



Montana Department of
ENVIRONMENTAL QUALITY

Steve Bullock, Governor
Tracy Stone-Manning, Director

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March 14, 2014

Kevin Dorwart, Operations Manager
City of Glendive
300 South Merrill
Glendive, MT 59330

RE: Montana WPCSRF Project, C301251, Glendive WRRF Environmental Analysis, Montana

Dear Mr. Dorwart:

Enclosed is a copy of the Finding of No Significant Impact (FONSI) and Environmental Assessment (EA) for the City of Glendive Water Resource & Recovery Facility project. Please print just the FONSI letter in one publication of your local paper under legal advertising and return the proof of advertising. You do not have to print 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.

If you have any questions, please do not hesitate to contact me at (406) 444-5322.

Sincerely,

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

Encl. FONSI, Glendive Water Resource & Recovery Facility Project
EA, Glendive Water Resource & Recovery Facility Project

cc: Amy Deitchler, PE, Great West Engineering, Inc. (via e-mail)
John Wadhams, DEQ Water Protection Bureau (via e-mail)
Anna Miller, DNRC, CARRD (via e-mail)
Tom Livers, DEQ Directors Office (via e-mail)

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GALLATIN AIRPORT AUTHORITY
GALLATIN FIELD AIRPORT
BELGRADE MT 59714

FONSI&EA_DistributionList.doc



March 11, 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 Glendive Wastewater Treatment Facility Upgrade
Location	Glendive, Montana
Project Number	WPCSRF Project # C301251
	Total Cost - \$14,153,280

The City of Glendive, through its April 2012 Preliminary Engineering Report (PER) and November 2013 Basis of Design Report, prepared by Great West Engineering. (Engineer), has identified the need to make significant changes to their wastewater treatment system. The current WWTF was constructed in 1975 and designed to operate as a facultative lagoon with surface water disposal to Glendive Creek. Upgrades were made in 1998 to add aerated transfer between ponds. Wastewater is collected via gravity sewers and then pumped via four lift stations under Glendive Creek up the hill to the lagoon system

The purpose of the project is to provide a new wastewater treatment system that will meet the treatment requirements contained within the city discharge permit. The new facility would also allow the city to abandon the sewer force main that currently passes under Glendive Creek. That force main has been severely eroded several times over the past several years, resulting in line breaks and direct untreated sewage discharge to Glendive Creek. The city cannot meet the MPDES discharge permit with respect to BOD and TSS in the effluent. The city proposes construction of a new wastewater treatment facility that will eliminate the crossing of Glendive Creek. The proposed treatment facility would include construction of a sequencing batch reactor treatment facility with UV disinfection and a new discharge pipeline that will re-direct flow to the Yellowstone River directly. This new treatment facility will allow for enhanced treatment with respect to BOD, TSS, ammonia and *E.coli* bacteria. The new treatment facility will allow for connection of the West Glendive wastewater system in a future project that will allow that system to also comply with discharge permit compliance issues.

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.

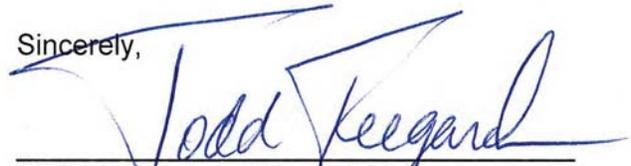
An environmental assessment (EA), which describes the project and analyzes the environmental impacts in more detail, is available for public scrutiny on the DEQ web site (<http://www.deq.mt.gov/ea.mcp>) and at the following locations:

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

Kevin Dorwart, Director of Operations
City of Glendive
300 S Merrill Ave
Glendive, MT 59330

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, Bureau Chief
Technical and Financial Assistance Bureau

**CITY OF GLENDIVE
WASTEWATER TREATMENT FACILITY UPGRADE**

ENVIRONMENTAL ASSESSMENT

I. PROJECT SUMMARY INFORMATION

A. PROJECT IDENTIFICATION

Name of Project: Wastewater System Improvements
Applicant: City of Glendive
Address: 300 South Merrill
Glendive, MT 59330
DEQ Project Number: C301251

B. CONTACT PERSON

Name: Kevin Dorwart, Operations Manager
Address: 300 South Merrill
Glendive, MT 59330
Telephone: (406) 377-3318 ext 17

C. ABSTRACT

The City of Glendive is proposing upgrades to the existing city wastewater treatment facility. The city (in an April 2012, Wastewater Preliminary Engineering Report (PER), prepared by Great West Engineering) identified the need to upgrade the wastewater treatment facility (WWTF). The existing wastewater treatment facility consists of central collection, five lift stations and a 3-cell facultative lagoon system with discharge to Glendive Creek under Montana Pollution Discharge Elimination System (MPDES) permit number MT0021628. Improvements are necessary for the city to meet its discharge permit limits and sustain growth within the community. The existing wastewater treatment facility is not consistently meeting existing permit limits for total suspended solids (TSS) and biological oxygen demand (BOD).

Glendive Creek is on the 2012 DEQ 303(d) impairment list and is subject to Total Maximum Daily Load (TMDL) regulation to correct identified impairments. The TMDL has not yet been completed for Glendive Creek but is expected to lead to restrictive discharge limits. The causes of impairment include ammonia, metals (including lead, copper, cadmium, chromium, iron, nickel, selenium & zinc), loss of literal vegetative cover and suspended solids. The metals and suspended solids are carried in sediments. Because of these impairments, and because under low flow conditions, Glendive Creek is effluent dominated from the discharge location until it blends with the Yellowstone River, the city has determined continued discharge to Glendive Creek would require treatment technology in excess of what is affordable.

The selected alternative involves upgrading treatment, and securing a modification to the discharge permit to move discharge from Glendive Creek to the Yellowstone River directly. That permit application has been made and is pending a decision by DEQ. The Yellowstone River at this location does not have impairment issues which will lead to similar discharge permit provisions. The wastewater treatment facility upgrade will help the city improve treatment and meet enhanced secondary standards (i.e. 85% removal of BOD and TSS), ammonia and *E.coli* permit limits. The project will also result in elimination of the force main that crosses Glendive Creek, eliminating further force main erosion and breakage.

The proposed facility will be built on city owned property on the west side of Glendive Creek as depicted in Figure 4 at the end of this document. The alignment for the new sewer force main leading to the new discharge location is on city owned property or secured via easement as shown in Figure 4. The existing Glendive Creek crossing and existing treatment lagoons, also on city property will be cleaned up and abandoned upon completion of the new facility.

Major WWTF improvements include:

- New headworks building with screening and grit removal equipment;
- New control building to house aeration blowers, electronics and laboratory;
- A two-basin sequencing batch reactor (SBR) nutrient removal treatment facility;
- Post equalization basin to aid with effluent flow control;
- Solids aeration basin for decanted sludge storage;
- Sludge handling/dewatering building with solids press and truck load-out facility;
- New pump station and discharge sewer main to the Yellowstone River;
- UV disinfection channel & equipment;
- New standby power generator; and
- Rehabilitation of the existing lagoon site.

Federal and State grant/loan programs will fund the project. The proposed improvements are estimated to cost approximately \$13,766,280. The project will be funded through a low interest loan (3.0 % interest rate) obtained from DEQ's, 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 DEQ has reviewed and approved the plans and specifications for the project. Under the Montana Water Pollution Control State Revolving Fund Act, DEQ may loan money to municipalities for construction of public sewage systems.

DEQ's, 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 Glendive WWTF was originally constructed in 1906 with the majority of the collection system installed prior to 1930. Many upgrades have occurred since that time, but much of the collection system is original. The lagoon cells were constructed in 1975 and updated with new aerated transfer structures in 1998 to enhance biological activity and dissolved oxygen concentrations. The existing WWTF is not capable of consistently meeting current discharge permit limits for BOD and TSS. The TSS permit limit was made more stringent in the last permit cycle. The city has had multiple TSS

discharge violations and cannot consistently meet this permit limit with the current treatment facility. Permit limits for *E.coli* bacteria will be added to the new permit and disinfection equipment will be necessary to meet this new limit.

In addition to the need for improved treatment, the force main that crosses Glendive Creek is at continuing risk of flood erosion and breakage during spring flow in Glendive Creek. This 16 inch force main has been exposed and broken due to stream erosion on three separate occasions, spilling raw wastewater into Glendive Creek and resulting in an estimate of over one million gallons of discharge to the stream. The city has made alignment adjustments and repaired the pressure main on two occasions. There are still concerns it will be exposed again at some future point resulting in further untreated discharge. The city has determined it best to eliminate this stream crossing. In 2011, the city was fined by DEQ for an untreated discharge event to Glendive Creek due to stream bank erosion. The new treatment facility will be located on the west side of Glendive Creek, eliminating the stream crossing.

The current MPDES discharge permit was issued in 2007, was administratively extended in 2012 and is due to be renewed in 2014. The new permit will contain more restrictive limits for BOD and TSS and new limits for *E.coli* and ammonia if the existing discharge location in Glendive Creek is maintained. Glendive Creek, from the current effluent discharge location to the confluence with the Yellowstone River is at times dominated with effluent when under low flow conditions. Because of this situation, ammonia toxicity limits will be imposed to protect fish and aquatic life within that lower reach. Metals limits will also be included for lead, copper, arsenic and possibly other metals. *E.coli* limits will be required for any treatment and discharge configuration. The existing lagoon facility cannot achieve the level of treatment necessary to comply with these new permit constraints. It has been determined by the city that any new facility would not be able to meet permit limits if discharge to Glendive Creek were to continue. The city is currently asking DEQ to issue a permit modification to allow them to discharge directly to the main flow of the Yellowstone River within a permit application submitted to DEQ in September 2013.

West Glendive Sewer District is also addressing permit compliance issues and more restrictive discharge limits. The West Glendive Sewer District (Dawson County) has negotiated a Memorandum of Understanding with Glendive to accept its wastewater in lieu of upgrading its own facility. In this manner, the two public entities can cost share the expense of operating and maintaining the new wastewater treatment facility. Each community will be responsible for the capital costs associated with work to address its own respective infrastructure. West Glendive would deliver the untreated effluent via pumped force main over the Towne Street Bridge to the city's pressure main. West Glendive has prepared a separate PER and plans to proceed with building this transfer force main upon completion of the Glendive treatment facility. Glendive would own and maintain the new treatment facility and collection system to the point where West Glendive ties into the city force main. West Glendive will be responsible for the collection system from that connection back across the bridge and throughout the extent of the West Glendive service area. West Glendive will be responsible to pay the city for the percent of use of the debt service for the new wastewater treatment facility. In that manner, those users will pay a fair share of the operations and maintenance associated with the wastewater treatment facility, but the infrastructure will be owned and controlled by the city.

In order to address permit limits and provide capacity for flows and loads through the planning period, the City of Glendive WWTF will need to be upgraded and additional treatment processes added. The discharge permit will require more advanced treatment capable of improved BOD and TSS removal and providing for disinfection of the final effluent. The new facility is planned in two phases. The first phase will complete two sequencing batch reactors and other improvements noted above, capable of treating flows from Glendive and West Glendive up to an average day flow of 1.3 million gallons per day. A third reactor basin can be added as a future project if expected growth

occurs. The third reactor would provide for the predicted 20-year design average day flow of 1.9 million gallons per day of capacity. The second phase would not be completed if growth does not dictate the need.

The MPDES discharge permit load limits for BOD, TSS and nutrients, currently held by West Glendive, will be credited to Glendive using a permit trading mechanism. In that manner the new load limits in the MPDES discharge permit will allow a higher pollutant load than what is currently allowed in the MPDES permit held by the city, but not higher than the load for the combined systems.

III. ALTERNATIVES INCLUDING THE PROPOSED ACTION

A. SECONDARY / ADVANCED TREATMENT TECHNOLOGIES

There were five alternative treatment technologies and the “no action” alternative considered in the PER and Pre-Design Memorandum. The treatment alternatives evaluated included the following:

A-1. NO ACTION – The existing 3-cell facultative lagoon treatment facility is at the end of its useful design life and cannot meet current discharge permit limits. Therefore, this alternative was not considered to be a viable alternative.

A-2. MECHANICALLY AERATED LAGOON WITH STORAGE AND IRRIGATION – This alternative would convert a primary lagoon cell to two aeration basins and add a 15 acre winter storage pond, with seasonal discharge to irrigation pivots for agricultural use. The land application areas would need to be approximately 300 acres for a community the size of Glendive. The operations costs to power the blowers to support aeration, operation of two large pumps to send effluent to the irrigation site and center pivots would result in significant energy bills and operational intensity. On the other hand this alternative could eliminate the maintenance of a discharge permit under the MPDES program. This alternative would result in maintaining the pressure sewer crossing Glendive Creek and the existing lagoon facilities and did not allow for connection of the West Glendive wastewater system. This alternative was further considered within the planning document.

A-3. BIOLOGICAL NUTRIENT REMOVAL (BNR) PACKAGE MECHANICAL TREATMENT – This alternative would include development of approximately 6 acres with a new headworks (debris screening and grit removal) facility, biological treatment basins, solids digester(s), ultra violet disinfection and office/lab facility. There are many forms of BNR that were screened via this alternative due to expectations that each will perform similarly and cost comparisons would be fairly close. BNR facilities are full-time operator facilities with significant oversight. Management of these facilities requires well trained staff. They must understand the biomechanical mechanisms and facilitate performance expectations by manipulating the process under changing conditions. This alternative was further considered within the planning document.

A-4. SEQUENCING BATCH REACTOR (SBR) MECHANICAL TREATMENT – This alternative is a form of BNR similar to (3) above, however the advantage is a smaller footprint and fairly significant automation and remote monitoring capability. The advanced automation associated with this process can assist in reducing operation intensity. Again, pretreatment via screening and grit removal would be included, as would sludge digestion and ultra violet disinfection. Disadvantages to this alternative include a need to buffer significant flow changes and needed redundancy in the pumping and treatment processes. This alternative was further considered within the planning document.

A-5. LAGOON/MOVING BED BIOFILM REACTOR (MBBR) – In the MBBR process, fixed film bacteria grow on buoyant plastic media that is aerated by coarse bubble aeration within a

concrete basin resembling an activated sludge basin. Effluent screens keep the plastic media from washing out. Excess biological growth will continuously slough off the plastic media and settle out in the basin. Unlike activated sludge treatment, MBBR is a once-through process with no sludge recycle. MBBR plants are fairly easy to operate and can provide for full nitrification (ammonia removal) and fair levels of denitrification (nitrate reduction). Biological phosphorus removal is not possible with MBBR treatment, however this MBBR process can be upgraded to include a sludge recycle loop and then biological phosphorus removal can be accomplished. The amount of sludge that accumulates would increase with this technology, resulting in more frequent sludge removal. There is essentially no process control capability for the MBBR system, except for adjusting the dissolved oxygen concentration to convert ammonia. In the near-term, this technology could work for Glendive, but would result in maintaining the pressure sewer crossing Glendive Creek and the existing lagoon facilities. This alternative was further considered within the planning document.

A-6. INTEGRATED FIXED FILM ACTIVATED SLUDGE (IFAS) PROCESS – This alternative is an enhancement of alternative (5) above. It would also utilize buoyant media to establish fixed film bacterial for the conversion of ammonia to nitrite/nitrate. IFAS differs from MBBR in that a recycle loop is added to return activated sludge to the head of the basin to enhance biological treatment. In this manner, it can accomplish both nitrate and phosphorus removal. This alternative would result in maintaining the pressure sewer crossing Glendive Creek and the existing lagoon facilities. This alternative is an enhancement to (5), but is a high cost addition and was not further considered within the planning document.

B. DISINFECTION TECHNOLOGIES

Three alternative disinfection technologies were discussed in the PER. The disinfection alternatives considered included the following:

B-1. NO ACTION – The existing 3-cell facultative lagoon treatment facility cannot meet discharge permit limits with respect to pathogen (*E.coli*) control. Therefore, this alternative was not considered to be a viable alternative.

B-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.

B-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.

B-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 for Glendive.

Disinfection would be common to all the treatment alternatives considered. Any of the disinfection alternatives with the exception of B-1, 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:

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

C-2. BACK-UP GENERATOR – Installation of a back-up generator capable of keeping critical pumps, blowers and chemical feed systems, including disinfection running during a power outage. 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 November, 2013 Design Report for Glendive. 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

Alternative Number (From Above)	Alternative	Total Capital Cost For Treatment	Present Worth O&M	Present Worth (Includes Salvage)
A-2	Mechanically Aerated Lagoon with Storage & Irrigation	\$14,393,700	\$3,242,650	\$17,636,350
A-3	Biological Nutrient Removal (BNR) Package Mechanical Treatment	\$14,829,440	\$3,789,000	\$18,618,440
A-4	Sequencing Batch Reactor (SBR) Mechanical Treatment	\$13,766,280	\$3,738,700	\$17,504,980
A-5	Lagoon/ Moving Bed Biofilm Reactor (MBBR)	\$11,139,000	\$2,725,000	\$13,864,000
B-3	Open Channel Ultraviolet light (UV) Disinfection	\$237,000	\$135,900	\$372,900
C-2	Back-up Generator	\$150,000	\$27,180	\$177,180
Total Estimated Present Worth Cost				\$18,055,060

* All capital and present worth costs presented include 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.

Alternative A-4 was chosen over alternative A-5 because A-5 would retain the Glendive Creek crossing, which would result in added cost to re-construct using directional drilling or other advanced technology. That added cost is not reflected in Table 1. A-5 technology has not been used previously in Montana and there could be cold weather performance issues that are not adequately identified with this relatively new technology. Also, A-5 costs reflect the cost if discharge to Glendive Creek were maintained. Since the time when those costs were developed, it has been determined that continued discharge to Glendive Creek would not meet permit conditions with this treatment technology.

The total capital cost for the improvements are estimated to be \$14,153,280. 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 loan from the Montana State Revolving Fund program for the remainder.

The financial impact of this project is projected to increase the average residential sewer service rate for city services from \$25.40 per month to approximately \$54 per month. This rate increase will occur through implementation of annual increases over the next three years. Once the West Glendive force main is complete and the city begins accepting the flow and load from West Glendive, a fair share rate structure will be assessed to ensure West Glendive shares in the operations and debt service for the new WWTF. Based on the EPA guidance for project affordability, the monthly cost per household is 1.4% of the median household income based on year 2011 census data and therefore is not expected to impose an economic hardship on household income because the cost does not exceed 2% of median household income.

A. BASIS OF SELECTION OF PREFERRED ALTERNATIVE

Selection of the preferred alternatives was based upon multiple criteria, both monetary and non-monetary. Ranking criteria are shown in Table 2. Alternatives for wastewater treatment and disinfection were compared relative to one another based on the following criteria: technical feasibility, environmental impacts, financial feasibility, public health and safety, operation and maintenance considerations and public comments. For each comparison criteria, a weighted score from 5 to 10 points was assigned and then each alternative was ranked.

TABLE 2 BIOLOGICAL TREATMENT COMPARISON				
Comparison Criteria (weight factor)	(Up to 10 points allowed x weight factor)			
	A-2	A-3	A-4	A-5
	Mechanically Aerated Lagoon with Storage & Irrigation	Biological Nutrient Removal (BNR) Package Mechanical Treatment	Sequencing Batch Reactor (SBR) Mechanical Treatment ¹	Lagoon/ Moving Bed Biofilm Reactor (MBBR)
Technical Feasibility (8 wt)	6	8	8	5
Environmental Impacts (5 wt)	8	7	7	5
Financial Feasibility (10 wt)	3.5	3.9	4.7	6.5
Public Health & Safety (6 wt)	5	7	7	5
Operation & Maintenance (10 wt)	7	6	5	6
Public Comments (5 wt)	5	7	7	5
WEIGHTED SCORE TOTAL	247	275	273	237

¹ Alternative A-4 provides a very similar treatment scheme as alternative A-3, but allows more flexibility with a phased construction approach. Because these two alternatives are effectively equal per the ranking process, the city has chosen to select the SBR alternative for the adaptability to growth. A second phase of construction would be necessary if the design capacity is reached. All alternatives provide for a 20-year design capacity.

B. SELECTED ALTERNATIVES

To meet discharge limits, the Preliminary Engineering Report has determined the Glendive wastewater discharge should be moved to the Yellowstone River and the existing facility should be abandoned to allow for better treatment and elimination of the crossing under Glendive Creek. Future permit limits for ammonia, *E.coli* bacteria and metals make Glendive Creek an undesirable discharge location due to effluent domination under low flow conditions. As shown in the ranking Table 2, Alternatives A-3 & A-4 scored the highest primarily due the cost advantage and the lessened risk in meeting future permit limits. The selected alternative A-4 along with UV disinfection results in a new treatment facility that will be located on the west side of Glendive Creek near the Meissner baseball complex. This new treatment facility allows for advanced treatment, growth capability and for meeting the required 20-year design life in a phased approach.

Open channel UV disinfection (alternative B-3) was selected due to regulatory concerns, operational considerations, safety of the public and risk with respect to permit compliance. UV equipment is proposed to be installed within the new treatment facility on the effluent line prior to discharge to the Yellowstone River. UV disinfection is a more energy intensive approach, which will result in higher energy costs, but most of that increased energy cost is off-set by the reduced chemical costs. UV is also more protective of the operations staff and viewed as safer for the environment.

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 above:

- Back-up generator to support essential facilities (alternative C-2) during a power outage (DEQ requirement),
- Effluent pumping lift station and force main,
- Discharge structure into Yellowstone 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),
- Sludge aeration tank, dewatering equipment and haul-off to City landfill,
- New perimeter fence with secure chain link fence as deemed necessary (O&M needs),
- 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).

V. AFFECTED ENVIRONMENT

A. PLANNING AREA

The City of Glendive is located in eastern Montana within 35 miles of the North Dakota border on US 94 (see Figure 1). The sewer service area is shown in Figure 2 (West Glendive service area not shown). The service area includes residential homes, vacant lots, commercial businesses, and public entities. As shown in Figure 2, the WWTF is located at the eastern boundary of the city and is included in the planning area. The proposed WWTF improvements are shown in Figure 3 and will occur at this new location. The duration of construction for the proposed new treatment facility should be approximately 18 months.

B. FLOW PROJECTIONS

Population data from the Basis of Design Report, dated June 2013, also prepared by Great West Engineering, reflects a current service population of 6,895 persons, which includes an estimate of 1,948 persons in the West Glendive district. The phase I design population, which includes West Glendive and some growth within the city is for 10,122 persons. The phase II population, which is an estimate of the service population 20-years from now, is for 16,122 persons. The existing annual average flow for Glendive and West Glendive combined is 0.977 million gallons per day. The phase I design flow provides service for 1.3 million gallons per day and phase II would support up to 1.9 million gallons per day of flow. The historic population in Glendive and Dawson County has followed the boom and bust nature of oil production in the area. Population peaked at approximately 7,000 people within the City around 1960 and then declined until the Bakken oil field renewed very moderate growth after 2000.

The proposed WWTF will discharge to the Yellowstone River via a discharge structure under DEQ issued discharge permit (MPDES permit number 0021628).

Montana nondegradation rules and a related court decision capped the allowable load based contribution of regulated pollutants in 1994. To meet these load based limitations, DEQ establishes load based limits within any permit renewal based on the allowable loads at the time of the court decision. 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 load increases. Accordingly, the treatment efficiency must improve with time if the community is growing. Non-degradation load limits for the city are based on a design flow of 1.9 million gallons per day as detailed in the August, 1998 MDEQ Statement of Basis. Because the 20-year design does not exceed the flow rate or population estimate used in the 1998 calculations, the existing non-degradation load limits will be carried forward. However, the nature of the design accommodates some growth beyond these load based limits 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.

C. NATURAL FEATURES

The existing city system consists of a central collection system, five lift stations and a three-cell facultative lagoon with discharge to Glendive Creek. Glendive Creek has been assigned a "use class" C-3 under the EPA stream classification model. Waters classified C-3, under ARM 17.30.629, are to be maintained suitable for bathing, swimming, and recreation, and growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl, and furbearers. The quality of these waters is naturally marginal for drinking, culinary, and food processing purposes, agriculture, and industrial water supply. When a water body does not meet, or is not expected to meet, the state's water quality standards after full implementation of technology-based controls, it is considered impaired. Waters are placed on the 303(d) list when it is determined they need a "total maximum daily load" (TMDL) control or the TMDL has not yet been approved by the Environmental Protection Agency. Glendive Creek is listed on DEQ's 303(d) list as not fully supporting aquatic life standards. The TMDL for this stream section has not been completed yet.

Site topography is relatively flat within the footprint of the proposed WWTF, but falls off quickly toward Glendive Creek to the northeast. The effluent main will first climb from the treatment plant site and then drop quickly to the Yellowstone River outfall. This discharge topography cannot be avoided, necessitating the new discharge pumping station. Approximately 100 feet southeast of the proposed improvements the topography drops off rapidly to Glendive Creek. The elevation of Glendive is approximately 2,100 feet above sea level.

Soils within the project planning area are Lonna silt loam to Havre silt loam and Glendive silt loam. These are generally very deeply distributed soils, which are well drained soils formed in alluvium

derived from semiconsolidated loamy sedimentary beds, and glaciofluvial and glaciolacustrine deposits. These soils are not generally significant with respect to prime farmlands. Groundwater within the planning area is heavily influenced by the Yellowstone River, Glendive Creek and their seasonal fluctuations. Groundwater depths are generally between five and fifteen feet below surface within the planning area. Dewatering of excavations will be necessary under permit.

Environmental impacts anticipated from the construction of the new WWTF are expected to be minimal. 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 local proximity of the facility, however best management practices will be implemented to ensure minimization of these impacts.

VI. ENVIRONMENTAL IMPACTS OF PROPOSED PROJECT

A. DIRECT AND INDIRECT ENVIRONMENTAL IMPACTS

1. Land Use – The proposed improvements will be constructed within a down-wind area of the community, away from residential settings. The small footprint of the new WWTF will minimize impacts and the land area selected 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 well outside of a delineated 100-year floodplain according to the FEMA Floodway Maps and State of Montana Department of Natural Resources and Conservation floodplain management section. Some work will be performed within the floodplain to install the discharge pipeline, but 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 that small portion of the work.
3. Wetlands – No wetlands exist within the immediate area or adjacent areas. Therefore wetlands will not be affected by the proposed project.
4. Vegetation – Vegetation will not be significantly affected by the proposed project. The Montana Natural Heritage Program listed no plants of concern.
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) did not list any species of concern within the project planning area. The project will not significantly affect any wildlife habitats 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. Ammonia toxicity, nutrient loading and high fecal coliform numbers should not occur in the receiving stream due to the wastewater with the proposed system. The “total maximum daily load” (TMDL) for the Yellowstone River at Glendive has not been completed, but enough background water quality work has been to determine there is no “reasonable potential” for Glendive’s effluent discharge to impact the beneficial uses. Total nitrogen and phosphorus

permit limits are not expected within this section of river. The river section is however listed on DEQ's 303(d) list as impaired for aquatic life and warm water fishes as a result of the "Intake" diversion dam down river. As a result, future discharge permits for the city may include ammonia and *E.coli* limits, which the selected project will address.

Montana nondegradation rules and a related court decision capped the allowable load based contribution of regulated pollutants in 1994. To meet these load based limitations, DEQ establishes load based limits within any permit renewal based on the allowable loads at the time of the court decision. 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 Glendive WWTF 2006 & 2012 preliminary engineering reports. 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 6,895 with a design flow of 977,000 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 impacts will be minimized with the proposed project. Removal of the sewer main crossing at Glendive Creek will prevent untreated effluent from reaching the stream in the future. The proposed UV disinfection system will adequately disinfect the treated effluent to a level safe for human contact in the receiving stream and will reduce the potential 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, facility lighting and the disinfection equipment planned. This increased energy consumption is inevitable with the implementation of advanced treatment equipment, but will be minimized with use of energy conserving devices on blowers, pumps and 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 have not had sludge removed since the last upgrade in 1998. The depth of sludge in the first lagoon cell was estimated at about 1.9 feet in 2009. Upon completion of the new WWTF, sludge will be allowed to dry via evaporation for up to 2-years. Then it will be either land applied or hauled to the City landfill, which is a Class II landfill capable of accepting these solids after they dry. If the sludge is to be land applied for agricultural use under an EPA 503 permit the land site must be identified and further public and environmental review of this approach may be required.

Aeration will be used to stabilize sludge and pressing will be used to 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, or to a land application site permitted by EPA under 503

regulations. If land application is chosen by the city in the future, they will be responsible for giving public notice and approval of the site, haul route and procedures to be used.

12. Noise – Short-term impacts from excessive noise levels may occur during the construction activities. 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 Glendive has fluctuated throughout its history as a result of impacts associated with oil and gas development. Presently a moderate amount of growth has resulted from development in the Bakken formation. It is unknown if that growth will be sustained. The city has provided for reasonable growth potential, but generally has planned the project in a phased approach to address growth if and when it occurs in the future.

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. The 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 impacts are anticipated.

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.

VII. PUBLIC PARTICIPATION

Presentations on the draft Preliminary Engineering Report (PER) were made to the City of Glendive on 8/17/10, 10/19/10, 2/15/11, with the final public comment hearing on 3/26/11. Presentations were given at the city council meeting by the city's consulting engineers, public works staff and budget staff. There was no opposition to the project documented within the public meeting process. The recommendation was to replace the existing lagoon wastewater treatment facility with a new sequencing batch reactor treatment facility on the west side of Glendive Creek in the project planning area as depicted in figure 2.

VIII. REFERENCE DOCUMENTS

The following document has been utilized in the environmental review of this project and is considered to be part of the project file:

1. DEQ, Permitting Files, related to discharge monitoring reports and inspection reports.
2. DEQ, 303(d) List, related to impairments on Glendive Creek and the Yellowstone River.
3. City of Glendive PER Report, prepared for the City of Glendive, by Great West Engineering, Helena, Montana, April 2012.
4. City of Glendive Basis of Design Report, prepared for the City of Glendive, by Great West Engineering, Helena, Montana, June 2013.

IX. 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, but did not respond to requests for comment. It is concluded they do not foresee any impacts to listed species of wildlife, or to nongame species of special interest or concern.
2. The U. S. Fish and Wildlife Service (FWS) was consulted, but did not respond to requests for comment. It is 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 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 State and lakes or ponds connected to the tributary system, and wetlands adjacent to these waters, then a Department of Army Section 404 permit may 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 the database did not locate any riparian wetlands that the project would impact.
6. Department of Natural Resources and Conservation (DNRC) reviewed the proposed project and determined that the project is not located in a designed 100-year floodplain and that the project will not have an impact on the 100-year floodplain for this area.

Recommendation for Further Environmental Analysis:

EIS More Detailed EA No Further Analysis

Rationale for Recommendation: Through the Utility Plan and Pre-design report, prepared by HDR, Inc. and the public process involved, the City of Glendive determined the preferred wastewater treatment system alternative will improve the operation and maintenance capabilities of their system. 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.

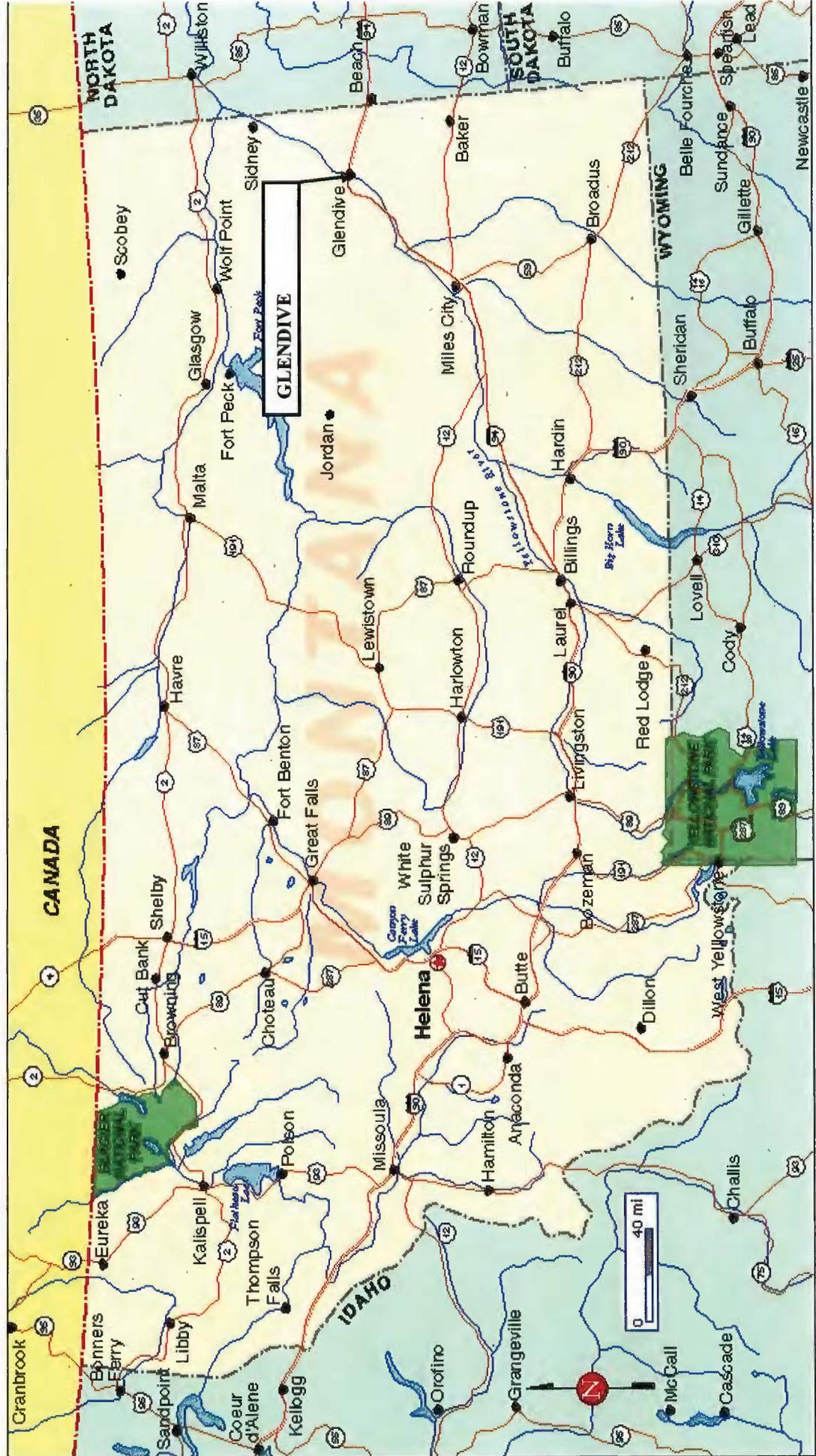
3/14/14
Date

Approved By:



Mike Abrahamson, P.E.

3/12/14
Date



**FIGURE 1
LOCATION MAP**

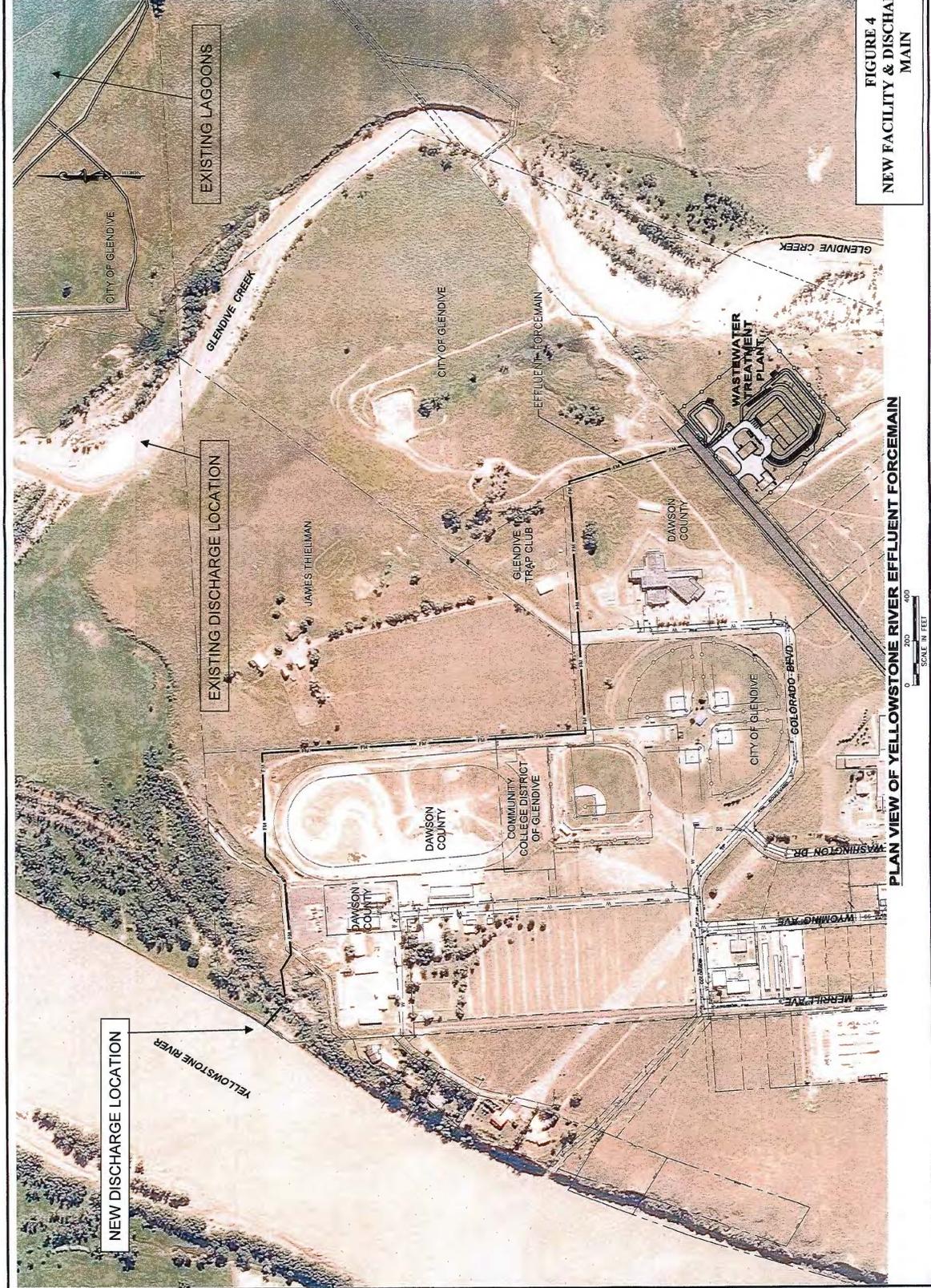
NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-09180
 DESIGNED: AMJ, DMP, SKH
 DRAWING: BLR, LAMW
 CHECKED: DAM
 APPROVED: CMP
 DATE: FEBRUARY 7, 2014



**CITY OF GLENDIVE
 WATER RESOURCE AND RECOVERY
 FACILITY
 EFFLUENT FORCEMAIN SITE PLAN**

**FIGURE 4
 NEW FACILITY & DISCHARGE FORCE
 MAIN**



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