TEN MILE/PLEASANT VALLEY WASTEWATER SYSTEM IMPROVEMENT PROJECT
TEN MILE ESTATES SEWER DISTRICT

ENVIRONMENTAL ASSESSMENT

I. COVER SHEET

A. PROJECT IDENTIFICATION

Applicant:	Ten Mile Estates County Sewer District
Address:	PO Box 103
	Helena, MT 59865
Project Number:	WPCSRF #C301255
	STAG # XP98860801

B. CONTACT PERSON

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C. ABSTRACT

The August 2008 Preliminary Engineering Report (PER), December 2012 PER Update for the Ten Mile/Pleasant Valley Wastewater Subdivisions, and PER Amendment July 2013, prepared by Great West Engineering, Inc., have identified the need to replace the existing wastewater treatment facility and repair approximately 4,000 feet of the gravity sewer collection pipe. Although improvements for the entire wastewater system are needed immediately, the improvements will be split into three phases. This allows time for the District to obtain wastewater flow data to design the new treatment system. The first phase of improvements was completed in the spring of 2013 and included numerous spot repairs to the collection system to reduce the amount of inflow/infiltration. The Phase 2 improvements will be completed during the fall of 2013 and will include improvements to the collection system, a new lift station, and a new force main. A liner will be installed in an irrigation canal adjacent to the Pleasant Valley Subdivision to reduce the groundwater level within the subdivision. The Phase 3 improvements, scheduled to begin construction in the spring of 2015, will consist of upgrading the existing wastewater treatment system.

The Ten Mile Estates and Pleasant Valley Subdivisions (Subdivisions) are located about two miles north of Helena, Montana, in Lewis and Clark County. The Subdivisions include approximately 806 residents on 310 services. Constructed in 1978, the total retention wastewater treatment system was designed and approved to include two aerated treatment cells and three storage cells for 314 homes. The two treatment cells were to be lined with a PVC liner and the three storage cells were to be lined with a natural clay and bentonite soil liner to prevent treated water from rapidly percolating into the ground. However, only one treatment cell and one storage cell were lined and the third and fourth storage cells were never fully completed. The aeration system was never been installed in either treatment cell.

It has been demonstrated by Great West Engineering, Inc. (GWE) and the Montana Department of Environmental Quality (MDEQ) that the treatment cells are leaking excessively

and are not retaining water long enough to provide adequate treatment. This means untreated wastewater is leaking to groundwater. Field observations and aerial photos show that raw wastewater has regularly been directed to a storage cell which is also not retaining the wastewater long enough for proper treatment due to excessive leaking; so untreated wastewater is leaking to groundwater from the storage cell as well. The third and fourth storage cells were never fully completed and appear to have never received wastewater. It is estimated that most of the 30 million gallons of wastewater generated yearly in the Subdivision is leaking from the cells before it is properly treated. This discharge is most likely contaminating the groundwater, and may be impacting downstream water users. Approximately one foot of sludge is estimated to have accumulated in the bottom of the two operating cells since the system was placed into operation.

The collection system pipe in the Subdivisions was recently inspected using closed circuit television (CCTV) by the City of Helena under a contract to Lewis and Clark County and found to be in fair condition. However, some mains were found to be in poor condition, especially in the Pleasant Valley subdivision where cracked pipe, inadequately sloped pipe, and sagging sections were found. Some pipe showed signs of age, poor construction methods, and gravel and debris were also found. These poor pipe conditions have likely been the primarily cause of numerous sewer main and service line backups which have been reported to have occurred into homes and some resulted in overflows from manholes which surfaced to the ground. Another cause of some backups into homes is because some sewer mains, especially the sewer main in Kelly Road, were installed at such a shallow elevation that some sewer services do not drain well. The backups may also indicate that the collection system experiences high level of inflow during storm and flood events. Additionally, because of the high groundwater in the area, homes with basements may be using sump pumps to control the water levels, and these sump pumps may be discharging to the sewer system and may be increasing the flows significantly in the wastewater system. This outfall sewer main and the collection sewer main in Kelly Road may have been installed at a shallow depth to allow gravity feed to the treatment lagoons. Sewer backups into homes and surface overflows from manholes are a health hazard that the Ten Mile Estates County Sewer District (District) wishes to eliminate with this project.

Based on the above reasons, the entire existing wastewater treatment system and the collection pipe in Kelly Road and some portions in the adjacent streets have been recommended for replacement. Replacement of the collection pipe to a lower elevation will allow the connecting services to be reinstalled at a steeper slope, reducing the potential for sewer backups. However, lowering the collection pipe elevation will require that a new lift station be constructed. The new lift station will be located at the east end of Kelly Road. A force main pipe from the new lift station to the new treatment cells will also be required and will be installed in Monger Road. The existing outfall main will be used as an overflow pipe. All accumulated sludge in the bottom of the cells will be dewatered (if necessary) and hauled to a local agriculture field for disposal (land application). The Environmental Protection Agency (EPA) regulates the removal, treatment and disposal of wastewater sludge in Montana. A nearby landowner has been contacted and expressed interest in accepting the sludge. The proposed replacement system will be a total retention system so the District can continue operation without a discharge permit.

Costs for the proposed improvements are estimated to be $5,630,000. The District obtained two federal grants; one from the U.S. Army Corps of Engineers (Water Resources Development Act) for $178,000 and one from the State and Tribal Assistance Grants (STAG) for $329,000, which is being administrated by Lewis and Clark County. The District will also use a $250,000 grant from the Renewable Resources Grant and Loan Program (Department

of Natural Resources and Conservation). This District will pay approximately $31,000 in direct costs and two low interest loans (3%) for 30 years, currently estimated at $1,738,000 for Phase 1 and 2 and $3,104,000 for Phase 3, from the Montana Water Pollution Control State Revolving Fund will be obtained to complete the funding requirements. The total cost of Phase 1 and 2 is currently estimated at $2,526,000 and Phase 3 is currently estimated at $3,104,000.

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 projects. Additional environmental impacts related to land use, water quality, air quality, public health, energy, noise, and growth 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.

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

D. COMMENT PERIOD

Thirty (30) calendar days

II. PURPOSE OF AND NEED FOR ACTION

The August 2008 Preliminary Engineering Report (PER), December 2012 PER Update for the Ten Mile/Pleasant Valley Wastewater Subdivisions, and PER Amendment July 2013, prepared by Great West Engineering, Inc., have identified the need to replace the existing wastewater treatment facility and repair approximately 4,000 feet of the gravity sewer collection pipe. Although improvements for the entire wastewater system are needed immediately, the improvements will be split into three phases. This allows time for the District to obtain wastewater flow data to design the new treatment system. The first phase of improvements was completed in the spring of 2013 and included numerous spot repairs to the collection system to reduce the amount of inflow/infiltration. The Phase 2 improvements will be completed during the fall of 2013 and will include improvements to the collection system, a new lift station, and a new force main. A liner will be installed in an irrigation canal adjacent to the Pleasant Valley Subdivision to reduce the groundwater level within the subdivision. The Phase 3 improvements, scheduled to begin construction in the spring of 2015, will consist of upgrading the existing wastewater treatment system.

The Ten Mile Estates and Pleasant Valley Subdivisions (Subdivisions) are located about two miles north of Helena, Montana, in Lewis and Clark County. The Subdivisions include approximately 806 residents on 310 services. Constructed in 1978, the total retention wastewater treatment system was designed and approved to include two aerated treatment cells and three storage cells for 314 homes. The two treatment cells were to be lined with a PVC liner and the three storage cells were to be lined with a natural clay and bentonite soil liner to prevent treated water from rapidly percolating into the ground. However, only one treatment cell and one storage cell were lined and the third and fourth storage cells were never fully completed. The aeration system was never been installed in either treatment cell.

It has been demonstrated by Great West Engineering, Inc. (GWE) and the Montana Department of Environmental Quality (MDEQ) that the treatment cells are leaking excessively and are not retaining water long enough to provide adequate treatment. This means untreated wastewater is leaking to groundwater. Field observations and aerial photos show that raw wastewater has regularly been directed to a storage cell which is also not retaining the wastewater long enough for proper treatment due to excessive leaking; so untreated wastewater is leaking to groundwater from the storage cell as well. The third and fourth storage cells were never fully completed and appear to have never received wastewater. It is estimated that most of the 30 million gallons of wastewater generated yearly in the Subdivision is leaking from the cells before it is properly treated. This discharge is most likely contaminating the groundwater, and may be impacting downstream water users. Approximately one foot of sludge is estimated to have accumulated in the bottom of the two operating cells since the system was placed into operation.

The collection system pipe in the Subdivisions was recently inspected using closed circuit television (CCTV) by the City of Helena under a contract to Lewis and Clark County and found to be in fair condition. However, some mains were found to be in poor condition, especially in the Pleasant Valley subdivision where cracked pipe, inadequately sloped pipe, and sagging sections were found. Some pipe showed signs of age, poor construction methods, and gravel and debris were also found. These poor pipe conditions have likely been the primarily cause of numerous sewer main and service line backups which have been reported to have occurred into homes and some resulted in overflows from manholes which surfaced to the ground. Another cause of some backups into homes is because some sewer mains, especially the sewer main in Kelly Road, were installed at such a shallow elevation that some sewer services do not drain well. The backups may also indicate that the collection system experiences high level of inflow during storm and flood events. Additionally, because of the high groundwater in the area, homes with basements may be using sump pumps to control the water levels, and these sump pumps may be discharging to the sewer system and may be increasing the flows significantly in the wastewater system. This outfall sewer main and the collection sewer main in Kelly Road may have been installed at a shallow depth to allow gravity feed to the treatment lagoons. Sewer backups into homes and surface overflows from manholes are a health hazard that the Ten Mile Estates County Sewer District (District) wishes to eliminate with this project.

III. ALTERNATIVES INCLUDING THE PROPOSED ACTION AND COSTS

Including a no action alternative, six alternatives for replacement of the existing wastewater treatment facility and three alternatives for replacement of portions of the collection system piping were evaluated in the PERs.

A. Wastewater Treatment System Alternatives

1. Alternative T-1 - No Action: The no action alternative would allow untreated wastewater to continue leaking into the groundwater. If the District continued to use the existing treatment system without making improvements there could be potential for public health risks, environmental damage from the untreated wastewater, and significant fines and penalties from DEQ would occur. Based on these concerns, the no-action alternative was not considered to be a viable option.

2. Alternative T-2 - Total Retention System: The total retention wastewater treatment system concept evaluated in the PER was similar to the treatment system originally designed for the Subdivision in 1978. However, this alternative does not propose aerating the treatment

cells. This alternative would essentially rehabilitate the existing treatment system to meet current DEQ standards. Current design standards for total retention systems must be designed and constructed to allow less leakage to groundwater than allowed in 1978. Design standards include that more stringent precipitation and evaporation rates be considered in the design. Based on a May 2006 wastewater flow monitoring study by Morrison-Maierle, Inc. (MMI) a total retention system designed to current standards would require a treatment cell approximately 5 acres in size and a storage/evaporation cell that is approximately 24 acres in size (see Figure 3). Current actual wastewater flows may be higher than the monitoring study indicated during the late spring and summer due to infiltration of groundwater (into the collection system) and water being pumped into the collection system from basements. This water is expected to be removed through improvements proposed in Phases 1 and 2, but actual flows will not be available until the summer of 2014. Once the actual wastewater flows are known, the treatment and storage cells will be sized to meet current DEQ standards. The District expects the actual flow to be less than the MMI study indicated, therefore the cell sizes could change. The total retention system would have the lowest operating costs of the treatment systems evaluated and would be the simplest to operate and maintain because there would be no mechanical equipment. Depending on actual flows, this system can be constructed within the existing site and therefore no additional property may be required. However, of the alternatives evaluated, this system would require the largest area because of the surface area required for evaporation. A total retention system could continue to operate without a discharge permit. The sludge accumulated in the cells would be land applied at agronomic rates to local agricultural fields. This alternative was considered to be a viable option and was the recommended alternative in the PER Update.

3. Alternative T-3 - Facultative Treatment with Spray Irrigation: The facultative treatment with spray irrigation system alternative included a treatment cell, a storage cell, and a spray irrigation site. The treatment cell and storage cell could be constructed within the existing site, but an off-site area would be required for the spray irrigation site. To treat the wastewater from the Ten Mile/Pleasant Valley subdivisions, this alternative included a synthetically lined treatment cell with a surface area of approximately 5 acres. Treated wastewater would be stored during the winter months in a synthetically lined cell and pumped to the spray irrigation site during the growing season for disposal. The surface area of the storage cell would be approximately 6 acres (see Figure 4). Approximately 50 acres of off-site area would be purchased or leased to apply the treated wastewater at agronomic rates. If the treated wastewater is not disinfected prior to disposal, the spray irrigation site would include a 200-foot wide buffer along the site boundary. In addition to the potential capital cost of the spray irrigation site and the spray irrigation system, the spray irrigation system would require more operation and maintenance (costs), making this alternative a higher cost than the total retention alternative. Reuse of the treated wastewater and that no discharge permit is required are benefits of this alternative. The sludge accumulated in the cells would be land applied at agronomic rates to local agricultural fields. Due to the large area required for spray irrigation site and the additional operation and maintenance over the total retention system, this alternative was not recommended for the Ten Mile/Pleasant Valley subdivisions.

4. Alternative T-4 - Aerated Treatment with Spray Irrigation: The aerated treatment with spray irrigation system alternative included an aerated cell, a storage cell, and a spray irrigation site. To treat the wastewater from the Ten Mile/Pleasant Valley subdivisions, this alternative included a synthetically lined aerated treatment cell with a surface area of approximately 0.7 acres. Treated wastewater would be stored during the winter months in

a synthetically lined cell and pumped to the spray irrigation site during the growing season for disposal. The treatment cell and storage cell could be constructed within the existing site, but an off-site area would be required for the spray irrigation site. The surface area of the storage cell would be approximately 7 acres (see Figure 5). Approximately 50 acres of off-site area would be purchased or leased to apply the treated wastewater (at agronomic rates). If the treated wastewater is not disinfected prior to disposal, the spray irrigation site would include a 200-foot wide buffer along the site boundary. In addition to the potential capital cost of the spray irrigation site and the spray irrigation system, the spray irrigation system would require more operation and maintenance than the total retention alternative. Reuse of the treated wastewater and because a discharge permit is not required are benefits of this alternative. The sludge accumulated in the cells would be land applied at agronomic rates to local agricultural fields. Due to the large area required for spray irrigation site and the additional operation and maintenance over the total retention system, this alternative was not recommended for the Ten Mile/Pleasant Valley subdivisions.

5. Alternative T-5 - Mechanical Treatment with Subsurface Disposal: The mechanical treatment facility with groundwater disposal alternative included a sequencing batch reactor (SBR), ultraviolet (UV) disinfection system, and infiltration chambers (see Figure 6). Because of the groundwater disposal component of this alternative, a groundwater discharge permit would be required to be obtained from Department of Environmental Quality. However, a discharge permit would include several water quality requirements, including: the treated wastewater must be disinfected prior to discharge (to groundwater), the total nitrogen concentration be less than 7.5mg/L, and the phosphorous breakthrough must be greater than 50 years (nondegradation criteria). This high level of treatment could be obtained from a SBR facility. Moreover, an SBR facility requires a small space to construct and would allow easy expansion (growth) in the future (if the District desired too). Due to the complex operation of the SRB and disinfection systems, a full time wastewater operator would be required. Moreover, of the alternatives considered, this alternative would be the highest cost to construct, operate and maintain. The discharge permit requirements would subject this treatment system to more treatment regulations than the other alternatives considered. Based on these issues, this alternative was not recommended for the Ten Mile/Pleasant Valley subdivisions.

6. Alternative T-6 - Connect to City of Helena: Connecting the Ten Mile/Pleasant Valley subdivisions sewer to the City of Helena would require constructing a lift station and a forcemain to pump the wastewater approximately 11,000 feet to the city wastewater treatment facility. The lift station would be located northeast side of the Pleasant Valley subdivision and would have a pumping capacity of approximately 180 gallons per minute. The forcemain would be located in the public right-of-way as much as possible (see Figure 7). Of the alternatives considered, this alternative had the lowest capital cost, and would require no future operation and maintenance from the District. There would be potential to develop the approximately twenty-five acres of land currently used by the existing treatment system. There would not be a discharge permit required for this alternative. The City would charge a service development fee per hookup for each service. Connecting to the City was the recommended alternative in the 2008 PER and the District pursued connecting to the City. However, the city's Final Growth Policy Plan, included Ten Mile Estates subdivision, but did not include the Pleasant Valley subdivision. The City had concerns with providing law enforcement, transportation and fire protection service to the area east of Interstate 15 (Pleasant Valley subdivision) and this rendered connecting to the City of Helena unfeasible.

B. Collection System Alternatives

1. Alternative LS-1 - No build: The no action alternative would not repair pipe known to be in poor condition or replace sewer main and services constructed too shallow and/or too flat to adequately convey raw wastewater. The sewer services, most likely constructed with minimal slope, do not flow properly from the home to the sewer main, and cracked pipe, inadequately sloped pipe, and sagging sections of pipe were found during the camera inspections. These conditions promote the backup of sewage into homes and surface overflows from manholes. Services in the eastern part of Pleasant Valley subdivision were noted as the most prone to backups. If the District makes no improvements to the sewer mains, the backups could be potential public health risks and the poor pipe conditions will continue to be an operation, maintenance, and liability for the District. Based on these concerns, the no-action alternative was not considered to be a viable option.

2. Alternative LS-2 - Replace Sewer Main in Kelly Road: To improve the flow of sewage in the existing sewer mains and services, this alternative recommends that approximately 4,000 feet of 8 and 10-inch gravity sewer main and approximately 1,600 feet of sewer service pipe (approximately 60 sewer services in Pleasant Valley subdivision) be replaced. Some sewer main will be replaced because the existing pipe is in poor structural condition (cracked pipe, inadequately sloped pipe, and sagging sections), but most of the pipe will be constructed to a lower elevation to provide the proper slope for drainage, including portions of the connecting services. This will reduce the potential for sewer backup and surface overflows, and the costs associated with cleaning and maintaining the collection system. However, lowering the sewer mains will require the construction of a lift station and force main to convey the wastewater to the treatment facility (see Figure 8). In addition to the capital cost of the lift station and force main, the new lift station will increase the District's operation and maintenance cost over the gravity system. The existing outfall main will be used as an overflow pipe during very high flows (greater than about 520 gpm) to the lift station. The District and their engineer are evaluating methods to eliminate the basement sump pumps from the sewer system. Connecting the sump pumps to the existing street storm drain system and extending the storm drain system are being considered. This alternative was considered to be a viable option and was the recommended alternative in the PER Update.

3. Alternative LS-3 - Replace Gravity Services with Grinder Pumps: Approximately 60 sewer services in the eastern part of Pleasant Valley subdivision were installed with insufficient slope for wastewater to drain properly to the sewer main. Instead of replacing the sewer main in several streets (approximately 4,000 feet of 8 and 10-inch gravity sewer main), the homes with the poor services would receive individual pumps and forcemains to convey the wastewater to the sewer main. This alternative recommended using the existing sewer outfall pipe. A new pump and force main service would replace the existing gravity sewer service, which should eliminate sewer backups into the homes. However, the new services would probably not eliminate sewer overflows from manholes. Based on this concern, this alternative was not considered to be a viable option.

C. COST COMPARISON - PRESENT WORTH ANALYSIS

Costs for the proposed improvements are estimated to be $5,634,000. The District obtained two federal grants; one from the U.S. Army Corps of Engineers (Water Resources Development Act) for $178,000 and one from the State and Tribal Assistance Grants (STAG) for $329,000, which is being administrated by Lewis and Clark County. The District will also

use a $250,000 grant from the Renewable Resources Grant and Loan Program (Department of Natural Resources and Conservation). This District will pay approximately $31,000 in direct costs and two low interest loans (3%) for 30 years, currently estimated at $1,738,000 for Phase II and $3,104,000 for Phase III, from the Montana Water Pollution Control State Revolving Fund will be obtained to complete the funding requirements. The total cost of Phase I is currently estimated at $2,526,000 and Phase II is currently estimated at $3,104,000.

The financial impact of this project on the system users is shown in Table 1. Based on the EPA guidance for project affordability, the proposed project will result in a monthly cost per household that is 1.89% of the monthly median household income, and therefore, may impose a slight to moderate economic hardship on household income.

TABLE 1
PROJECT AFFORDABILITY

Monthly sewer rate[1]	$83.50
Monthly median household income (mMHI)[2]	$4,421
User rate as a percentage of mMHI	1.89 %

[1] Update to January 7, 2013 Uniform Application for Montana Public Facility Projects
[2] Based on 2007-2011 US Dept. of Commerce US Census Bureau data for Lewis and Clark County

The present worth analysis is a means of comparing alternatives in present day dollars and can be used to determine the most cost-effective alternative(s). An alternative with low initial capital cost may not be the most cost efficient project if high operation and maintenance costs occur over the life of the alternative. An interest rate of 6.0% over the 20-year planning period (design years 2012 to 2042) was used in the analysis. Table 2 provides a summary of the present worth analysis of the feasible treatment alternatives considered.

TABLE 2
ALTERNATIVE COST COMPARISON

Alternative (From Above)	Capital Costs (million) *	Annual O&M Cost *	20 Year Salvage Value *	Present Worth Annual O&M *	O&M Present Worth (million) *	Total Present Worth (million) *
Treatment Alternatives						
T-2 Total Retention	$3.231	$1,400	$468,075	$145,900	$0.020	$3.105
T-3 Facultative Treatment with Spray Irrigation	$2.822	$23,920	$1,128,000	$351,700	$0.274	$2.744
T-4 Aerated Treatment with Spray Irrigation	$3.416	$61,180	$1,213,000	$701,700	$0.702	$3.739
T-5 Mechanical Treatment with Subsurface Disposal	$3.281	$182,800	$822,100	$256,300	$2.1	$5.120
T-6 Connect to City of Helena	$1.640	$64,152	$364,000	$113,500	$0.74	$2.262
Collection Alternatives						
LS-2 Lift Station, Force Main and Gravity Sewer Main Replacement	$1.888	$15,100	$309,800	$96,500	$219,545	$2.011

LS-3 Replace Gravity Services With Grinder Pumps	$1.234	$5,300	$92,400	$28,800	$77,059	$1.283

* Alternative T-2, LS-2 and LS-3 are in 2013 dollars, other alternatives are in 2008 dollars.

D. BASIS OF SELECTION OF PREFERED ALTERNATIVES

Selection of the preferred alternative was based upon several criteria, both monetary and non-monetary. The ranking criteria considered are shown in Table 3. Each alternative was assigned a rating of plus (+), minus (-), or neutral (0) for each category, with plus being the most favorable and minus being the least favorable. The ratings were then summed, resulting in a total score, the greatest score indicating the highest rating. As shown in the rating matrix, Alternative T-6 (Connect to City of Helena) rated the highest, primarily due to the cost effectiveness, ability to expand, land requirements, and environmental advantages. However, due to the inability to connect to the city, this alternative could not be used. Therefore, Alternative T-2, the Total Retention System was recommended in the Updated PER and is proposed as Phase 3 of the improvements to the wastewater system. Phase 3 improvements are proposed to be constructed in the summer of 2014 and 2015. See Figure 3.

TABLE 3
RANKING CRITERIA FOR TREATMENT ALTERNATIVES

Comparison	Alternative T-2 Total Retention	Alternative T-3 Facultative Treatment with Spray Irrigation	Alternative T-4 Aerated Treatment with Spray Irrigation	Alternative T-5 Mechanical Treatment with Subsurface Disposal	Alternative T-6 Connect to City of Helena
Cost Effectiveness	0	0	-	-	+
Operational Complexity	+	0	0	-	0
Growth/Expandability	0	0	0	+	+
Treatment Performance	+	+	+	+	+
Land Acquisition/Legal Issues	0	-	-	0	+
Aesthetics/Social Public Acceptance	+	0	-	-	0
Environmental	+	+	+	+	+
Land Area	0	0	0	+	+
WEIGHTED SCORE TOTAL	**4**	**1**	**-1**	**1**	**6**

Selection of Alternative LS-2 was recommended in the Updated PER because it addressed both surface overflows and sewer service backups. Alternative LS-3 was not recommended because it would include the higher power cost and maintenance issues from the 60 grinder pumps and would only resolve sewer service backups. Alternative LS-2 is proposed in Phase 2 of the wastewater improvements and is proposed to be constructed in the summer of 2013 and spring of 2014. See Figure 8.

IV. AFFECTED ENVIRONMENT

A. STUDY AREA / MAPS

The Ten Mile Estates and Pleasant Valley subdivisions are located in Lewis and Clark County, approximately two miles north of Helena, Montana. Interstate 15 separates the two subdivisions. The location of Helena can be seen on the enclosed map in Figure 1. The subdivisions are fully developed, so zero growth is possible, however, the possibility of adding additional subdivisions in the future to the wastewater treatment system has been considered. Figure 2 shows the planning/service area for the Ten Mile Estates and Pleasant Valley subdivisions, including the location of the existing wastewater treatment cells. Figure 3 – 7 shows the five alternative treatment systems considered. Figure 8 shows the location of the Phase 2 Improvements (gravity pipe replacement, forcemain and lift station). Figure 9 shows the proposed sludge site location and sludge haul route.

B. POPULATION AND FLOW PROJECTIONS

Ten Mile Estates and Pleasant Valley subdivisions are fully developed within their current boundaries (planning area) and include 310 households. Based on the 2000 census data for the Valley West Central and Helena Valley Northeast Census Designated Places, there are 2.6 people per household in the planning area (service area), which indicates an estimated population of 806. A wastewater flow monitoring study conducted in May 2006 by Morrison-Maierle, Inc. concluded the average daily flow from the subdivisions was 85,000 gallons per day (gpd) or about 105 gpd per person. The District's engineer performed flow monitoring in the spring of 2013 and observed flow in excess of 120,000 gpd. Due to the infiltration known to exist in the subdivision collections systems, and using this flow data it may have resulted in significantly oversizing the wastewater treatment system. Therefore improvements are proposed to the collection system and irrigation canal during the summer and fall of 2013 to reduce flows into the collection system. The District's engineer is currently conducting a wastewater flow study, which will conclude late in the spring of 2014. The new collection flow data will be used to size the proposed treatment cells.

C. NATURAL FEATURES

The predominate soil in the vicinity of the Ten Mile Estates and Pleasant Valley subdivisions and the existing wastewater treatment cells is mapped as the Meadowcreek-Fairway complex (218A - Soil Map for Lewis and Clark County by the USDA National Resources Conservation Service). The Meadowcreek-Fairway complex soil generally includes an upper 3 to 4 feet of silt loam or loam over a very gravelly sand or very gravelly loamy sand. The planning area is considered to be in the Helena Valley, an intermountain valley or basin that encompasses approximately 107 square miles and is filled with a thick (over 1000 feet) accumulation of unconsolidated material. These unconsolidated soils include large yield groundwater deposits, which can be found at shallow depths. The topography of the Helena Valley gently slopes to the northeast, to Lake Helena. Property which includes the Fairway silt loam is classified as prime farmlands, if irrigated properly.

The average precipitation for the planning area is approximately 12 inches per year, making it a semi-arid environment. Summer temperatures average 68 degrees in July, and January's temperature averages 19 degrees.

V. ENVIRONMENTAL IMPACTS OF PROPOSED PROJECT

A. DIRECT AND INDIRECT IMPACTS OF PROPOSED PROJECT

1. Land Use / Prime Farmland – The Ten Mile Estates and Pleasant Valley subdivisions are fully developed with residential homes. Land use outside the planning area is dominated by agriculture uses with some residential development. All the proposed improvements will occur in previously impacted areas. With the exception of the new lift station to be constructed on an existing residential lot, and the sludge disposal, which will be applied to agriculture fields currently used for crop production, all the proposed work will occur in existing street rights of ways and the existing wastewater treatment area. The lift station construction will impact approximately 5,000 square feet of property, which is no longer classified as prime farmland. The sludge is expected to increase production of the crop on these lands and therefore will be a positive impact to the land. No adverse effects to the land use are expected due to the proposed improvements.

2. Soils Suitability, Topographic and Geologic Constraints - No soil, topography or geological constraints were found for the proposed project and based on the existing conditions and soils types, the impacts of the proposed project will have no significant effect on the soils or topography. Because the proposed utility work will replace or repair existing utility facilities, which are located on previously constructed areas, the land should no longer be classified as prime farmland. There is minimal potential for the discovery of hydrocarbon contaminated soils during the lift station, pipe or treatment facility construction. However, it is unknown until construction occurs if contaminated soils will be encountered. If contaminated soils are encountered, they will be removed and replaced with clean soils in accordance with DEQ regulations and guidance if necessary.

3. Fish and Wildlife - The Montana Natural Heritage Program (MNHP) listed the Gray Wolf, Bald Eagle, Brewer's Sparrow, Small Yellow Lady's-slipper, Bobolink, Wedge-leaved Saltbush and Lewis's Woodpecker as species of potential concern in the project area. The Montana Department of Fish, Wildlife, and Parks and the U. S. Fish and Wildlife Service reviewed the proposed project and indicated that based on their review of the proposed alternatives, they preferred Alternative 6 (connect to City of Helena) because of the long-term potential to protect water quality. The U.S. Fish and Wildlife Services was contacted regarding the proposed improvements and indicated that the proposed improvements are unlikely to have any significant adverse effects upon fish, wildlife, or habitat resources. Their comments are summarized in Section IX of this report.

4. Water Resource Issues - No significant adverse impacts to surface or groundwater will result from the proposed project. Potential impacts to groundwater will be eliminated once the project is complete because untreated wastewater will no longer leak into the groundwater. A stormwater general discharge permit and a groundwater construction dewatering permit may be needed and will be acquired, if necessary.

5. Floodplain – No actual work is proposed within the floodplain as part of the proposed project and all improvements will be outside the floodplain limits. See Section IX: Agencies Consulted of this report for a summary of their comments.

6. Wetlands – Before dredged or fill material can be discharged or placed into waters of the United States, including wetlands, a 404 permit must first be obtained from the U.S. Army

Corps of Engineers (USACE). The District's consultant performed a wetland reconnaissance of the site and observed vegetation in a ditch that may meet the criteria of wetland vegetation. The area was small (less than 0.1 acre), which does not typically require mitigation, but the area could be a jurisdictional wetland. The consultant recommended submitting a Nationwide Permit Application to the USACE for their comments. The USACE has been notified of this project due the possible wetland and asked to reply with any concerns. However, due to the small area expected to be impacted, no adverse impacts to wetlands should occur due to this project. If final design prescribes the placement of fill material in any jurisdictional wetland area, a permit may be required. See Section IX Agencies Consulted of this report for a summary of their comments.

7. Cultural Resources & Historical Sites – Since most of the proposed construction will occur within previous disturbed areas there is a low likelihood that cultural properties will be impacted. However, the State Historic Preservation Office recommended that monitoring take place during construction and should cultural materials be inadvertently discovered during construction, construction will be stopped and the State Historic Preservation Office will be contacted. See Section IX: Agencies Consulted of this report for a summary of their comments.

8. Air Quality - Short-term negative impacts on the air quality will occur from heavy equipment, dust and exhaust fumes during project construction. Proper construction practices and dust abatement measures must be specified during construction to control dust, thus minimizing this problem. No long-term air quality problems will result from this project.

9. Energy - During construction of the proposed project, additional energy will be consumed, resulting in a direct short-term increased demand on this resource. The existing wastewater collection system was entirely a gravity system, which did not require pumps to convey the wastewater to the treatment cells. However, the pumps in the proposed lift station will require energy, which will be a new demand for energy. Energy consumption will be minimized as much as possible through the use of energy efficient equipment (pumps).

10. Public Health – Public health will be protected and improved due to this project due to the elimination of sewage backups into homes, sewage overflows (to the surface) from manholes, and the wastewater will receive proper treatment prior to percolating to groundwater. In addition to protecting the residents in the subdivision from the sewage backups and overflows, the project will eliminate the related safety issues for the maintenance staff while responding to the backups and surface overflows.

11. Noise - Short-term impacts from excessive noise levels may occur during the construction activities. The construction period will be limited to normal daylight hours to avoid early morning or late evening construction related disturbances. An increase in noise level in the northeast corner of the Pleasant Valley subdivision will occur from the proposed emergency generator for the new lift station. The emergency generator will only operate during power outages and for approximately 30 minutes once a month to insure it is operating correctly. The noise impacts of construction and emergency generator will not be significant and therefore, no significant long-term impacts from noise should occur.

12. Sludge Disposal – All sludge (biosolids) will be removed from the existing cells and land

applied in accordance with Federal 40 CFR 503 sludge disposal regulations. The Part 503 regulations contain specific numerical limits and other requirements for heavy metals, pathogens, and vector attraction. Because the sludge is dry in the non-used cell, it will be removed from the cell and hauled to the disposal site as part of the Phase 2 improvements. Wet sludge will be removed from the operating cell during the Phase 3 improvements and allowed to dry on-site. After drying, it will be hauled to the disposal site. Covered end dump or belly dump trucks are typically used to haul dry sludge. The District has identified a potential disposal site north of Lake Helena (see Figure 9). The final sludge disposal plan must be submitted to the EPA and DEQ for review and approval.

13. 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.

14. Growth - No significant growth is expected as a result of the project because the planning area is fully developed.

15. Cumulative Effects – Upgrading the treatment facility, constructing the lift station and forcemain, replacing the pipe, and land applying the sludge is not expected to result in any secondary and cumulative impacts. No growth can occur because the planning area is fully developed.

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

B. UNAVOIDABLE ADVERSE IMPACTS

Short-term construction related impacts, such as noise, dust and traffic disruption, will occur but should be minimized through proper construction management. Energy consumption during construction cannot be avoided.

VI. AGENCY ACTION, APPLICABLE REGULATIONS, AND PERMITTING AUTHORITIES

No additional permits will be required from the State Revolving Fund (SRF) section of the DEQ for this project after the review of the submitted plans and specifications. However, coverage under the storm water general discharge permit and groundwater dewatering discharge permit, 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 the Department of Environment Quality may be required for the pipe replacement work and will be obtained.

All appropriate easements and permits for construction and maintenance (access will be addressed by the District prior to beginning construction.

VII. PUBLIC PARTICIPATION

A properly advertised public meeting was held on June 27, 2013. Approximately forty people

from the general public attended the meeting. Several asked questions about the project. Generally, the people are in support it of the project and understand the need for the wastewater treatment system upgrade.

VIII. 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. Preliminary Engineering Report for Wastewater System Improvements for the Ten Mile/Pleasant Valley Sewer District, prepared by Great West Engineering, Inc., Helena, Montana, August 2008.
2. Preliminary Engineering Report Update, for Ten Mile/Pleasant Valley Sewer District, prepared by Great West Engineering, Inc., Helena, Montana, December 2012.
3. Preliminary Engineering Report Update, for Ten Mile/Pleasant Valley Sewer District, prepared by Great West Engineering, Inc., Helena, Montana, July 2013.
4. Uniform Application Form for Montana Public Facility Projects for the Ten Mile Estates County Sewer District, January 7, 2013 and Update July 2013.

IX. AGENCIES CONSULTED

The following agencies have been contacted in regard to the PER, which determined the basis for the proposed lift station replacement project:

1. The Montana Department of Fish Wildlife and Parks (FWP) was asked in a letter by the project consultant for comments on the proposed project. The FWP did not have specific comments on the project and no concerns about impacts to fisheries habitat or wildlife.

2. The U. S. Fish and Wildlife Service (FWS) was asked in a letter by the project consultant for comments on the proposed project. The FWS indicated that it was unlikely to be any significant adverse effects to fish, wildlife, and habitat resources under the purview of the FWP.

3. The Montana State Historic Preservation Office (SHPO) considered the impacts of the proposed project on historical sites and determined there is a low likelihood cultural properties will be impacted. 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 (USACOE) was asked in a letter (date July 2, 2013) by the project consultant for comments on the proposed project. The USACOE has not responded to the letter.

5. Department of Natural Resources and Conservation (DNRC) was asked in a letter (date July 2, 2013) by the project consultant for comments on the proposed project. The DNRC has not responded to the letter.

Recommendation for Further Environmental Analysis:

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

Rationale for Recommendation: Through the Preliminary Engineering Reports (PER), prepared by Great West Engineering, Inc., the Ten Mile/Pleasant Valley Sewer District determined that the

replacement of the existing wastewater treatment system, the replacement of several thousand feet of sewer main and services, and the construction of a lift station and forcemain will improve the environmental quality, operation and maintenance capabilities of their system. Through this EA, DEQ has verified none of the adverse impacts of the proposed Ten Mile/Pleasant Valley Wastewater System Improvement Project are significant; therefore an environmental impact statement is not required. The environmental review was conducted in accordance with the Administrative Rules of Montana (ARM) 17.4.607, 17.4.608, 17.4.609 and 17.4.610. 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 is granted.

EA Prepared By:

_____ _____

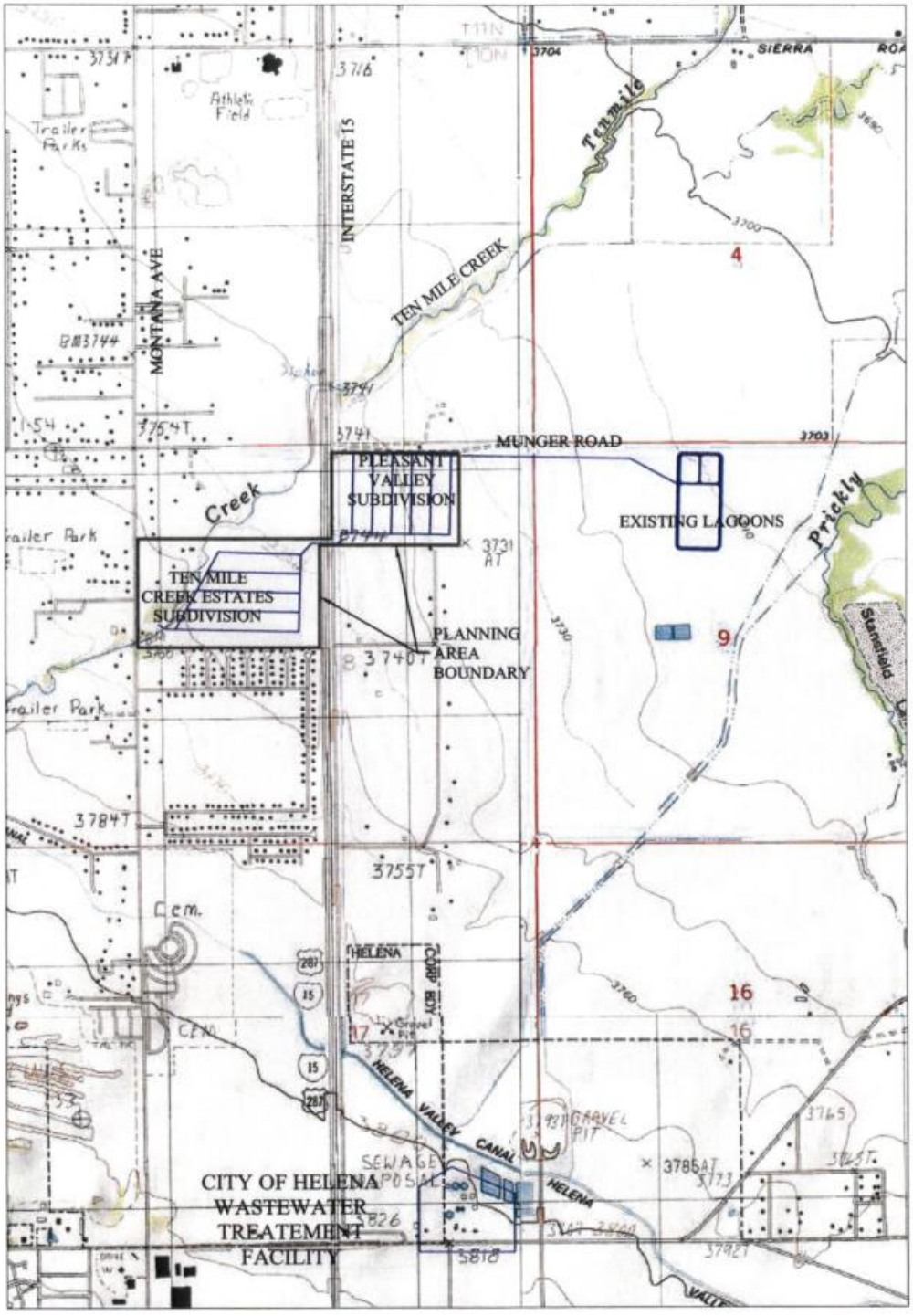
Jerry Paddock P.E. Date

Approved By:

_____ _____

Mike Abrahamson P.E. Date

FIGURE 1
LOCATION MAP



PRELIMINARY ENGINEERING REPORT
TEN MILE/PLEASANT VALLEY SUBDIVISIONS

FIGURE 2
PLANNING AREA

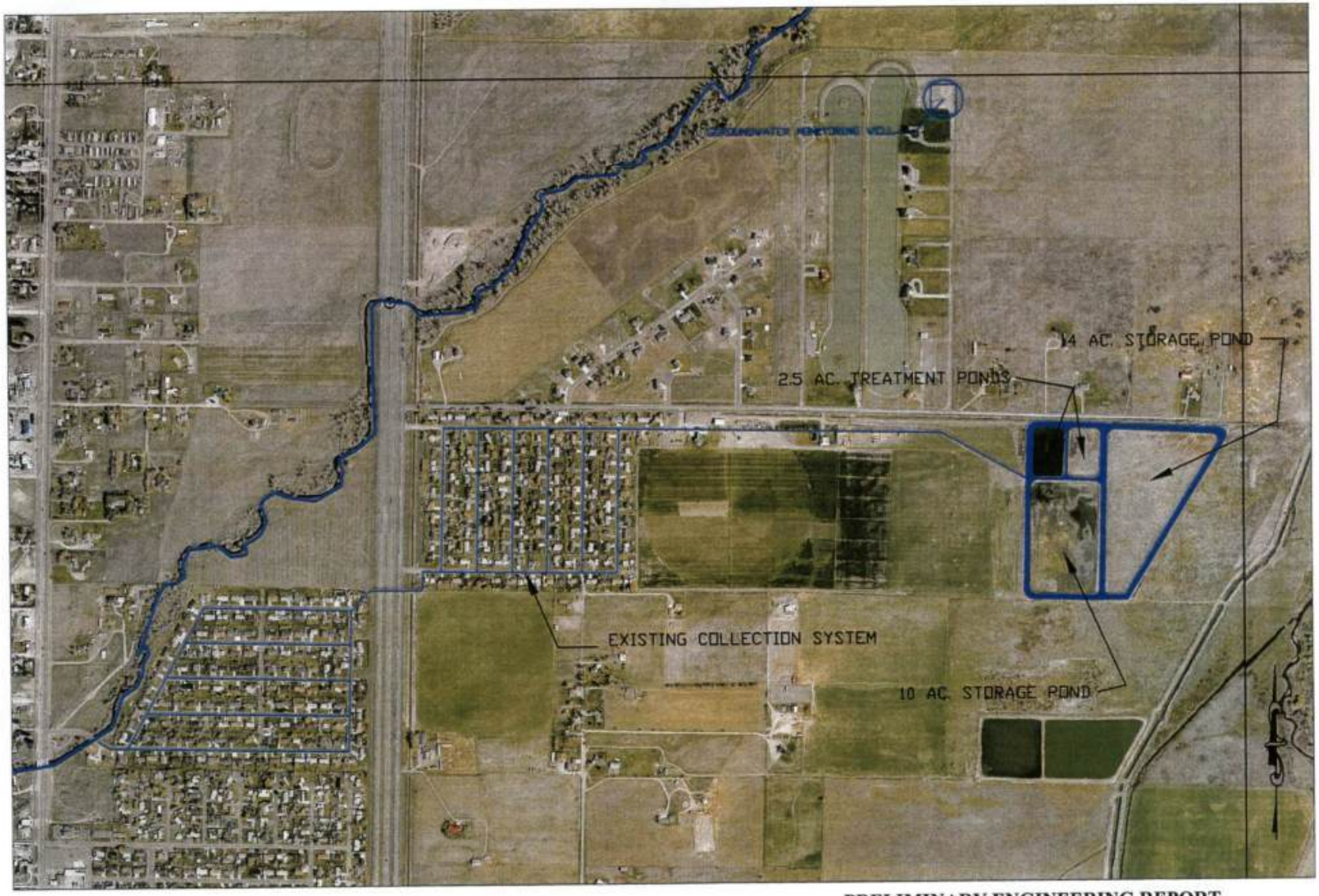


FIGURE 3 ALTERNATIVE T-2
TOTAL RETENTION SYSTEM (RECOMMENDED – PHASE 3)

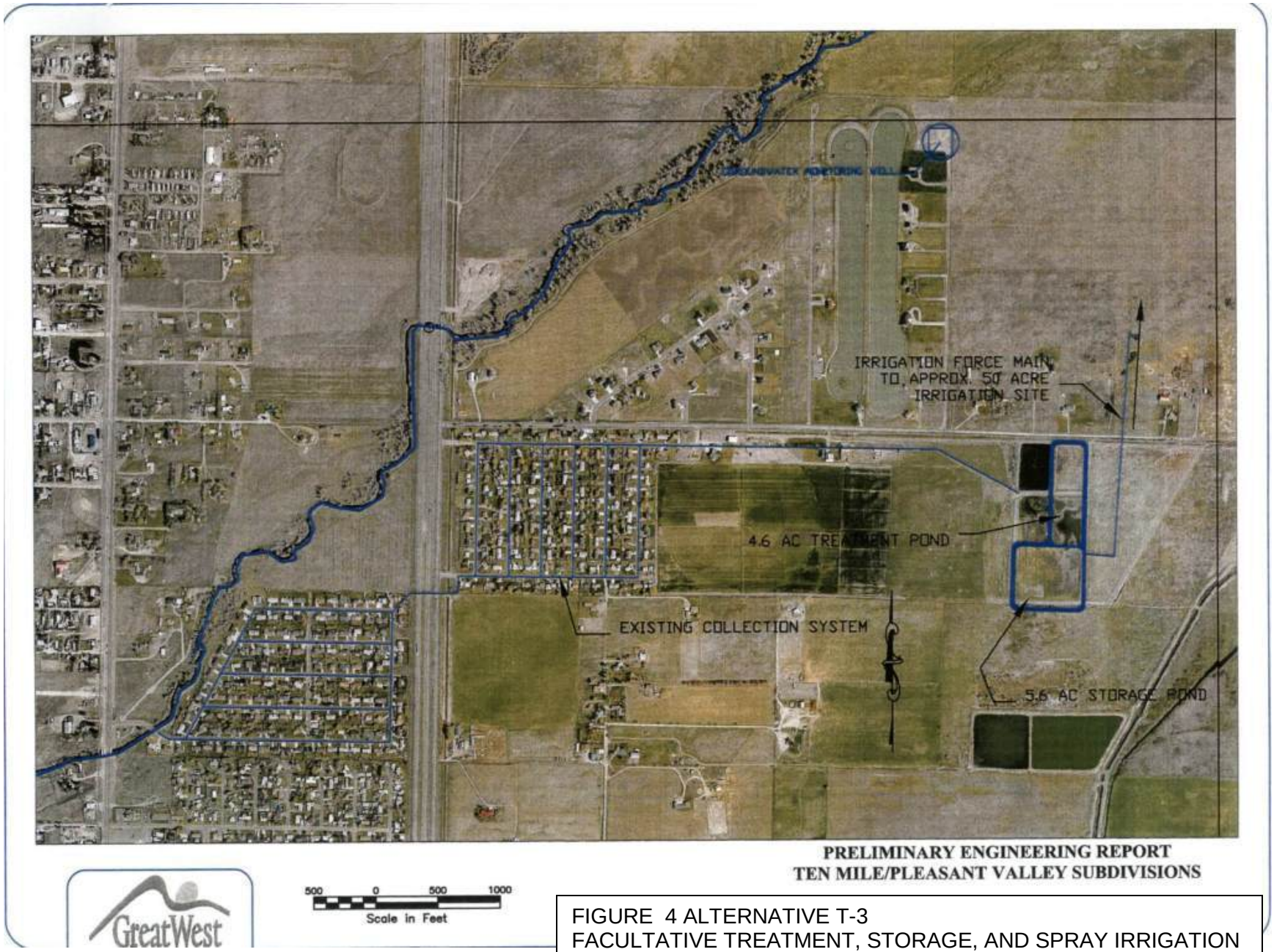


FIGURE 4 ALTERNATIVE T-3
FACULTATIVE TREATMENT, STORAGE, AND SPRAY IRRIGATION

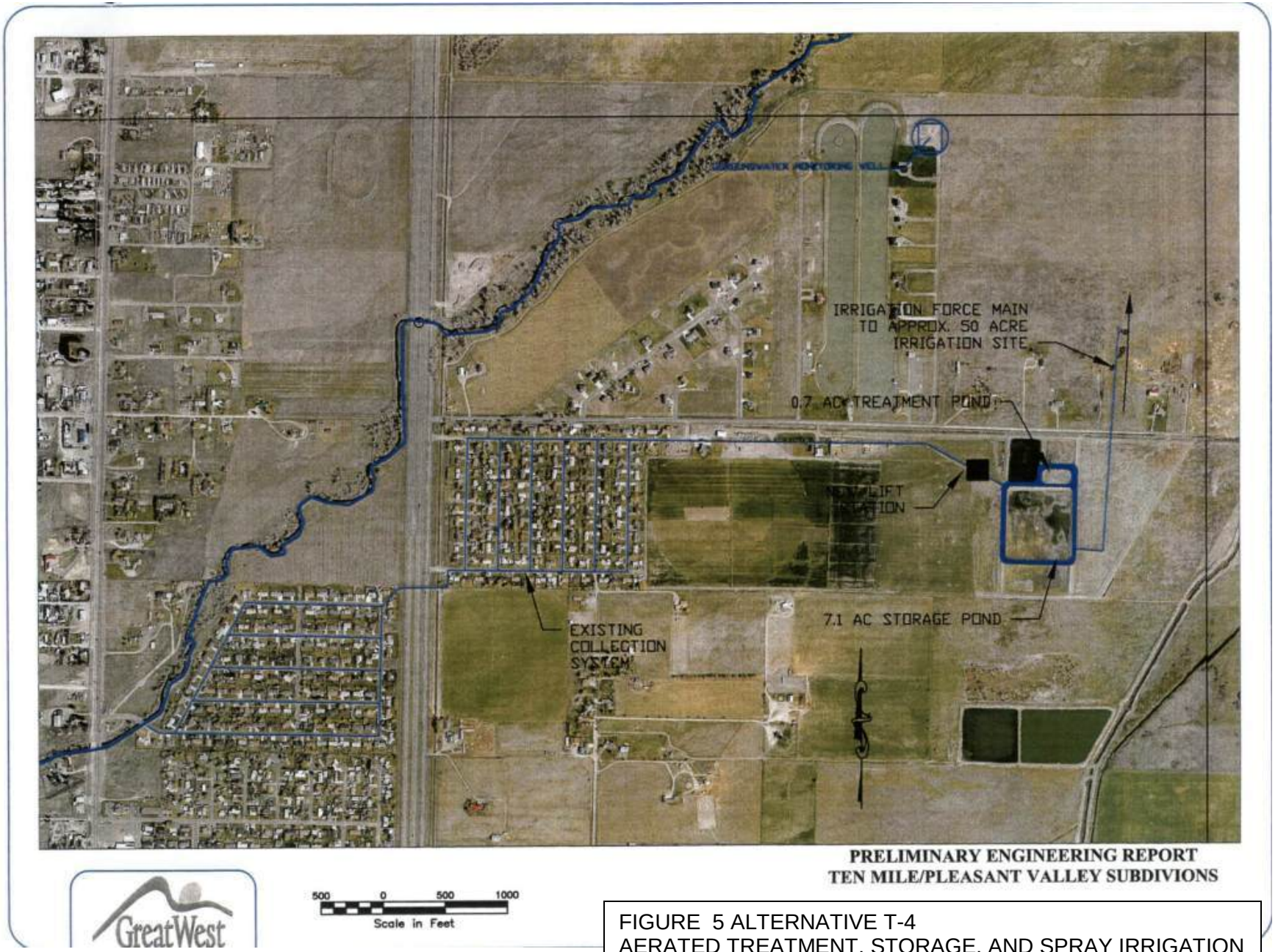


FIGURE 5 ALTERNATIVE T-4
AERATED TREATMENT, STORAGE, AND SPRAY IRRIGATION

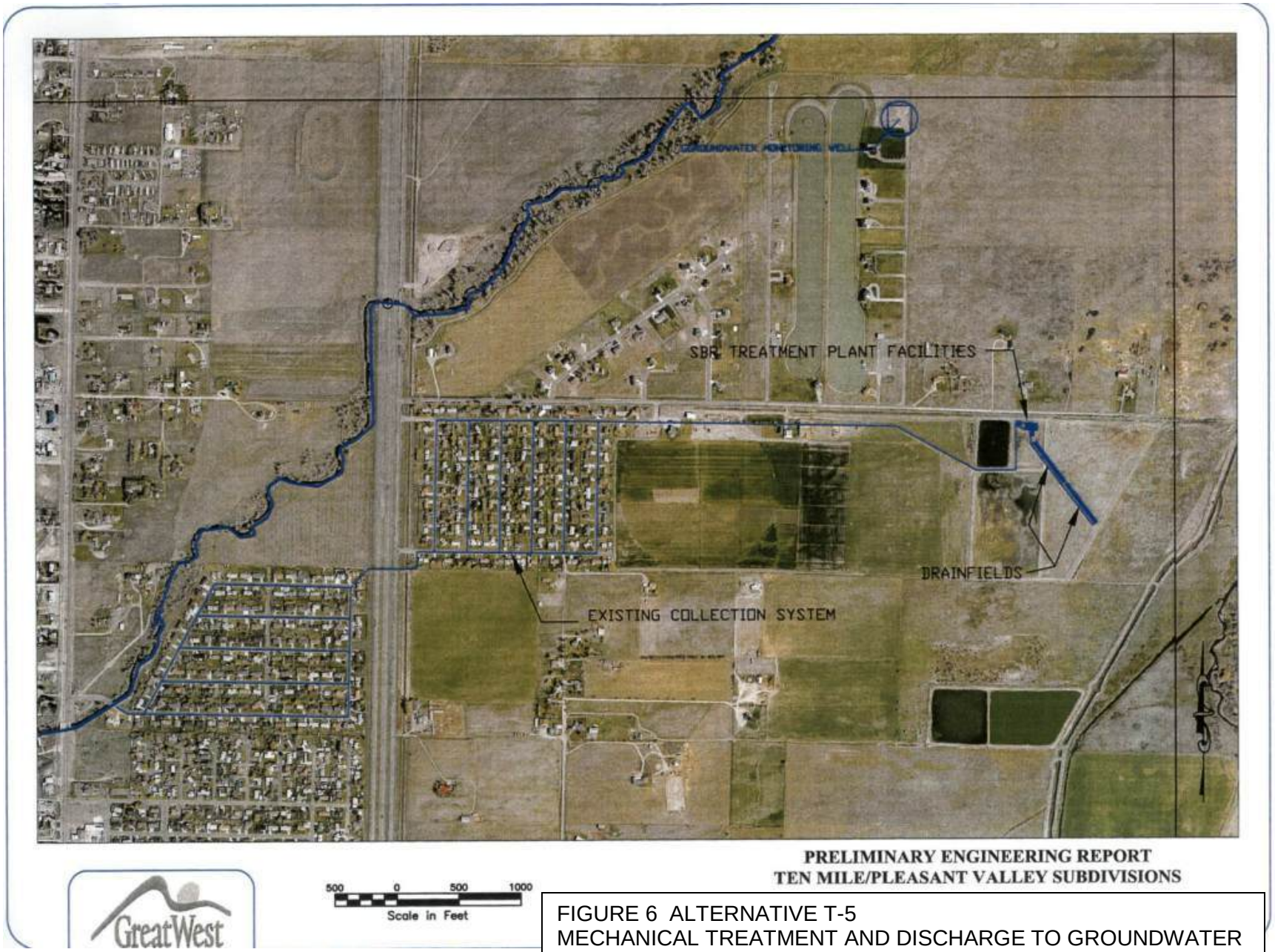
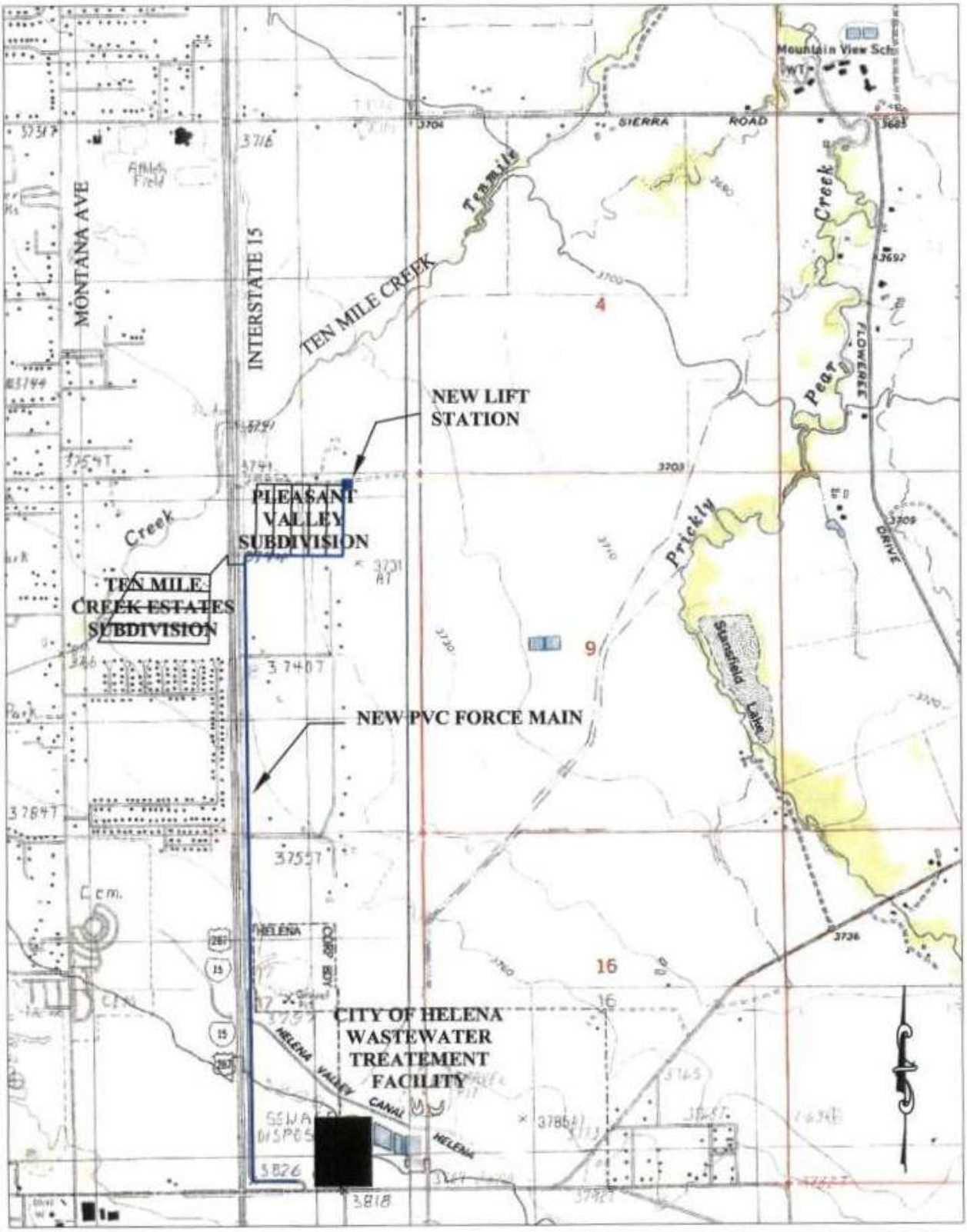
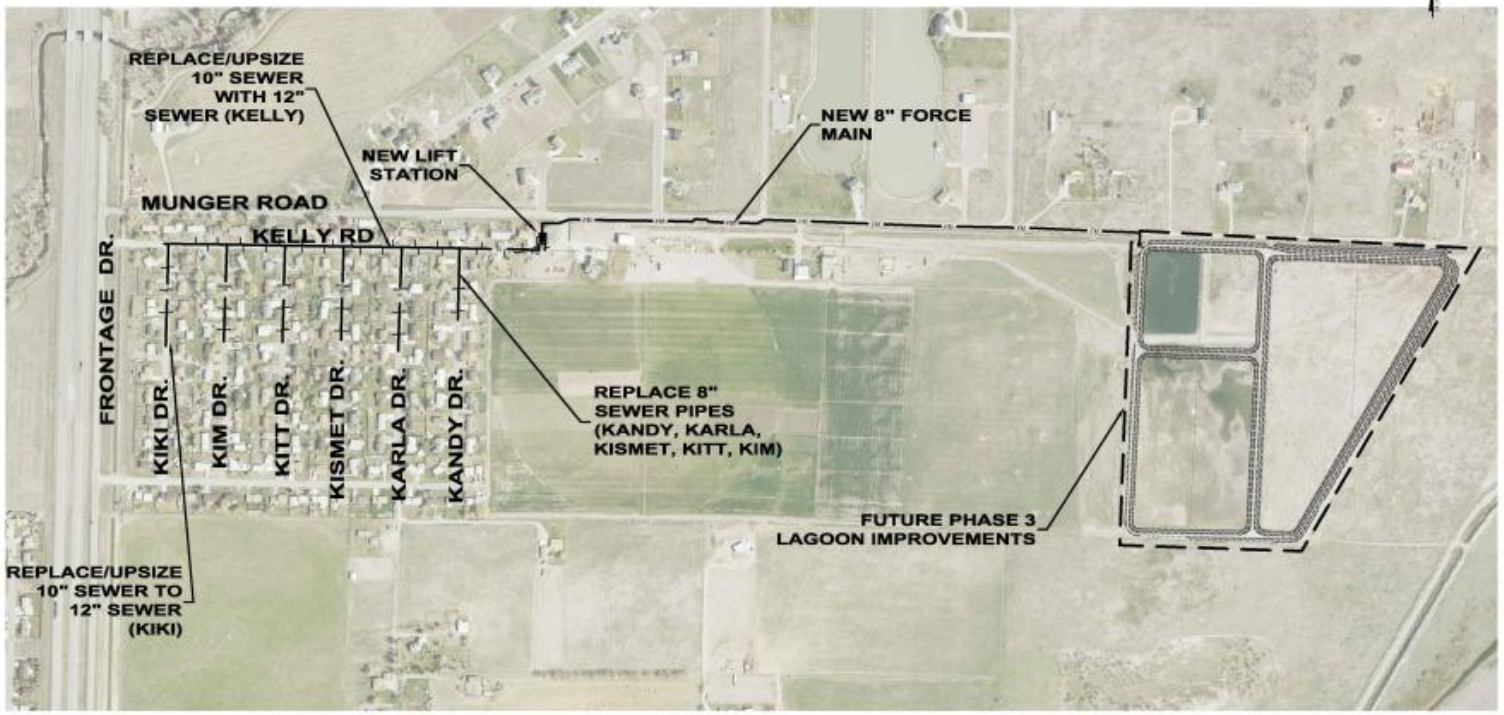


FIGURE 6 ALTERNATIVE T-5
MECHANICAL TREATMENT AND DISCHARGE TO GROUNDWATER



PRELIMINARY ENGINEERING REPORT
TEN MILE/PLEASANT VALLEY SUBDIVISIONS

FIGURE 7 ALTERNATIVE T-6
CONNECT TO CITY OF HELENA



PLAN VIEW OF PHASE 2 WASTEWATER IMPROVEMENTS

NOTE:
NEW SEWER PIPES WILL
BE INSTALLED
APPROXIMATELY 2' LOWER
THAN EXISTING MAINS.

0 250 500
SCALE IN FEET

TEN MILE ESTATES/PLEASANT VALLEY
SEWER DISTRICT

GreatWest engineering

FIGURE 8 ALTERNATIVES LS-2 and T-2
REPLACE GRAVITY MAINS, NEW LIFT STATION & FORCE MAIN (PHASE 2)
TOTAL RETENTION WASTEWATER TREATMENT IMPROVEMENTS (PHASE 3)

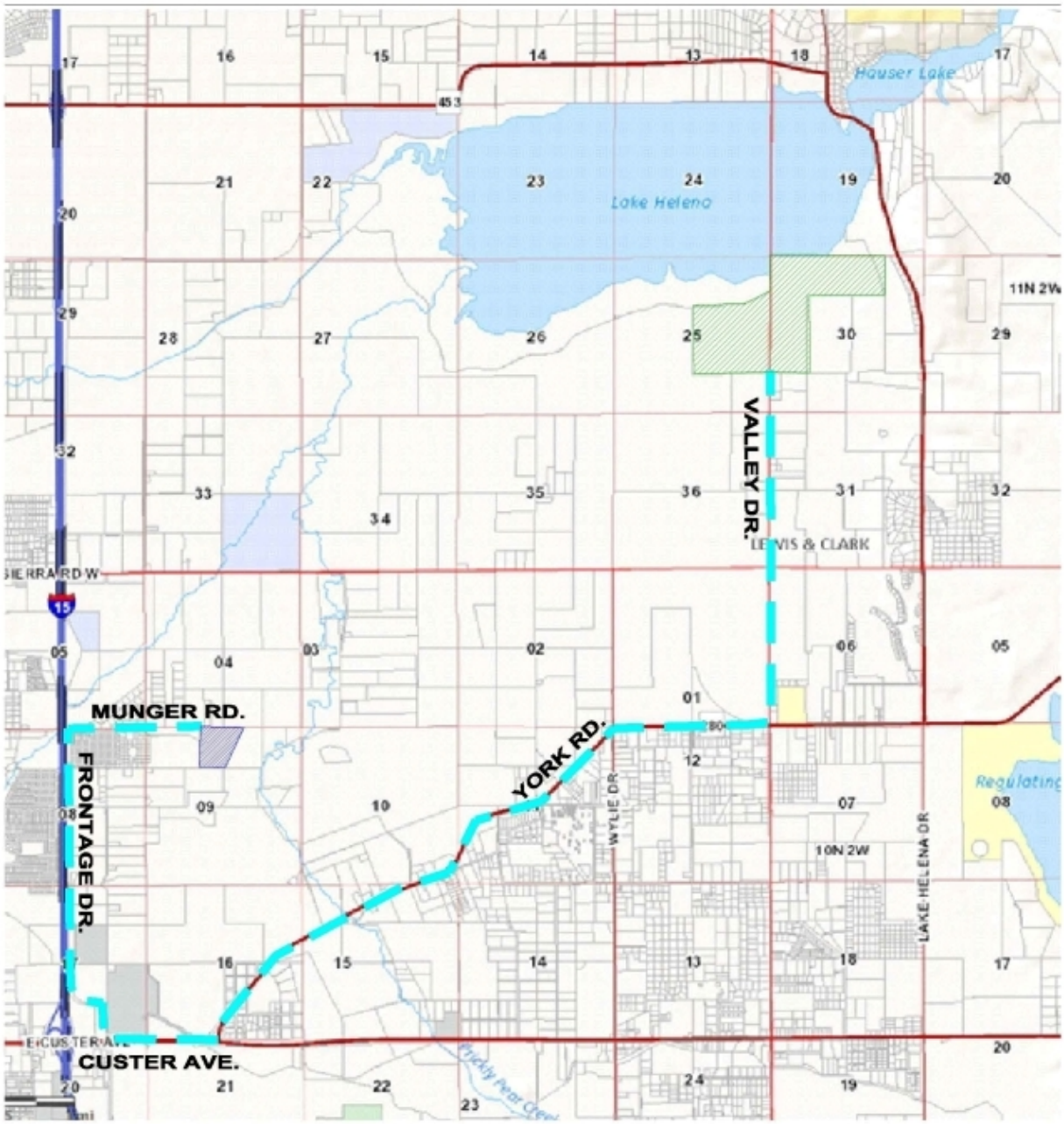


FIGURE 9
PROPOSED SLUDGE DISPOSAL SITE AND HAUL ROUTE (PHASE 2 AND PHASE 3 IMPROVEMENTS