a higher quality effluent than the current facility. Therefore, this project will have a positive effect on the groundwater quality down-gradient of the Subdivision.

The wastewater treatment facility is approved to discharge 91.1 pounds per day (based on a 30-day average) of total inorganic nitrogen and a maximum flow rate of 374,000 gallons per day. The treatment facility must also obtain an 85% (arithmetic mean of 30 days) removal rate of the carbonaceous biological oxygen demand (CBOD) and maintain the pH between 6.0 and 9.0.

The classification of the receiving groundwater is Class I. As defined in the Administrative Rules of Montana (ARM 17.30.1006(1)(a)), a Class 1 groundwater is suitable for the following beneficial uses with little or no treatment: public and private water supplies, culinary and food processing purposes, irrigation, drinking water for livestock and wildlife and for industrial and commercial purposes. Secondary and human health standards apply to concentrations of substances in Class I groundwaters. Class I groundwaters are considered high quality waters and are subject to Montana's Nondegradation Policy. However, the District's wastewater discharge was approved prior to April 29, 1993 and because this proposed project will not increase (flow) or is not a new source, nondegradation limits do not apply.

Although nondegradation limits do not apply, numeric water quality standards found in DEQ-7 do apply and they include: nitrate (< 10 mg/L) and *E-coli* bacteria (< 1 cfu per 100 ml). Total inorganic nitrogen is comprised of nitrate, nitrite, and ammonia and therefore because the proposed project is expected to produce less than 10 mg/L of total nitrogen, the facility should be in compliance with the nitrate limit. The membrane filtration and ultraviolet light disinfection systems should ensure compliance with the *E. coli* limit.

6. Air Quality - Short-term negative impacts on air quality are expected to occur during construction from heavy equipment in the form of dust and exhaust fumes. Proper construction practices will minimize this problem. Project specifications will require dust control. Due to the residential development adjacent to the treatment plant, coordination with neighboring properties during construction will be important.
7. Public Health - Public health will not be negatively affected by the proposed project. The proposed treatment facility improvements will reduce nutrient loading and bacteria to the groundwater, which is used downstream of the District. Improved sewage treatment will reduce the potential to pollute groundwater.
8. Energy - An increase in energy consumption will occur after the new treatment plant is constructed due to additional equipment. Energy consumption will be minimized as much as possible through the use of energy efficient equipment (pumps, blowers, lighting, etc). The consumption of energy resources directly associated with construction of the recommended improvements is unavoidable but will be a short-term commitment.

9. Noise - Short-term impacts from excessive noise levels may occur during the construction activities. Due to the residential development adjacent to the treatment plant, coordination with neighboring properties during construction will be important. The construction period will be limited to normal daytime hours to avoid early morning or late evening construction disturbances. Noisy new equipment will be housed within a building, and therefore no significant long-term impacts from noise will occur.
10. Sludge Disposal – The District does not expect to remove any sludge (biosolids) from the site as part of this project. However, sludge will be moved from Cell 1 and Cell 3 to Cell 2, where it will continue to be treated. A surface mixer will be installed in Cell 2 to maintain an aerated “cap” over the sludge, which would become anaerobic (and odorous) without mixing. Approximately 4.5 million gallons of storage is available for storage, allowing storage for 15 to 20 years before the District would be required to remove sludge. If the District does remove sludge, an EPA 503 permit will need to be prepared and submitted to the EPA and DEQ for review and approval. Biosolids applied to land must meet all applicable requirements of 40 CFR Part 503 of the Code of Federal Regulations. The Part 503 regulations contain specific numerical limits and other requirements for heavy metals, pathogens, and vector attraction.
11. Environmental Justice – Environmental Justice Executive Order 12898: The proposed project will not result in disproportionately high or adverse human health or environmental effects on minority or low income populations. The economic impact will ultimately affect all of the users of the system proportionately to the taxable value of their individual property throughout the subdivision. No disproportionate effects among any portion of the community would be expected.
12. Growth – The River Rock Subdivision is mostly built-out and therefore only twelve new homes can be constructed in the current service area. Minimal additional growth is expected in the service area. Improvements to the WWTP will be a positive feature for the community.
13. Cumulative Effects – Upgrading the treatment facility is not expected to result in any secondary and cumulative impacts related to growth in the Subdivision. Although growth impacts could include: increased air emissions from additional traffic, increased water consumption, increased discharge of treated effluent into the groundwater, and possible loss of agricultural and rural land uses, none of these is expected to be significant because only twelve homes can be constructed on currently undeveloped lots.
14. Farmland Protection – No farmland will be impacted. With the exception of work in the adjacent street to construct a driveway approach and place a water service to the new building, all construction will be within the boundaries of the existing treatment facility.

15. Wild and Scenic River – No wild and scenic rivers will be impacted.

B. UNAVOIDABLE ADVERSE IMPACTS

Short-term construction related impacts (i.e., noise, dust, traffic disruption, etc.) will occur, but should be minimized through proper construction management. Energy consumption during construction cannot be avoided.

VI. PUBLIC PARTICIPATION

Public participation for this project included a public meeting on July 21, 2011. At the public meeting, the need for the project, the recommended alternative and expected construction costs were presented by the District engineer and treatment system operator. The expected methods for financing for the project and proposed sewer rates were discussed as well. Three questions were asked by the public during the meeting. None of the questions directly opposed the project or expected costs.

VII. AGENCY ACTION, APPLICABLE REGULATIONS AND PERMITTING AUTHORITIES

No additional permits will be required from the State Revolving Fund (SRF) section of the DEQ for this project after the review of the submitted plans and specifications. However, coverage under the storm water general discharge permit and groundwater dewatering discharge permit, if necessary, are required from the DEQ Water Protection Bureau prior to the beginning of construction.

VIII. RECOMMENDATION FOR FURTHER ENVIRONMENTAL ANALYSIS

EIS                       More Detailed EA                       No Further Analysis

Rationale for Recommendation: Through this EA, the DEQ has verified that none of the adverse impacts of the proposed River Rock advanced wastewater treatment project are significant. Therefore, an environmental impact statement is not required. The environmental review was conducted in accordance with the Administrative Rules of Montana (ARM) 17.4.607, 17.4.608, 17.4.609, and 17.4.610. The EA is the appropriate level of analysis because none of the adverse effects of the impacts are significant.

IX. REFERENCE DOCUMENTS

The following documents have been utilized in the environmental review of this project and are considered to be part of the project file:

1. River Rock County Water and Sewer District Alternative Analysis for Wastewater Treatment Facility Improvements (Alternative Analysis Report), May 2010, prepared by Morrison Maierle, Inc.
2. Uniform Application Form for Montana Public Facility Projects for the River Rock Water and Sewer District, March 2, 2011, with update August 4, 2011, prepared by the River Rock County Water and Sewer District.

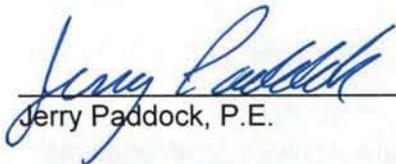
3. River Rock MBR Equipment Pre-Selection Documentation, January 7, 2011 prepared by Morrison-Maierle, Inc.
4. Authorization to Discharge Under the Montana Ground Water Pollution Control System, Department of Environmental Quality Permitting and Compliance Division, Montana Department of Environmental Quality Permit No. MTX000147, April 1, 2010.

X. AGENCIES CONSULTED

The following agencies have been contacted in regard to the proposed construction of this project:

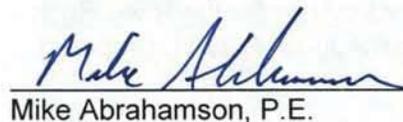
1. The U.S. Fish and Wildlife Service reviewed the proposed project and had no concerns with the proposed project. The Service is supportive of any viable wastewater treatment option that is likely to result in the improved quality of waters as they would be beneficial to fish, wildlife, and habitat resources. They recommend the District select the alternative that is most cost effective and efficiently produces the greatest reduction in ground and surface water pollutants.
2. The Montana Department of Natural Resources and Conservation (DNRC) was contacted regarding the proposed project. To date, no comments have been received.
3. The Montana Historical Society's State Historic Preservation Office (SHPO) reviewed the proposed project. According to their records, there have been no previously recorded sites within the designated search locales and a cultural resource inventory is unwarranted at this time. However, should structures need to be altered or cultural materials be inadvertently discovered during the project, SHPO must be contacted and the site investigated.
4. The U.S. Department of the Army Corps of Engineers (USCOE) reviewed the proposed project and because no fill material will be placed either temporarily or permanently in waters of the U.S., no USCOE permit will be required.
5. The Montana Department of Fish, Wildlife and Parks indicated that they did not have any comments regarding the proposed improvements in the River Rock Wastewater Alternative Analysis Report.

EA Prepared by:

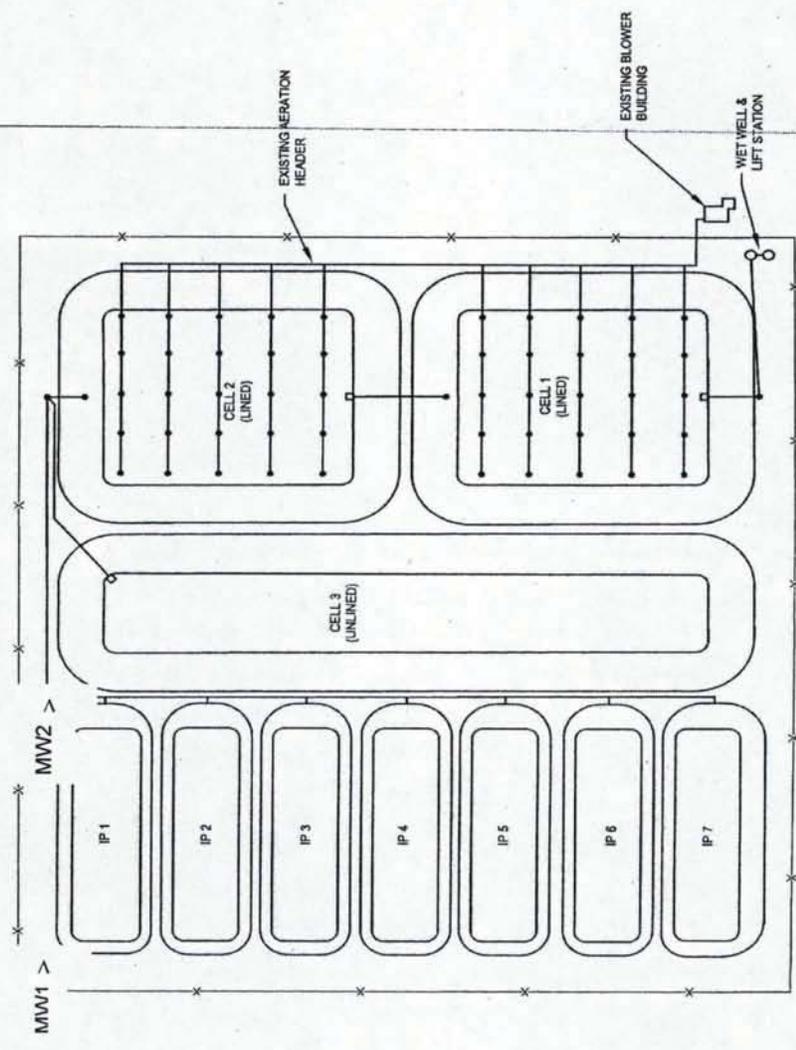
  
 \_\_\_\_\_  
 Jerry Paddock, P.E.

3/15/12  
 \_\_\_\_\_  
 Date

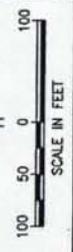
EA Reviewed by:

  
 \_\_\_\_\_  
 Mike Abrahamson, P.E.

3/15/12  
 \_\_\_\_\_  
 Date



Monitor Wells Locations  
Are Approximate



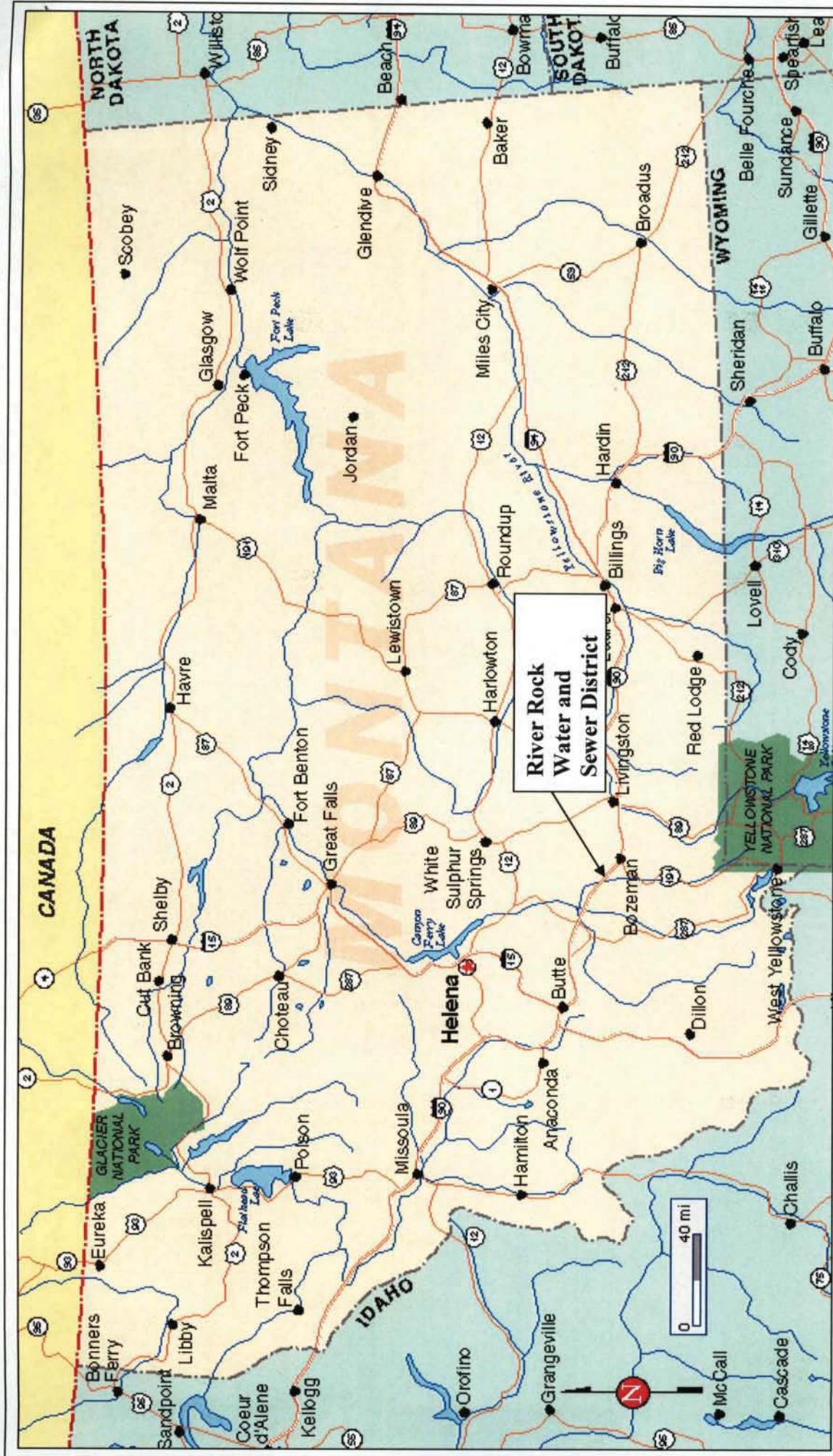
DRAWN BY: JDE	CHECKED BY: JDE
APPROVED BY: JDE	DATE: 08/02/02

RIVER ROCK  
RIVER ROCK WATER AND SEWER DISTRICT

MONTANA

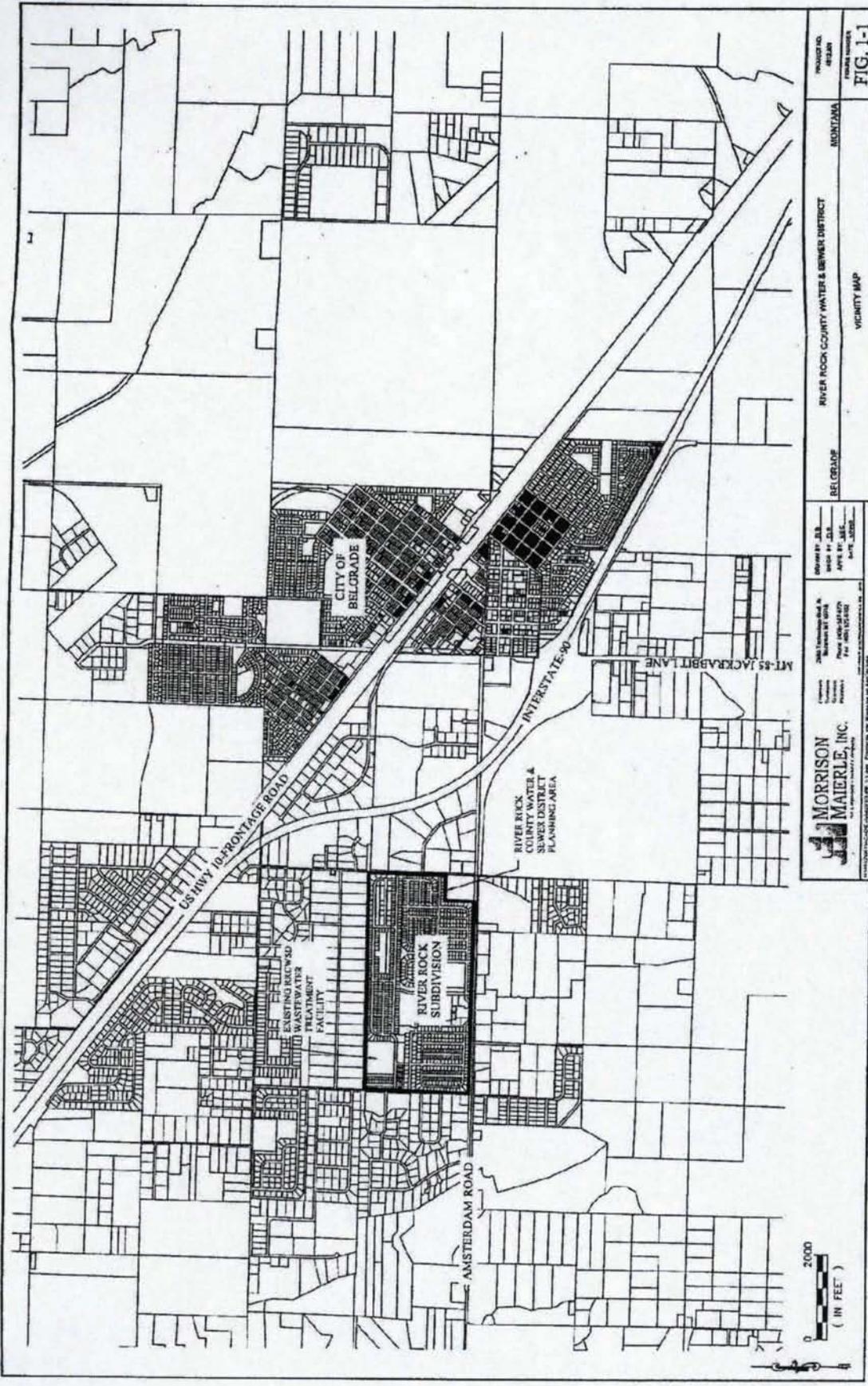
PROJECT NO.  
4817101

Figure 1 - Existing Treatment Facility



Montana Department of  
**ENVIRONMENTAL QUALITY**

**Figure 2. Site Location Map – River Rock Subdivision**

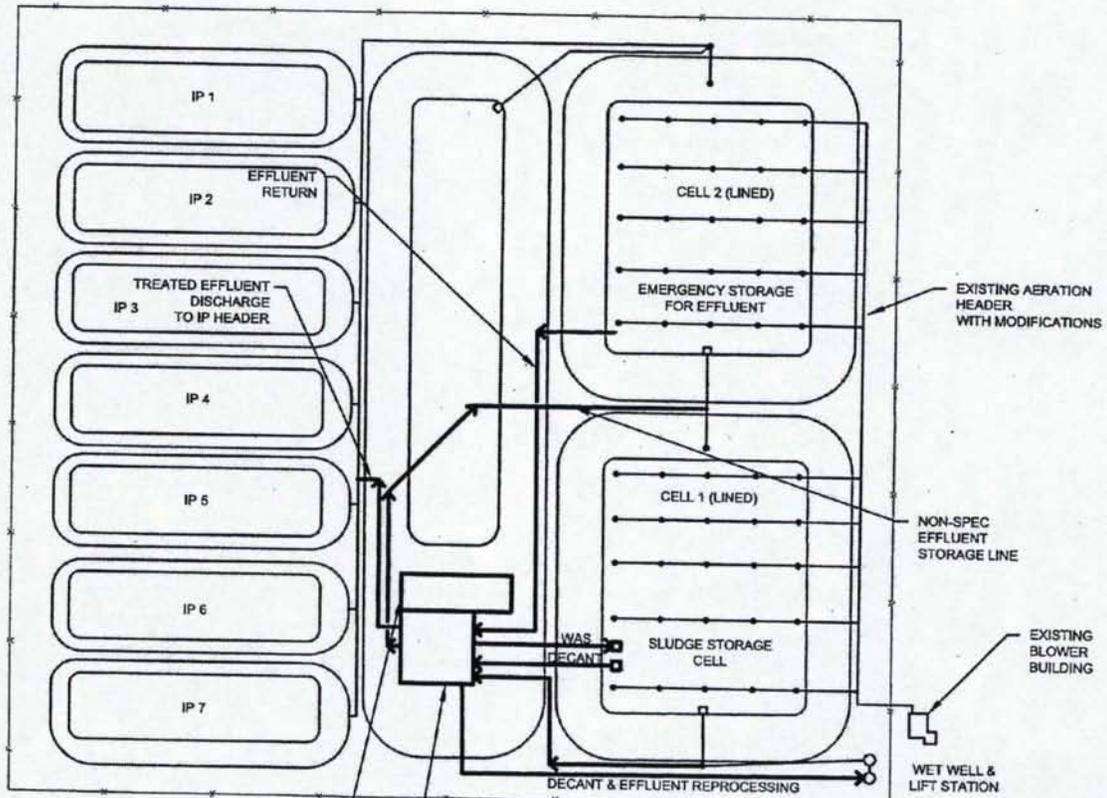



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 CHECKED BY: J.E.L.  
 DATE: APR. 21, 2010  
 SCALE: AS SHOWN

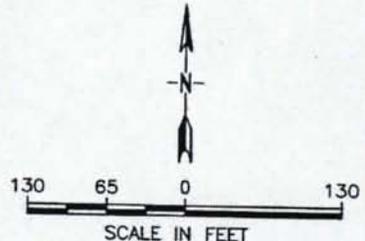
PROJECT NO.: 08-001  
 SHEET NO.: 101  
 PROJECT NAME: RIVER ROCK COUNTY WATER & SEWER DISTRICT  
 LOCATION: BELGRADE, MONTANA  
 DRAWING TITLE: VICINITY MAP  
 FIG. 1-1

Figure 3 – Vicinity Map and River Rock Planning Area



PRE-AERATION ANOXIC TRAIN  
FOOTPRINT ADJACENT TO  
HEADWORKS BUT NOT INSIDE.  
~88'x45'

NEW 80'x60' HEADWORKS/TREATMENT  
BUILDING. INCLUDES SCREENS, WASHER,  
COMPACTOR, MBR EQUIPMENT AND UV  
SYSTEM AND BLOWERS



 <b>MORRISON MAIERLE, INC.</b> An Employee-Owned Company	Engineers	1 Engineering Place	DRAWN BY: <u>JPS</u>
	Surveyors	Helena MT 59602	CHKD. BY: <u>CPH</u>
	Schedulers	Phone: (406) 442-3050	APPR. BY: <u>CPH</u>
	Planners	Fax: (406) 442-7862	DATE: <u>04/20/10</u>

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R:\4812\000\ACAD\Exhibits\FIGURE 4-8.dwg Plotted by rika leshley on Apr/29/2010

RIVER ROCK WATER AND SEWER DISTRICT		PROJECT NO.
RIVER ROCK	MONTANA	4812.001
ALTERNATIVE C6 SITE PLAN		FIGURE NUMBER
		<b>FIG. 4-8</b>

Figure 4 – Proposed Treatment Facility

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MARY SEXTON  
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▲ CORE LIST

▼ NONE  
OPTIONAL LIST

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GALLATIN AIRPORT AUTHORITY  
GALLATIN FIELD AIRPORT  
BELGRADE MT 59714

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