Montana Department of
ENVIRONMENTAL QUALITY

Steve Bullock, Governor
Tracy Stone-Manning, Director

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

March 21, 2014

Steven B. Hamilton, Mayor
206 Main Street
Three Forks, MT 59752

RE: DEQ Project Number: C302217 – Three Forks Wastewater Treatment Improvements Project - EA & FONSI

Dear Mayor Hamilton:

Enclosed is a copy of the Finding of No Significant Impact (FONSI) and Environmental Assessment (EA) for the City of Three Forks, Wastewater Treatment Facility Improvements project. Please print just the FONSI (signed by Todd Teegarden) in one publication of your local paper under legal advertising and return the proof of advertising. You do not have to publish the EA.

You will need to maintain copies of the planning documents and draft design along with this EA and FONSI for public review at your offices should anyone from the public request access to that information. Please keep any written responses you receive for delivery to this office upon completion of the 30-day publication period. Any written responses received will be further considered by DEQ to determine if those comments constitute a "significant" environmental impact related to the proposed project.

We recommend that you advertise this as soon as possible to allow for a 30-day comment period. We have distributed these documents to the enclosed list of agencies and it will also be published on the DEQ website in its entirety. If you have any questions, please do not hesitate to contact me at (406) 444-7343.

Sincerely,

Terry Campbell

Terry Campbell, P.E.
Environmental Engineer
Technical & Financial Assistance Bureau

Encl. EA, FONSI, Three Forks WWTF Improvements Project

cc: Paul Skubina, DEQ Water Protection Bureau (via e-mail)
Anna Miller, DNRC, CARRD (via e-mail)
Fred Phillips, PE, GWE (email)
Darcy Perrenoud, Three Forks (email)
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FONSI&EA_DistributionList.doc

Montana Department of
ENVIRONMENTAL QUALITY

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

March 21, 2014

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	City of Three Forks Wastewater Treatment Facility Upgrade
Location	Three Forks, Montana
Project Number	WPCSRF Project # C302217
	Total Cost - $4,530,000

The City of Three Forks, through its February 2006 Preliminary Engineering Report (PER) and May 2012 PER Amendment prepared by Great West Engineering. (Engineer), has identified the need to make significant changes to their wastewater treatment system. The current WWTF was last modified in 1982 to serve the city and was designed to operate as a facultative lagoon with both groundwater and surface water disposal. Wastewater is collected via gravity sewers and then pumped from a lift station to a pond system, prior to groundwater discharge via two infiltration/percolation (IP) cells with a small portion recollected in a tile collector and discharged to the Madison River near the Interstate 90 overpass. The system also includes two storage ponds originally lined with clay soils. Those ponds leak in excess of allowable standards. Three Forks is located near the confluence of the Jefferson, Madison and Gallatin Rivers and shallow groundwater within the collection system results in significant contributions of clear water to the wastewater collection system. A previous project to eliminate this inflow was only marginally successful.

The purpose of the proposed treatment facility upgrade is to provide a new wastewater treatment system that will meet the treatment requirements contained within the city discharge permit. Currently the city has entered into an Administrative Order on Consent with the Montana Department of Environmental Quality (DEQ) to correct deficiencies with the existing system that have resulted in more than 35 documented discharge violations. The city proposes construction of a new wastewater treatment facility that would ultimately provide enhanced treatment to remove BOD, TSS and ammonia. The proposed treatment facility would consist of three new (and smaller) lagoon cells to be constructed within the footprint of the existing facility. The first cell will be a complete-mix, aerated lagoon and the two remaining cells will be partial-mix aerated lagoons. A cover is proposed over parts of the cells to enhance treatment and to eliminate algae. A UV disinfection system is proposed to allow compliance with *E.coli* limits in the permit. The new treatment facility will allow for connection of the Ridgeview Subdivision via a new collection system and lift station.

Federal and State grant/loan programs will help 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 environmental impacts in more detail, is available for public scrutiny on the DEQ web site (**http://www.deq.mt.gov/ea.mcpx**) and at the following locations:

Terry Campbell, P.E.
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1520 East Sixth Avenue
P.O. Box 200901
Helena, MT 59620-09011
tcampbell@mt.gov

Steven B. Hamilton, Mayor
City of Three Forks
206 Main Street
Three Forks, MT 59752

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 the date of this notice of the Finding of No Significant Impact.

Sincerely,

Todd Teegarden

Todd Teegarden, Bureau Chief
Technical and Financial Assistance Bureau

CITY OF THREE FORKS
WASTEWATER TREATMENT FACILITY UPGRADE

ENVIRONMENTAL ASSESSMENT

I. PROJECT SUMMARY INFORMATION

A. PROJECT IDENTIFICATION

Name of Project:	Wastewater System Improvements
Applicant:	City of Three Forks
Address:	206 Main Street Three Forks, MT 59752
DEQ Project Number:	C302217

B. CONTACT PERSON

Name:	Steven B. Hamilton
Address:	206 Main Street Three Forks, MT 59752
Telephone:	(406) 285-3762

C. ABSTRACT

The City of Three Forks (in a February 2006 and Updated May 2012, Preliminary Engineering Report, prepared by Great West Engineering) has identified the need to upgrade the wastewater treatment facility (WWTF). The existing wastewater facility consists of a central collection system, a single main lift station, a 2-cell facultative lagoon system that discharges to two infiltration/percolation (I/P) cells during summer months or to a storage pond during the winter months. Discharge from the facility is primarily to groundwater, however an underdrain system located below the I/P cells collects some of the wastewater and discharges directly to the Madison River near the I-90 overpass under a Montana Pollution Discharge Elimination System (MPDES) permit MT0020401. Water diverted to the winter storage pond discharges primarily through seepage and evaporation. The storage pond was constructed as a clay-lined pond during an upgrade in 1982.

The improvements are necessary to allow the city to meet its discharge permit limits and sustain growth within the community. The existing facility has had difficulty meeting permit limits for total suspended solids (TSS), biological oxygen demand (BOD) and *E.coli* bacteria. The Madison River is listed on the 2012 DEQ 303(d) stream impairment list. The list of impairments includes metals and suspended solids which have been contributed to the stream from historical mining, dam construction and agricultural sources.

The current discharge permit was issued in 2009 and was due to be renewed in 2014. Because of permit violations that occurred between 2007 through 2012, the DEQ and Three Forks have entered into an Administrative Order on Consent (AOC) to address the violations. The AOC will remain in place until corrective measures are completed to ensure future compliance. The AOC requires upgrades to the existing facility be made by October 1, 2014 to allow the facility to comply with permit conditions. Once these improvements are complete a new MPDES permit will be developed for the facility. The new permit will contain more restrictive limits for BOD and TSS and new limits for ammonia. The Madison River is a prime trout stream, therefor acutely sensitive to impacts from discharge of ammonia. Because of this situation, ammonia toxicity limits will be imposed to protect fish and aquatic life and metals limits may also be imposed due to stream impairment for copper, lead, sedimentation and

temperature. *E.coli* limits are required for any treatment configuration discharging to the Madison or shallow groundwater table. The existing facility cannot achieve the level of treatment necessary to comply.

The discharge permit limits are driving upgrades to the existing lagoon facility to enhance secondary treatment, ensure removal of ammonia and provide for disinfection of effluent. The WWTF upgrade project will help the city improve treatment with respect to meeting secondary standards, ammonia and *E.coli* permit limits and eliminate groundwater impacts associated with the discharge.

Major WWTF improvements include:

- New headworks building with screening facility.
- Construction of a new complete mix/partial mix aerated lagoon system.
- New blower building complete with electrical controls and air system.
- Installation of a new effluent discharge pumping station.
- Installation of ultra violet (UV) disinfection equipment to reduce pathogen risks associated with the discharge.
- Installation of new standby power generator.
- Rehabilitation of the existing lagoon site and sludge disposal in accordance with State of Montana Solid Waste rules or EPA 503 regulations, and
- Stub outs for further tertiary treatment equipment for removal of nutrients and metals if needed to comply with a future discharge permit.

Federal and State grant/loan programs will help fund the project. The proposed improvements are estimated to cost approximately $4,500,000. It is anticipated that the project will be funded through a low interest loan (3.0 %) obtained from the DEQ Water Pollution Control State Revolving Fund (WPCSRF) loan program, and grants of $100,000 from the Department of Natural Resources and Conservation (DNRC) and $750,000 from the Treasure State Endowment Program (TSEP).

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 biosolids 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 current Three Forks WWTF was constructed in 1982. Cattails and other plants have proliferated in the large storage pond and the integrity of the bentonite liner is compromised due to root penetration and wetting/drying cycles. The percolation ponds recharge the aquifer and nearby recreational ponds used for swimming and fishing, posing a public health threat. Approximately 80 percent of the city's effluent via the percolation cells is discharged to the shallow groundwater table.

About half of the collection system dates back to 1916 and is clay tile pipe. Fairly extensive collection system upgrades occurred in 2008 when cured-in-place lining of approximately 21,000 lineal feet of clay tile sewer mains was completed. However many of the service lines into homes and businesses are still in need of upgrade and therefor, wet weather flow rates to the WWTF are still high and problematic with respect to providing adequate treatment.

The existing WWTF is not capable of consistently meeting current discharge permit limits. The city has had 47 documented effluent limit exceedances for the period between July 2007 & January 2012. Primarily the facility cannot meet biological oxygen demand (BOD), total suspended solids (TSS) and *E.coli* limits. On September 13, 2012, the city entered into an Administrative Order on Consent (AOC) with the Montana Department of Environmental Quality (DEQ) to address these violations and make upgrades to the wastewater treatment facility. The AOC stipulates that the wastewater treatment facility must meet permit limits by October 1, 2014. An extension to this deadline may be sought by the city to allow more time for compliance.

In order to address permit limits and provide capacity for flows and loads through the planning period, the WWTF will need to be upgraded and additional treatment processes added. The discharge permit requires that a more advanced treatment process capable of eliminating ammonia toxicity and providing for disinfection of final effluent be implemented. Metals and arsenic may also be regulated in a future permit cycle. With that in mind, the WWTF has been designed to accommodate tertiary treatment in a future phase if the need should arise.

As a means of making the project more affordable for residents and providing central sewer service to Ridgeview Subdivision, the proposed project will include a collection main and new lift station to the subdivision.

The Three Forks treatment facility is planned to be constructed to meet current permit conditions with the ability to upgrade via tertiary treatment filters should the discharge permit require nutrient or specific metals removal at a future time.

III. ALTERNATIVES INCLUDING THE PROPOSED ACTION

A. TREATMENT TECHNOLOGIES CONSIDERED

Within the 2006 PER and 2012 Amended PER, there were twelve treatment alternatives, and the "no action" alternative considered. The alternatives cover a range from non-discharging facilities to secondary treatment facilities, to ammonia removal facilities to advanced biological nutrient removal facilities. Some of the alternatives can function as just ammonia removal facilities, or be enhanced to achieve biological nutrient removal. A couple of other alternatives were discussed very briefly within the planning documents, but they were determined not to merit further investigation, so are not discussed in any detail here. Those included septic tank & drainfield; snow-making, and high rate land application disposal. There was also an evaluation of use of tertiary polishing technology within a future phase of construction if permit conditions change. The treatment alternatives evaluated included the following:

A-1. NO ACTION – The existing 2-cell lagoon treatment facility is at the end of its useful design life, is significantly contributing nutrients and *E.coli* bacteria to the shallow groundwater table and adjacent recreational ponds and cannot meet current discharge permit limits. Therefore, this alternative was not considered to be a viable alternative.

NON-DISCHARGING ALTERNATIVES

A-2. TOTAL RETENTION LAGOONS – Although a viable alternative for some small communities, total retention lagoons would require approximately 200 acres of area to fully contain and evaporate all effluent from the City of Three Forks. This alternative was determined to not be economical or practical. This alternative was not further evaluated.

A-3. FACULTATIVE LAGOON WITH SLOW RATE LAND APPLICATION – This type of system requires construction of a large storage pond for non-irrigation season storage or winter season discharge to the river or groundwater table. Effluent is used via a center pivot system for crop irrigation during the growing season. This alternative would result in a continued use of the existing two large facultative ponds and construction of a new 13.7 acre winter storage pond and approximately 190 acres of crop acreage to agronomically use the effluent. The water and nutrients are fully utilized by the crop using this practice. There is a great deal of irrigated land within the vicinity of the existing lagoons. This alternative was further considered within the planning document.

DISCHARGING SECONDARY TREATMENT TECHNOLOGIES

A-4. NATURALLY AERATED FACULTATIVE LAGOONS WITH DISCHARGE TO RIVER – This alternative uses large conventional 3-cell shallow lagoons with long storage times to remove solids using slow growing microbiology to break down and settle out the solids. When considered within the 2006 PER, the total suspended solids (TSS) discharge allowance was 100 mg/L for this type of system. The new permit requires Three Forks to treat to 30 mg/L and 85% removal of TSS. This more stringent standard for TSS dramatically changes the feasibility of using this alternative. The size of ponds, cost of liner system, and earthwork needed, also lead to a less than feasible rating. This alternative was not further evaluated for these reasons.

A-5. MECHANICAL AERATED LAGOON WITH DISCHARGE TO THE RIVER – This type of system requires construction of at least a 3-cell system, where the first pond is mechanically aerated and mixed to enhance microbiological treatment. These are generally deeper ponds that require less footprint than those described in alternative 4, but have significantly higher operations and maintenance requirements. With this type of a system, it is possible to convert most of the ammonia to nitrate/nitrite, which is a consideration with respect to any continued river discharge. This alternative also requires effluent clarifiers to enhance settling to ensure effluent could meet BOD and TSS removal criteria in the future. This alternative could provide an appropriate solution for many years and could be enhanced with other tertiary technology in the future should the discharge permit require enhancement at a future time. This alternative was further considered within the planning document.

A-6. AERATED LAGOONS WITH WETLAND POLISHING – This alternative would consist of a 3-cell partial mix aerated lagoon system to provide secondary treatment with a final constructed wetland cell to further enhance treatment using natural vegetation. The existing facultative lagoon cells could be converted into wetland cells for this purpose. These cells need to be re-lined for this use. There is a significant cost in re-lining such large ponds. Constructed wetland cells used in Montana for effluent polishing have actually resulted in inconsistent BOD and TSS discharges that make compliance with a permit difficult. For these reasons this alternative was not further considered.

DISCHARGING AMMONIA REMOVAL FACILITIES

A-7. LAGOON MOVING BED BIOREACTOR (MBBR) – MBBR is a fixed film process, where a biofilm is allowed to grow on suspended plastic media within an aerated primary lagoon. The plastic media come in a variety of geometric shapes designed to maximize the available surface area for film growth. Effluent screens keep the media from washing out of the lagoon. This alternative also requires effluent clarifiers to enhance settling to ensure effluent could meet BOD and TSS removal criteria in the future. This technology has been shown to provide good ammonia removal, but does not accomplish full nutrient removal unless paired with other processes to accomplish phosphorus removal and denitrification steps. This alternative was further evaluated with the idea of phasing nutrient removal into a future project phase if necessary.

A-8. BIOLAC® (PROPRIETARY) ACTIVATED SLUDGE PROCESS – The Biolac® system is an activated sludge process using extended retention of biological solids to create a stable, easily operated system. This process was developed for lagoon facilities and can be modified to perform some nutrient removal, but has primarily been used to remove ammonia. Aeration to the small primary cell is delivered by a floating air delivery and suspended fine bubble diffuser system. Adequate air is constantly delivered to maintain biology and prevent icing conditions that can damage some mechanical equipment. No recycle flow is necessary because of the long solids retention times in the secondary cells, thus saving pumping costs and maintenance. This alternative was considered along with other ammonia removal facilities, but was not selected as one of the two to be further evaluated because it is very similar to alternative 11 below, yet the complete mix / partial mix alternative was seen as more flexible with respect to further enhancement for nutrient removal.

A-9. FIXED FILM TREATMENT PROCESS – A fixed film process, much like the MBBR concept consists of biofilm growth surfaces in contact with the wastewater. The film is created by and supports microorganisms that oxidize and treat the wastewater. Fixed films in the conventional fashion are a stationary surface or rotating wheel. The raw wastewater is trickled onto the surface or the surface is submerged and then rotated into the air so oxidation can occur. This process can provide oxidation of ammonia and solids and combined with clarification, can provide good BOD and suspended solids removal. These processes, while effective, suffer in smaller applications from the level of operational complexity and capital cost requirements. They are not further considered within the PER.

A-10. COMPLETE MIX / PARTIAL MIX SETTLING LAGOONS – This alternative is a lagoon process that includes prescreening, a complete mix lagoon followed by two partial mix/settling lagoons. A cell cover is used to control temperature and algae growth. Influent after screening is aggressively mixed and aerated within the first small lagoon cell for rapid oxidation / BOD removal. The settling ponds use a tapered mix/aeration process to stabilize and settle out solids. Sludge accumulates within the last two cells and must be removed periodically (6 – 8 year estimates). This technology was evaluated along with nitrogen filters as a future phase if the discharge permit requires nitrogen removal at a future point. This alternative will address current BOD and TSS limits contained within the existing permit and allow for expected system growth and connection of the Ridgeview Subdivision. This alternative was further evaluated with the idea of phasing nutrient removal into a future project phase if necessary.

DISCHARGING ADVANCED TREATMENT

A-11. ACTIVATED SLUDGE PLANT WITH DISCHARGE TO THE RIVER – Activated sludge treatment is a mechanical process where significant amounts of air and mixing energy are used to enhance microbial growth within a basin. This oxidation process greatly increases microbial density for treating typical municipal wastewater. Some of the settled biomass is constantly pumped back to the head of the plant to sustain the microbe population. The processing time is greatly reduced from many months for lagoon systems to several hours for typical activated sludge plants. There are a number of

design variations to this process. Some of those design variations are considered separately within the PER. Activated sludge facilities are combined with some form of clarification where the oxidized and stabilized solids are allowed to settle. The settled solids are then drawn off and delivered in concentrated liquid form to a solids handling process. The clear liquid portion from the treatment basin is decanted and normally disinfected for discharge. Types of activated sludge processes that are typical for communities the size of Three Forks include Sequencing Batch Reactors (SBR), oxidation ditches and Membrane Bioreactors (MBR). MBR facilities usually result in higher capital and O&M costs, so were not further evaluated within the PER. SBR and oxidation ditch systems were determined to be the most suitable activated sludge processes for Three Forks to be further considered.

A. OXIDATION DITCH MECHANICAL PLANT WITH DISCHARGE – As mentioned in alternative 7 above, an oxidation ditch process is a form of the activated sludge methodology with the potential for biological nutrient removal. An oxidation ditch is an oval shaped channel/basin, where wastewater is subjected to a circular path and exposed to oxic and anoxic zones to enhance nitrogen removal. As the wastewater initially enters the oxidation ditch, it is aerated via a paddle wheel or other aeration technology, then moved through a series of anoxic and aerobic zones depending on the design layout. Sludge wasting and recycling occurs at the bottom of the basin, while a large portion of the basin is recycled before discharge. Cycling through these zones allows for conversion of ammonia to nitrite and nitrate. Within the anoxic zones a significant amount of denitrification can occur. Final effluent is sent to a clarifier for settling and polished effluent can be discharged. The PER considered this alternative and SBR equivalent with respect to effluent performance, but due to cost and operational intensity, felt the SBR approach was better suited to Three Forks' needs. This alternative was not further evaluated within the planning document.

B. SEQUENCING BATCH REACTOR (SBR) WITH DISCHARGE – As discussed in 7 (above), a sequencing batch reactor is an activated sludge basin with significant automation to perform mixing/aeration (react), settling and decant all from the same basin. Because they can cycle air and mixing independently, they can be operated as a BNR facility. They are normally a package plant where the tankage needed is constructed on-site and the equipment is from a proprietary vendor. Automation is significant and for a mechanical plant, operational intensity is less than for some other BNR processes. They require a significantly smaller footprint because all operations including clarification and decant are performed within a single basin. This alternative was further evaluated within the planning document.

TERTIARY TREATMENT (FUTURE PHASE)

A-12. EFFLUENT FILTRATION (DENITE FILTERS AFTER BNR) – Denitrification filters are a fairly new polishing technology where effluent is placed in an anoxic reactor with a carbon source such as methanol. The flow is generally from top down through a biofilm tubing or media structure with an underdrain system that takes flow out to further treatment like disinfection, or directly to discharge. The process uses an anaerobic/anoxic bacteria environment to convert nitrite & nitrate to nitrogen gas. The gas bubbles to the surface and is vented to the atmosphere. These tertiary filter devices are mentioned within the PER as a means of complying with a future discharge permit if nutrient limits are included with discharge to the Madison River. This technology was not further considered within the planning document other than to substantiate a method of further treatment if required in the future.

B. DISINFECTION ALTERNATIVES

Three alternative disinfection technologies and the No Action alternative were discussed in the PER to ensure the new WRRF can meet *E.coli* limits within its discharge permit. The disinfection alternatives considered included the following:

D-1. NO ACTION – The facility cannot meet discharge permit limits with respect to pathogen (*E.coli*) control with respect to groundwater or surface water permits. Therefore, this alternative was not considered to be a viable alternative.

D-2. LIQUID CHLORINE (SODIUM HYPOCHLORITE) WITH DECHLORINATION – Would utilize a liquid chlorine feed system, but would also result in having to use a chlorine neutralization technology prior to discharge. This alternative is attractive from a cost standpoint, but presents a risk to the operations staff and the environment. For safety reasons, this technology was not further considered within the planning document.

D-3. OPEN CHANNEL ULTRAVIOLET LIGHT (UV) DISINFECTION – Installation of Open Channel UV disinfection technology would utilize a channel structure with banks of UV lamps in-stream to render pathogens non-virulent. UV systems are generally high maintenance systems that require frequent cleaning. They also utilize a significant power supply, so have fairly high operating costs associated with their use. However, they are much safer than chlorine or other chemical disinfection systems. This technology was further considered within the planning document.

D-4. CLOSED VESSEL ULTRAVIOLET LIGHT (UV) DISINFECTION – Installation of Closed Vessel UV disinfection technology would require building the UV station on effluent piping from the new treatment facility. They function in a very similar manner as open-channel UV systems, but are generally used for smaller systems and can be very operationally intensive. This technology was not further considered within the planning documents.

Disinfection would be common to all the treatment alternatives considered. Any of the disinfection alternatives would be capable of meeting the disinfection treatment goals and could provide the level of disinfection required in the MPDES permit. Alternative evaluations have consistently pointed out that UV disinfection is the preferred choice. Chlorine gas is a significant safety threat to the facility staff, the public and the environment. Moreover, chlorination of wastewater creates by-products that have been determined to be harmful to the environment and to humans. Because the UV disinfection alternative is practical in terms of cost, environmental, and regulatory considerations, the UV alternative was selected.

C. BACK-UP POWER SUPPLY

Two alternatives were discussed in the PER which included the following:

P-1. NO ACTION – The existing facility does not have back-up power. In the event of a power failure, treatment and disinfection are compromised. This alternative does not meet the Department design standards, so was not further considered.

P-2. BACK-UP GENERATOR – Installation of a back-up generator capable of keeping critical pumps, blowers, disinfection equipment, and chemical feed systems running during a power outage. The generator will be sized to accommodate future tertiary treatment equipment electric loads as well. This alternative was selected as the preferred alternative.

IV. COST COMPARISON FOR ALTERNATIVES USING PRESENT WORTH ANALYSIS

Present worth analysis is a method of comparing alternatives in present day dollars and is used to determine the most cost-effective alternative. 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. Summaries of the present worth analyses for feasible treatment alternatives are provided in Table 1. These cost estimates were presented in the 2012 Preliminary Engineering Report for Three Forks. The costs presented are for wastewater treatment system improvements only. UV disinfection

and back-up power costs are factored into these estimates as appropriate. Salvage values are included in the Present Worth estimates. An interest rate of 4.0% over the 20-year planning period (Design Year 2032) was used in the analysis. Bold items are the preferred alternatives that will be included in this project.

TABLE 1 - ECONOMIC EVALUATION OF TREATMENT ALTERNATIVES

PRESENT WORTH COST ANALYSIS					
	A-3 Facultative Lagoons with Land Application	A-5 New Aerated Ponds with Clarifier	A-8 MBBR with Clarifier	**A-10 Complete Mix & Partial Mix Lagoons with Cover**	A-11B SBR
Total Capital Costs	$9,256,000	$4,894,000	$5,118,000	**$4,529,155**	$5,646,000
Increased O&M Costs	$67,700	$171,800	$166,800	**$179,900**	$228,100
Present Worth of O&M	$1,015,390	$2,576,721	$2,501,730	**$2,698,208**	$3,421,130
Salvage Value	$2,273,000	$1,263,000	$745,000	**$581,000**	$1,089,000
Present Worth of Salvage Value	$708,721	$393,803	$232,291	**$181,156**	$339,550
Total Present Worth Cost	$9,562,669	$7,076,918	$7,387,439	**$7,046,207**	$8,727,580
Increased User Cost	$47-$88/mo	$36-$59/mo	$37-$61/mo	**$34-$55/mo**	$45-$71/mo
Current User Cost	$32.21/mo	$32.21/mo	$32.21/mo	**$32.21/mo**	$32.21/mo
Total User Cost After Project	$79-$120/mo	$68-$91/mo	$69-$93/mo	**$66-$87/mo**	$77-$103/mo

* All capital and present worth costs presented neglect engineering, bond reserves, contingency & administrative costs.

** Costs presented are estimates based on the PER and updated inflation adjustment and are included here for information purposes only.

The most recent construction cost estimate for the proposed improvements presented in the 2012 PER is $4,529,155. The city has obtained a grant for $750,000 from the Montana Department of Commerce Treasure State Endowment Program (TSEP) and a grant in the amount of $100,000 from the Department of Natural Resources, RRGL program. The city proposes to obtain a 20-year, 3.0% interest rate loan from the DEQ State Revolving Fund program for the remainder.

The financial impact of this project is projected to increase the average residential sewer service rate from $32.21 per month to approximately $70 per month. Based on year 2000 census data, the monthly cost per household is 2.5% of the median household income. Based on EPA guidance, these rates may impose a financial burden on some of the households in the community because it exceeds 2% of median household income.

V. BASIS OF SELECTION OF PREFERRED ALTERNATIVE

Selection of the preferred alternative was based upon a decision matrix developed in the PER. The matrix ranks alternatives for technical feasibility, environmental impacts, present worth costs, public health and safety, operations and maintenance and public opinion. Public input was documented as very limited when public comments were requested. One respondent commented that the city needs to make sure the selected alternative solves the problem as a whole, or solves both current and future permit issues. Below is a decision matrix with scores and weights for each of the categories identified above:

TABLE 2 – DECISION MATRIX OF TREATMENT ALTERNATIVES[1]

	Technical Feasibility		Environmental Impacts		Present Worth Costs		Public Health & Safety		Operations & Maintenance		Public Opinion		Totals
	Weight 10		Weight 10		Weight 10		Weight 10		Weight 10		Weight 10		
A-3	10	100	8	80	6	60	9	90	10	100	10	100	530
A-5	7	70	7	70	10	100	9	90	10	100	9	90	520
A-8	8	80	9	90	8	80	9	90	10	100	10	100	540
A-10	9	90	9	90	10	100	9	90	10	100	10	100	**570**
A-11B	10	100	10	100	7	70	10	100	7	70	9	90	530

1. All alternatives provide for a 20-year design capacity.

The decision matrix indicates that Alternative A-10, Complete Mix/Partial Mix lagoon technology with UV disinfection and discharge to the Madison River is the highest rated alternative for the city of Three Forks, although the scores are relatively close. The primary factors influencing the selection are simplicity of operations and maintenance, cost effectiveness, and technical feasibility. Another intangible this alternative provides is adaptability to future tertiary treatment if necessary (for example pairing with alternative A-12 for total nitrogen reduction).

A. SELECTED ALTERNATIVES

To meet MPDES permit limits, the preliminary engineering report has determined the Three Forks wastewater facility needs to be upgraded to avoid groundwater discharge and to remove ammonia and *E.coli* bacteria prior to surface water discharge. As shown in the ranking Table 2, Alternative A.10 scored the highest primarily due to cost, operations and maintenance benefits and ranking consistently high in all other categories. The selected alternative A.10 along with D-3, UV disinfection results in a new treatment facility that will be located within the footprint of the existing lagoon system. UV disinfection was selected due to regulatory concerns, operational considerations and the safety of operations staff, the public and risk to the environment. UV equipment is proposed to be installed within the new pump house prior to discharge to the Madison River. UV disinfection will result in higher energy costs, but most of that increased cost is off-set by the reduced chemical costs associated with chlorination/dechlorination processes. This new treatment facility allows for moderately advanced treatment, growth capability, treatment enhancement in the future if needed and for meeting the required 20-year design life in a phased approach.

In addition to the treatment components, the following were supported as needed improvements within the existing facility to comply with MDEQ design standards and to enhance O&M. These additional project components are factored into the costs presented in Table 1:

- Back-up generator to support essential facilities during a power outage (DEQ requirement),
- Effluent pumping lift station and force main,
- Improvements to discharge structure into the Madison River,
- Non-potable water supply to various facility locations for tank spray down, mechanical seals and chemical mixing (combination of DEQ requirements and O&M needs),
- Minimal administrative and lab facilities building on-site in compliance with DEQ standards,
- Installation of new SCADA system for remote control access and call-out capability (O&M needs).

VI. AFFECTED ENVIRONMENT

A. PLANNING AREA & MAPS

The City of Three Forks is located in west central Montana between Bozeman and Butte along the interstate 90 corridor (see Figure 1). The sewer service area is shown in Figure 2 (Ridgeview Subdivision connection is a new addition). The service area includes residential homes, vacant lots, commercial businesses, and public entities. As shown in Figure 2, the WWTF is located at the southeast edge of the city and is included in the planning area. The proposed WWTF improvements are shown in Figure 3 and will be constructed in the northeast corner of the existing storage pond. The duration of construction for the proposed new treatment facility should be approximately 12 months.

B. FLOW PROJECTIONS

Population data from the 2010 census reflect 1,869 people live within the City of Three Forks' service area, which includes Ridgeview Subdivision. The 2012 Preliminary Engineering Report updates this to a 2012 population estimate of 1,964 people. Non-degradation load limits for the city are based on the original design basis of 2,309 people and a design flow of 0.453 million gallons per day as detailed in the 1994 MDEQ Statement of Basis. Since the 20-year equivalent design population for the community wastewater system used in the PER is 3,218 people, the facility will need to improve pollutant removal performance when the population exceeds the 2,309 persons. For this and other reasons, a flexible design approach which allows for future enhancements was chosen. The nature of the design accommodates this growth because it treats the wastewater to much higher standards, helping the city allow for increased flows without risk of exceeding "non-degradation" limits in the discharge permit.

The proposed WWTF will discharge to the Madison River via a submerged discharge pipeline under DEQ issued MPDES permit number MT0020401.

C. NATURAL FEATURES

The existing city system consists of a central collection system, one lift station, and a two-cell facultative lagoon with discharge to groundwater and the Madison River as discussed earlier within this document. The Madison River segment where Three Forks discharges is classified as B-1 according to the Montana Water Use Classification, ARM 17.30.610. B-1 waters are to be maintained suitable for drinking, culinary & food processing purposes after conventional treatment; bathing, swimming and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; agricultural and industrial water supply. This reach of the Madison River is impaired for drinking water and aquatic life uses. The Madison at this location is subject to Total Maximum Daily Load (TMDL) regulation to correct listed impairments, but the TMDL has not yet been completed.

Site topography is relatively flat within the footprint of the proposed WWTF, but effluent will be pumped from the UV facility to the Madison River outfall.

USDA soils mapping of the project site reflects a mix of Fairway-Threeriv-Riva complex, Ryell-Rivra-Fairway complex and Amesha Loam, along with several similar soil types interspersed within the planning area. These three soil types range from poorly drained silty-clay loam to fine sandy loam to well drained loamy alluvium respectively. Complex soils consist of two or more soils that are interspersed in a manner that they cannot be shown separately on the mapping unit. Further site-specific soils testing may be necessary prior to construction to determine suitability of the structures that are proposed.

Groundwater within the existing lagoon area varies between 3 to 13 feet seasonally. This shallow depth to groundwater poses significant concern related to groundwater pollution and impacts to adjacent

ponds that are interconnected with the groundwater table. Excavation at the lagoon site would likely require significant shoring and dewatering effort with any project where excavation is needed. Any dewatering would require that a permit be obtained for storage, treatment and disposal of water from the dewatering efforts.

VII. ENVIRONMENTAL IMPACTS OF PROPOSED PROJECT

A. DIRECT AND INDIRECT ENVIRONMENTAL IMPACTS

Environmental impacts anticipated from the construction of the new WWTF are expected to be minimal because work will be within the footprint of the existing facility. The new treatment facility is not expected to impact natural features or result in impacts to adjacent property owners in the area. Short-term noise and dust issues may result during construction and typical wastewater odors may result in proximity of the facility, however best management practices will be implemented to ensure minimization of these impacts.

1. Land Use – The proposed improvements will be constructed within a down-wind area of the community, away from residential settings. The work will be performed within the footprint of the existing wastewater facility in an area that is a previously disturbed parcel of land owned by the City. The construction of this improved facility will provide for expected normal growth within the community and immediate surrounding area. The proposed facility will not impact prime farmland. The City owns the site where the proposed facility will be located; therefore no additional land will be required for the proposed project.

2. Floodplain – The proposed project is located within a delineated 100-year floodplain according to the FEMA Floodway Maps and State of Montana Department of Natural Resources and Conservation floodplain management section. Work will be performed within the floodplain with respect to new improvements, but existing and new dike structure will be constructed with a finished elevation above the 100-year flood delineation. Any impacts from this work will be addressed via floodplain permitting and are expected to be minimal. Therefore, this project will require a floodplain development permit for the work.

3. Wetlands – Wetlands exist surrounding the existing lagoon facility. They are the result of shallow groundwater and runoff from adjacent properties and the existing lagoons sustaining the shallow down-gradient water table. The discharge pipeline to the Madison River will result in impacts to these marginal wetlands. The disturbed footprint of work to be performed within the wetland areas will be developed and permits will be secured to perform this work as required.

4. Vegetation – Vegetation will not be significantly affected by the proposed project. The Montana Natural Heritage Program listed no plants of concern within immediate proximity.

5. Cultural Resources – According to the Montana State Historic Preservation Office (SHPO), there appear to be no properties on or eligible for the National Register of Historic Places within the project area.

6. Fish and Wildlife – The Montana Natural Heritage Program (MNHP) listed the Long-billed Curlew, Grasshopper Sparrow, Lark Bunting, Brewers Sparrow, A Cave Obligate Amphipod, Sage Thrasher and Bobolink as species of concern within the project area. The project will not significantly affect habitats of these various species and will provide water quality benefits that will protect and reduce the risk of harm to fisheries and other animals.

7. Water Quality – Water quality will improve due to the proposed project. The proposed project will prevent water quality standards violations and provide better treatment of the wastewater. Excess

BOD and TSS and high fecal coliform numbers should not occur in the receiving stream due to the improvements. Montana nondegradation law and rules capped the allowable load based contribution of regulated pollutants. To meet these load based limitations, DEQ establishes load based limits within any permit renewal based on the allowable loads at the time nondegradation rules were approved. Once established within the permit, the load limits (pounds per day) for pollutants such as BOD, TSS, nitrogen and phosphorus will not be changed with time even though the community may grow and pollution loads increase. Accordingly, the treatment efficiency must improve with time if the community is growing. An assessment of non-degradation load limits was made in the Three Forks WWTF 2012 preliminary engineering report. Because the newly proposed WWTF will significantly improve performance with respect to BOD, TSS, nitrogen and phosphorus removal, the allowable load limits based on non-degradation will not limit projected growth. The existing wastewater treatment facility is designed to serve a population of 3,218 with a design flow of 425,000 gallons per day. Those numbers were used to establish the facility's baseline allocated non-degradation load limits (BOD and TSS) in the MPDES discharge permit. Any increase above this baseline allotment is subject to the provisions of Montana's Non-Degradation Policy 75-5-303, MCA, and would require the facility to provide a higher level of treatment for compliance.

8. Air Quality – Short-term negative impacts on air quality will 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.

9. Public Health – Public health protection will benefit from the project. The proposed UV disinfection system will disinfect the treated effluent to a level safe for contact recreation in the receiving stream and will reduce the risk currently posed by pathogens in discharged effluent. Installation of back-up power will prevent the potential for the discharge of inadequately treated effluent, virtually eliminating any existing health threat.

10. Energy – In the long term, an increase in energy consumption will occur due to blower motors, pumps, mixers, lighting, and disinfection equipment. This increased energy consumption is inevitable with implementation of advanced treatment, but will be minimized with use of energy conserving devices on blowers, pumps, and other equipment where appropriate.

11. Sludge Disposal – Any sludge disposal resulting from the project will be carried out in accordance with State of Montana Solid Waste rules, or EPA's 503 regulations. The existing lagoons are estimated to have approximately a 1-foot depth of sludge that will need to be removed after construction. The sludge will be temporarily stored in the existing lagoons for evaporative drying for a period not to exceed 2 years. It will be allowed to dry and then be disposed of at a class II landfill.

    Sludge drying beds will be used to temporarily store and dewater sludge generated at the new wastewater treatment facility. The sludge generated will be hauled to a landfill meeting State of Montana Solid Waste rules.

12. Noise – Short-term noise impacts may occur during construction. Construction will be limited to normal day-time hours to avoid early morning or late evening construction disturbances. In the long-term, noise levels in the immediate area will be slightly increased due to use of blower technology proposed at the treatment site. Blowers will be installed in a building to greatly reduce outside noise. Modern blowers are much quieter than historic blower technology and will result in no significant impact.

13. Growth – Growth within the City of Three Forks has been stable for many years. Recently there were indications that significant growth could occur, but the 2008 recession and impact that had on investors has delayed planned growth. The City has provided for reasonable growth potential and

connection of the Ridgeview Subdivision, but the facility could be scaled up in a future phase if unexpected growth necessitated.

Improvements to the WWTF will be a positive feature for the community. Improvements to the WWTF may result in secondary impacts that are associated with the growth of the community. This project would allow the City to manage its growth in a proactive manner and promote urbanization within its service area. Anticipated increase in population and development in the service area would result in increased flows to the WWTF. Secondary impacts may include impacts to: housing, commercial development, agriculture lands, solid waste, transportation, and utilities.

14. Cumulative Effects – No significant adverse cumulative impacts are anticipated.

15. 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 because of the increase in service costs due to the project costs. However, no disproportionate effect among any portion of the community is expected.

16. 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 and due to conversion to an advanced mechanical WWTF cannot be avoided.

VIII. PUBLIC PARTICIPATION

Presentations on the draft Preliminary Engineering Report (PER) were made to the city and public on 3/13/2006, 3/27/12 with the final public comment hearing on 4/10/12. Presentations were given at the city council meeting by the city's consulting engineers, public works and budget staff. There was no opposition to the project documented within the public meeting process. The recommendation was to replace the existing 2-cell facultative lagoon and I/P cell with a new complete mix aerated lagoon with two partial mix settling cells and UV disinfection facility. Provisions are being made for adding tertiary treatment for nitrogen and metals removal if necessary in a future permit cycle.

IX. AGENCY ACTION, APPLICABLE REGULATIONS AND PERMITTING AUTHORITIES

All proposed improvements will be designed to meet state standards in accordance with Circular DEQ-2, and will be constructed using standard construction methods. Best management practices will be implemented to minimize or eliminate pollutants during construction. No additional permits will be required from the State Revolving Fund (SRF) section of DEQ for this project after the review and approval of the submitted plans and specifications. However, coverage under the storm water general discharge permit and groundwater dewatering discharge permit, are required from the DEQ Water Protection Bureau prior to the beginning of construction. A 124 Permit from the Department of Fish, Wildlife and Parks, a 404 Permit from the U.S. Corps of Engineers, and a 318 Authorization from DEQ will be required for any work that occurs in a streambed or wetland, and will be obtained if necessary.

X. 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. DEQ, Permitting Files, related to discharge monitoring reports and inspection reports.
2. City of Three Forks PER Report, prepared for the City of Three Forks, by Great West Engineering, Helena, Montana, February 2006.
3. City of Three Forks PER Amendment, prepared for the City of Three Forks, by Great West Engineering, Helena, Montana, May 2012.

XI. AGENCIES CONSULTED

The following agencies have been contacted in regard to the PER, which determined the basis for the proposed wastewater treatment and collection system project:

1. The Montana Department of Fish Wildlife and Parks (FWP) was consulted, and concluded the proposed project would not negatively impact listed species, wetlands, or migratory birds and their habitats.

2. The U. S. Fish and Wildlife Service (FWS) was consulted and concluded the proposed project would not negatively impact listed species, wetlands, or migratory birds and their habitats.

3. The Montana State Historic Preservation Office (SHPO) considered the impacts of the proposed project on historical sites and cultural resources and indicated there appears to be no properties on or that are eligible for the National Register of Historic Places within the project area. The Montana State Historic Preservation Office asks to be contacted and the site investigated should cultural materials be inadvertently discovered during construction.

4. The U.S. Army Corps of Engineers (COE) reviewed the proposed project and responded that if construction activities includes the discharge of fill material, either permanently or temporarily into waters of the United States and lakes or ponds connected to the tributary system, and wetlands adjacent to these waters, then a Department of Army Section 404 permit will be required. This project is not anticipated to result in fill being placed into waters of the U.S.

5. Montana Natural Heritage Program website was consulted by the city engineers and search resulted in reports on 15 species of concern and 2 ecological site reports with explanatory material and one map. The results of this search will be used in securing any permits needed that are associated with the project.

6. Department of Natural Resources and Conservation (DNRC) reviewed the proposed project and determined that the project is located in a designated 100-year floodplain and that a floodplain permit will need to be secured for work within the project area. The construction documents will require the construction contractor to secure this contract and follow all best-management-practices required within the permit.

Recommendation for Further Environmental Analysis:

[ ] EIS [ ] More Detailed EA [X] No Further Analysis

Rationale for Recommendation: Through the 2006 and 2012 Preliminary Engineering Report and Amendment respectively, prepared by Great West Engineering and the public process involved, the City of Three Forks determined the preferred wastewater treatment system alternative will allow for compliance, improve the operation and maintenance capabilities and eliminate groundwater impacts. Through this EA, the MDEQ has verified none of the adverse impacts of the proposed WWTF Upgrade 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. This EA is the appropriate level of analysis because none of the adverse effects of the impacts are significant. A Finding of No Significant Impact (FONSI) will be issued and legally advertised in the local newspaper and distributed to a list of interested agencies. Comments regarding the project will be received for 30 days before final approval of the EA is granted.

EA Prepared By:

Terry Campbell, P.E. — 3/21/14 Date

Approved By:

Mike Abrahamson, P.E. — 3/21/14 Date

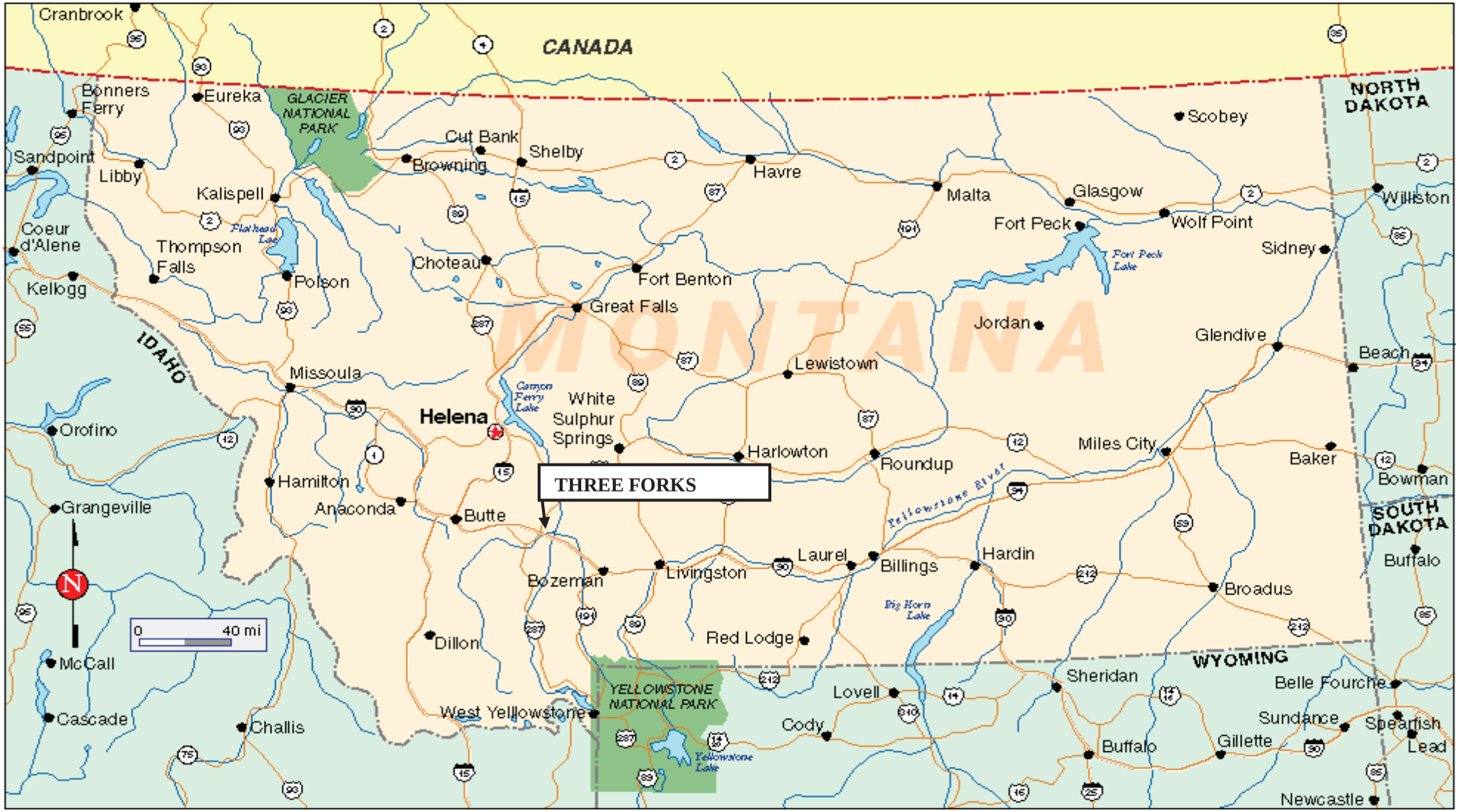

FIGURE 1
LOCATION MAP

Effluent Discharge
Location
Approximate
City Service Area
Existing WW Facility &
Site of Proposed
Improvements
Ridgeview
Subdivision

FIGURE 2

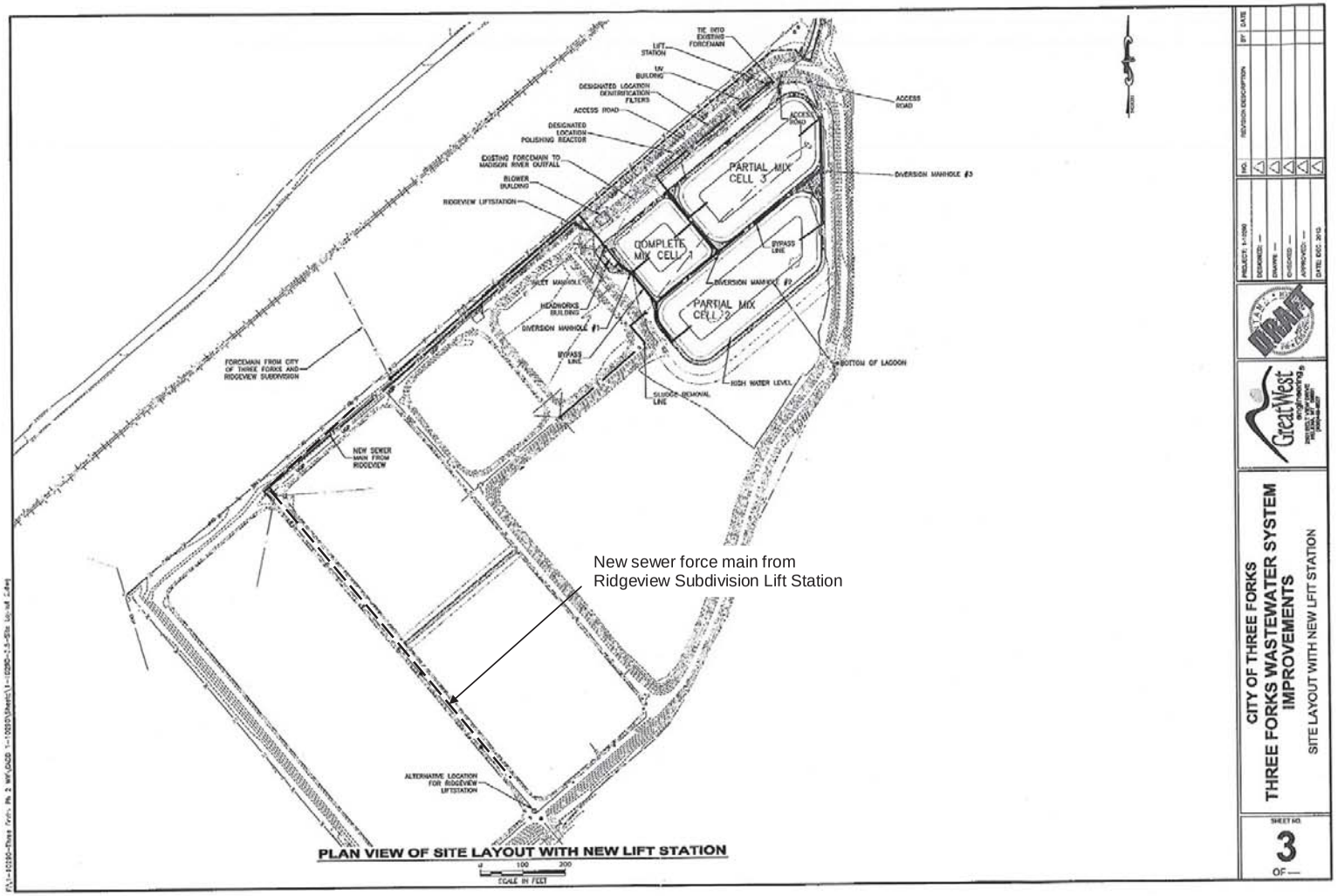
New sewer force main from
Ridgeview Subdivision Lift Station
PLAN VIEW OF SITE LAYOUT WITH NEW LIFT STATION
CITY OF THREE FORKS
THREE FORKS WASTEWATER SYSTEM
IMPROVEMENTS
SITE LAYOUT WITH NEW LIFT STATION
SHEET NO.
3
OF —
GreatWest
engineering
DRAFT
PARTIAL MIX
CELL 3
COMPLETE
MIX CELL 1
PARTIAL MIX
CELL 2
ACCESS ROAD
DIVERSION MANHOLE #3
DIVERSION MANHOLE #2
DIVERSION MANHOLE #1
BYPASS LINE
HIGH WATER LEVEL
BOTTOM OF LAGOON
SLUDGE DEMOVAL LINE
FORCEMAIN FROM CITY OF THREE FORKS AND RIDGEVIEW SUBDIVISION
NEW SEWER MAIN FROM RIDGEVIEW
ALTERNATIVE LOCATION FOR RIDGEVIEW LIFTSTATION
RIDGEVIEW LIFTSTATION
BLOWER BUILDING
EXISTING FORCEMAIN TO MADISON RIVER OUTFALL
DESIGNATED LOCATION POLISHING REACTOR
ACCESS ROAD
DESIGNATED LOCATION DENITRIFICATION FILTERS
UV BUILDING
LIFT STATION
TIE INTO EXISTING FORCEMAIN
SCALE IN FEET

FIGURE 3