TECHNICAL DRAFT

CITY OF TETONIA

WASTEWATER FACILITIES PLANNING STUDY

MAY 2026

DRAFT

PREPARED BY
SUNRISE ENGINEERING

CITY OF TETONIA

WASTEWATER FACILITIES PLANNING STUDY

MAY 2026

Mayor..... Brent Schindler

City Council Member..... Aaron Hansen

City Council Member ..... Mandy Rasmussen

City Council Member ..... Blaine Ball

City Council Member ..... Ryan Bonilla

Prepared for:

City of Tetonia
PO Box 57, 3192 Perry Ave
Tetonia, ID 83452
Tel: (208) 456-2249
tetoniaidaho.com

Prepared by:

Sunrise Engineering
[address redacted]
Pocatello, ID, 83201
Tel: [phone redacted]
www.sunrise-eng.com

_____

Laura-Louise Radke, P.E.
State of Idaho No. 4871550

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1. Introduction

1.1. Project Description and Need

The City of Tetonia, Idaho (the City) is located in Teton County, along Idaho State Highway 33 and is approximately 50 miles northeast of Idaho Falls, Idaho. Tetonia is situated in Teton Valley, surrounded by the Teton Mountains on the east, south and west of town. Tetonia is approximately 12 miles northwest of Grand Teton Mountain and approximately 6 miles west of the Idaho-Wyoming border. The City was established in the late 19th century and has a population of 308 (United States Census Bureau, 2020). The City offers many recreational attractions with its proximity to the Teton Mountains. The elevations in the City range from ~ 6035 ft on the northwest side, to ~6270 ft on the northeast side.

The City currently operates a lagoon treatment facility to service the citywide collection system that was originally built in the ____s. The existing lagoons contain a treat the wastewater, which is then discharged into a land application site during the summer months. The collection system consists of sewer mains with pipe sizes ranging from __ inches to __ inches in diameter. The collection system is designed to flow by gravity into a single lift station, located near the treatment site, where it gets pumped into the lagoons. From there, it gets pumped through a pump house to the land application site, where the City irrigates a pivot approximately ___ acres in size.

The last Wastewater Facility Planning Study for the City of Tetonia was prepared nearly 20 years ago. Given the significant amount of anticipated development in Tetonia and the surrounding area, the City will not be able to take on these new connections without increasing their treatment capacity. For the City to grow, an updated study is necessary to evaluate the existing system and estimate the additional number of connections the system can support. For these reasons, the City contracted with Sunrise Engineering (SE) in September of 2025 to update the planning study. This Facility Planning Study will serve as a guidance document for planning and implementing future wastewater distribution and treatment facility improvements. The study will account for a 20-year planning period for treatment and a 50-year period for collection. The purpose of this project is to:

- Provide a guidance document identifying existing system deficiencies and aid in evaluating cost-effective alternatives that address these deficiencies, minimize environmental impacts, and meet governing agency requirements.
- Provide the City with an enabling document to qualify for funding for the recommendations contained herein.

This study will be divided into five major sections:

- Existing Conditions
- Future Conditions
- Development of Alternatives

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- Final Screening of Alternatives
- Public Participation

1.2. System Owner's Responsibility

The City of Tetonia is aware of deficiencies and limitations within its wastewater collection and treatment system. The City is committed to executing projects as necessary and accepts responsibility for completing all projects according to state rules and regulations. Improvements to the wastewater system may be funded at least in part by user rates and impact fees. Additional funding from DEQ or other state or federal agencies may be required to complete the projects identified in this study. The City will obtain engineering services and a contractor with the proper qualifications to carry out the identified projects.

Due to the size of the proposed development in Tetonia and its surrounding area, a developer has committed to funding a portion of this Wastewater Facilities Planning Study. This study is a planning document to provide improvement alternatives for a growing City, in order to increase its service capabilities. Therefore, it may also require funding commitment from developers in the area, as these improvements are intended to allow for additional connections into the system.

1.3. Length of Planning Period

The planning period for this Wastewater Facilities Planning Study is 20 years, beginning in 2025 and running through 2045. The accuracy of this report is, by nature, limited by the accuracy of the included assumptions, data, and projections. Tetonia should review and update this Wastewater Facility Plan every five to ten years or as otherwise dictated by actual growth.

1.4. Purpose and Need for Recommended Alternative

The findings presented in this report show that there are several deficiencies within Tetonia's wastewater collection and treatment system which include:

1. Only a portion of the system has been cleaned and video inspected in recent years.
2. I & I
3. Aging Infrastructure
4. Sizing
5. Treatment lagoons Capacity
6. Measuring devices etc.

The recommended alterative presented in this report includes system cleaning and video inspection following by the I & I pipe replacement. ..... After these improvements are completed,

the City should reevaluate the rate at which the lagoons are reaching capacity and construct a new lagoon cell prior to capacity being reached or .....

1.5. Abbreviations

ADD	Average Day Demand
AOI	Area of Interest
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
ft	feet
gal	Gallon
gpcd	Gallons per Capita per Day
gpd	Gallons per Day
gpm	Gallons per minute
hp	Horsepower
IDEQ	Idaho Department Environmental Quality
in	inch
PHF	Peak Hour Flow
psi	Pounds per square inch
SCADA	Supervisory Control and Data Acquisition
USDA	United States Department of Agriculture

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2. Existing Conditions

The purpose of this section is to establish the existing conditions for the Tetonia Wastewater System which includes the existing environmental conditions and the system boundaries.

Upon approval of this study by DEQ and the selection of the preferred alterative by the City of Tetonia, an Environmental Information Document (EID) may or may not be needed to proceed with a project. For sewer line replacement within existing previously disturbed corridors, a categorical exclusion with supporting documentation may be all that is needed.

2.1. Boundary and Location

The study includes the City of Tetonia, Idaho and all its surrounding areas, as shown in Figure 2-1. The planning area consists of the city limits along with some proposed development areas, and the wastewater treatment facilities that are outside of the boundary.

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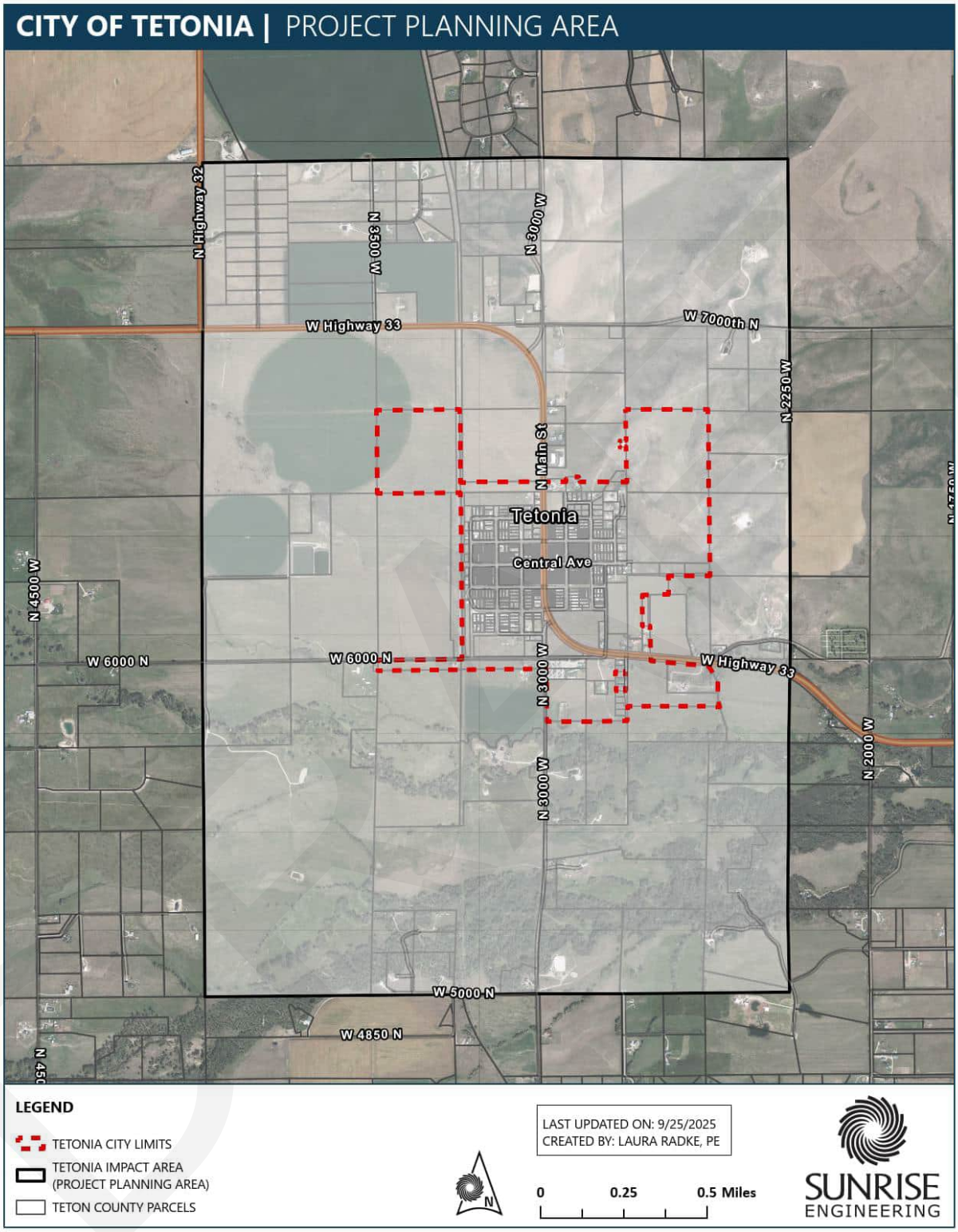

Figure 2-1 City of Tetonia Project Planning Area

2.2. Existing Environmental Conditions

Several environmental conditions will be discussed in detail. This section will provide an understanding of the area's conditions. Within this section, physiography, hydrology, economic status, and more will be considered.

2.2.1. Physiography, Topography, Geology, and Soils

The City of Tetonia is in the eastern corner of Idaho, along State Highway 33, located in the northeastern portion of Teton County. The City lies mostly in Sections 28 and 29 of Township 6 North, Range 45 East (latitude 43 degrees 48 minutes North and longitude 111 degrees 9 minutes West). It is approximately six miles from the Idaho-Wyoming border and is bisected by Idaho State Highway 33.

Tetonia is characterized by the surrounding mountains, including the Teton Mountain Range on the east, and Grand Teton located just 12 miles southeast of Tetonia, within Grand Teton National Park. The City itself sits on relatively flat terrain, with higher elevations on the northeastern portion of city limits with elevations as high as ~ 6270 ft, sloping down to the west side of town with elevations as low as ~6035 ft. The city limits cover an area of 362 acres and experience an elevation change of +/- 235 ft.

Based on the United States Geological Survey (USGS), soils in the project area are primarily loam and gravelly loam in the upper layers and it becomes more sandy and extremely gravely sand the deeper it gets (United States Department of Agriculture, 2025). More detailed information regarding the soils, susceptibility to corrosion of concrete and steel, shallow excavation areas, and farmland classifications are provided in Appendix ___. Table 2-1 shows the distribution of the different types of soils that make up more than 1% of the area within the project area. A soil map can be found in Appendix ___.

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Table 2-1 Soil Classifications in the City of Tetonia Planning Area

Soil Name	Acres in AOI	Percent of AOI
Redfish-Foxcreek complex, 0 to 2% slopes	133.1	4.7%
Redfish mucky peat, 0 to 2% slopes	617.6	21.9%
Snyderville-Driggs complex, 0 to 8% slopes	750.2	26.6%
Alpine gravelly loam, 4 to 12% slopes	44.5	1.6%
Alpine gravelly loam, 0 to 2% slopes	30.8	1.1%
Alpine-St. Anthony complex, 0 to 2% slopes	662.7	23.5%
Feltonia-Arimo complex, 0 to 2% slopes	34.0	1.2%
Ririe-Bill complex, 0 to 8% slopes	49.0	1.7%
Parkalley gravelly loam, 8 to 30% slopes	134.3	4.8%
Milk-Bull Complex, 10 to 25% slopes	286.5	10.1%
Pinochle-Connor complex, 12 to 40% slopes	60.5	2.1%

2.2.2. Surface and Ground Water Hydrology

Spring Creek runs approximately 1600 ft south of Tetonia, which merges with the Teton River approximately 4 miles west of Tetonia. Spring Creek runs from east to west and Teton River flows from north and eventually converges with the Snake River. Surface waters surrounding Tetonia are represented in the topographical map shown in Exhibit 1.

The Teton River subbasin is mostly located in east-central Idaho, but partially in Wyoming, it is one of the three subbasins which make up the Henry's Fork Basin. The Teton River drains an approximate area of 1,100 square miles and originates from streams in the Teton, Big Hole, and Snake River Mountain ranges. The river flows over 64 miles to discharge into Henry's Fork River. Henry's Fork joins South Fork Snake River to form the Snake River. A large area of the Teton River subbasin is characterized as Wetlands. The basin receives a significant amount of its water from rainfall as well as surface runoff from the mountains and irrigation water. Peak discharges occur during spring snowmelt (Idaho Department of Environmental Quality, 2021).

The water table depth decreases from north to south, with the highest groundwater depth being more than 6.5 ft below the ground in the majority of Tetonia City Limits. The groundwater depth in the south end of the Tetonia Impact Area is very shallow. Figure 2-2 was created from NRCS soils data and shows the high ground water level below ground surface in units of centimeters (United States Department of Agriculture, 2025). The ground water depth decreases with proximity to the Spring Creek and in some areas, the water table intersects the ground surface forming wetlands as represented by the red areas in the figure. The sewer camera videos from 2024 showed that there are some sections of pipeline that experience infiltration.

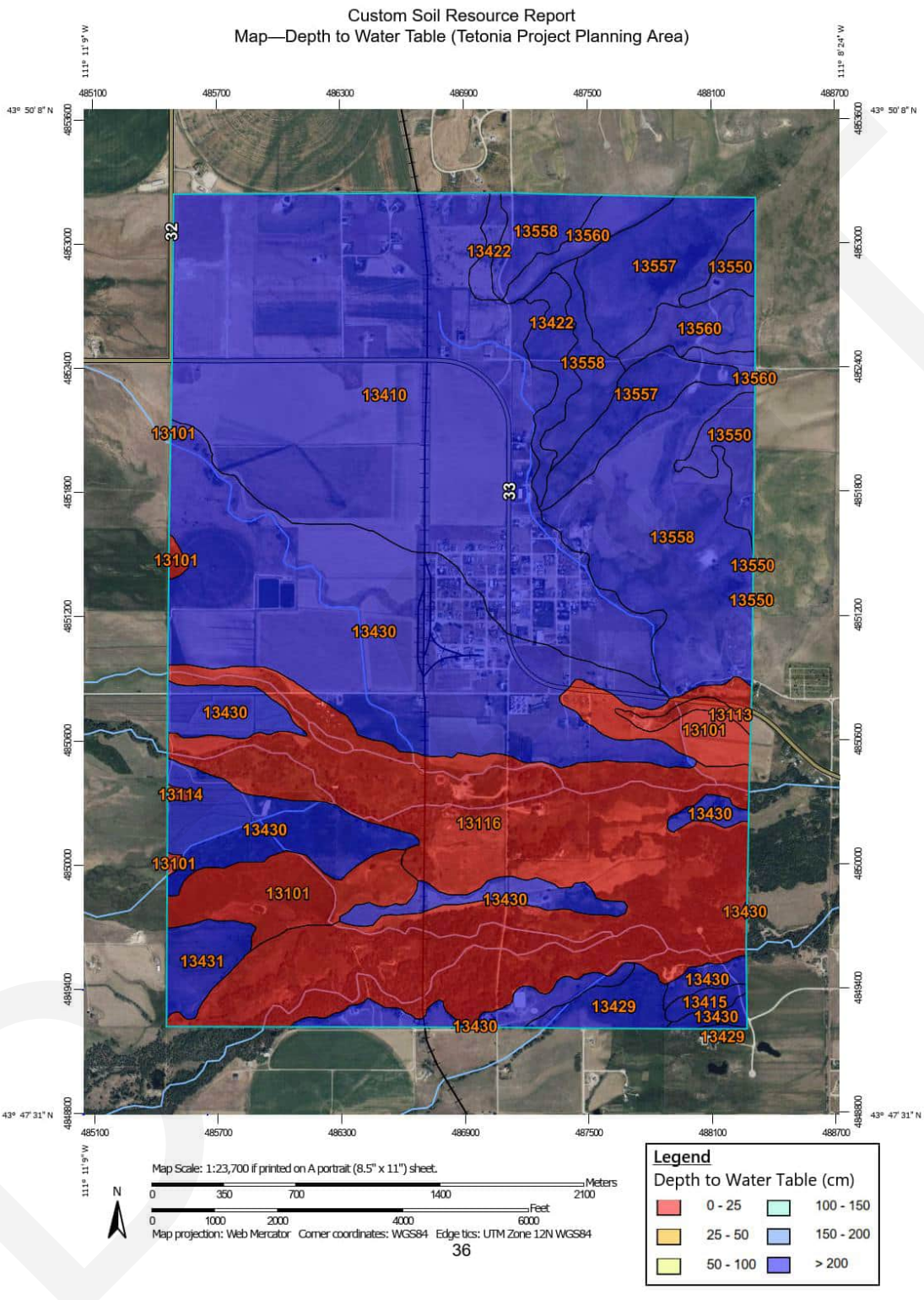

Figure 2-2 NRCS Representation of Depth to Water Table

The groundwater level does not affect the existing lagoons because the elevation is sufficient to provide adequate space between the lagoon floor and high groundwater. The far west edge of the City's land application site has very shallow groundwater levels. Should the City decide to pursue expansion of the lagoon system or constructing a treatment plant, then care should be taken when a new site is selected, as shallow groundwater levels can create difficulties during construction and operation of the site.

As the City continues to replace deteriorated sewer lines, groundwater is not anticipated to be a problem within city limits. For lines that may need to cross a creek or ditch, trenchless construction methods can be used to avoid impact to surface waterways. Sewer Videos & Infiltration?

2.2.3. Fauna, Flora, and Natural Communities

Common plant life in the area includes _____. A report listing threatened, proposed threatened, and proposed endangered species for the area was obtained from the U.S. Fish and Wildlife Service Information for Planning and Consultation (IPaC) website. The full report is included in Appendix __. In the report, no critical habitats were listed for the project planning area. The following four species were listed and designated:

- Grizzly Bear – Threatened
- Monarch Butterfly – Proposed Threatened
- Suckley's Cuckoo Bumble Bee – Proposed Endangered
- Ute Ladies'-tresses – Threatened

There are many migratory birds present within the project planning area. The nearest National Wildlife Refuge is in Wayan, ID which is approximately 56 miles southwest of Victor. The following migratory birds are listed by the U.S. Fish & Wildlife Services as birds of conservation concern (U.S. Fish & Wildlife Service, 2025).

- American White Pelican
- Broad-tailed Hummingbird
- California Gull
- Calliope Hummingbird
- Cassin's Finch
- Clark's Grebe
- Evening Grosbeak
- Northern Harrier
- Olive-sided Flycatcher
- Rufous Hummingbird
- Safe Thrasher

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- Willet

2.2.4. Housing, Industrial, and Commercial Development

Tetonia is a very small town, with a population of 308 people per the 2020 Census (United States Census Bureau, 2020). The City only has a small number of businesses, including _____. The surrounding area is mostly farmland, with a few homes located outside of city limits. A new development with 150 units is proposed on the far northeast side of town. Approximately 558 acres of land are owned by a developer who wants to build housing as well as commercial infrastructure on this property. A portion (~45 acres) is inside the city limits; however the remaining properties are currently outside of city limits. The developer is working towards annexing these in the future. This new development was a large driving factor in preparing this Wastewater Facilities Planning Study, as a development of this size would double the current size of the town. With such a large increase in population and development, the existing infrastructure would need to be significantly improved and expanded.

The Teton Valley is becoming more popular and the beautiful landscape draws many people to the area. For this reason, developers are highly interested in constructing more housing and commercial sites to draw more people into this area. The median household income per the 2023 American Community Survey was estimated at $63,125 in Tetonia. According to the same survey, there are 106 families and living arrangements and a total number of housing units of 111. Therefore, there are approximately 2.9 people per household and housing is very limited (United States Census Bureau, 2020). The complete population statistics obtained from the US Census Bureau are attached in Appendix ___.

2.2.5. Cultural Resources

A search of the National Register of Historic Placed found one listing in Tetonia. The property is referred to as 'Hollingshead Homestead' and is located at 107 West 1200 North Teton County Road and was accepted into the National Register of Historic Places in December of 2005. The site is a private property, encompassing approximately 5 acres and consisting of 8 buildings and four structures. The property is registered as a historic place due to its association with the early settlement patterns in Teton Valley and because of the variety of methods used for its log construction. The area will not be affected by improvements to the wastewater system. Before any construction or ground disturbance takes place, the proper authorities will be contracted to ensure no cultural resources are disturbed.

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2.2.6. Utility Use

Tetonia is served by City-owned and operated municipal water and sewer systems. Power comes from Fall River Coop, fiber is available through Silver Star, and internet is available to residents from multiple service providers. Natural gas is not available in the City.

2.2.7. Floodplains & Wetlands

There are currently no effective FEMA (Federal Emergency Management Agency) mapped floodplains within Tetonia City Limits, however there are some effective floodplain exists south of City limits, within the project area. This area is designated as Flood Zone A and represents the 100-year flood (1% annual chance). The map panel is 16081C0100C and dates back to 08/04/1988. The map panel is attached in Appendix __ (FEMA, 2025). The Idaho Department of Water Resources (IDWR) has integrated the FEMA map into their GIS database, from which Figure 2-3 has been extracted (IDWR, 2025)

The preliminary maps which are anticipated to become effective in June of 2026, show Zone X, which is representative of the 500-year (0.2% annual chance) Flood within the city limits. The preliminary maps also show Zone A and Zone X to the south of Tetonia City limits, which follow Spring Creek and the Spring Creek Split. Tetonia City Limits and the project area are shown on map panels 16081C0158D, 16081C0159D, and 16081C0170D, which are attached in Appendix ___. The preliminary issue date of these maps is 08/15/2024 (FEMA, 2025). The effective floodplain data was downloaded from the FEMA Map Center to create the map shown in Exhibit 2.

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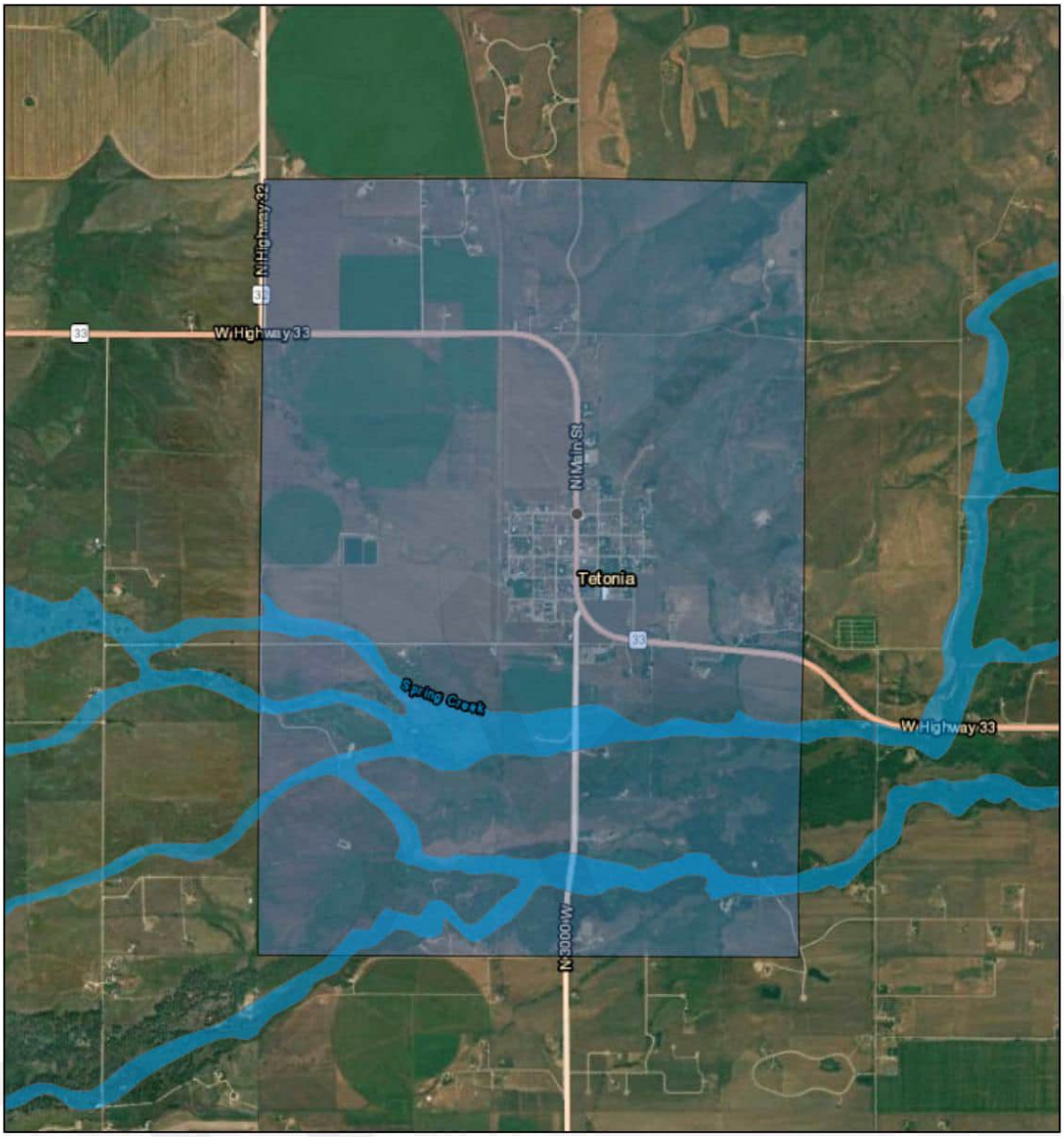
CITY OF TETONIA - EFFECTIVE IDAHO FLOOD HAZARD MAP



9/29/2025, 1:16:54 PM

1:40,000

0 0.25 0.5 1 mi

0 0.38 0.75 1.5 km

FIRM: Flood Zone

1% Annual Chance Flood Hazard

FIRM: Flood Zone AE

1% Annual Chance Flood Hazard

Project Planning Area

Esri, HERE, Garmin, Esri, HERE, Maxar

Idaho Department of Water Resources

Maxar | IDWR, FEMA, Silver Jackets | FEMA, IDWR, Custer County, Idaho | FEMA, IDWR, Custer County, Idaho, Silver Jackets | Idaho Department of Water Resources | Esri, HERE | Esri, HERE,

Figure 2-3 Idaho Department of Water Resources Floodplain Map (IDWR, 2025)

According to the U.S. Fish and Wildlife Service – National Wetlands Inventory, the only wetlands located within Tetonia City Limits is a Riverine crossing through the east, a small freshwater pond, and a 12-acre area of freshwater emergent wetland located on the far southeast corner of the City. There are also several wetlands in close proximity to the City's boundaries, primarily categorized as either Freshwater Emergent Wetland or Freshwater Forested/Shrub Wetland. These wetlands are mostly found along the banks of Spring Creek. There is also a Riverine flowing just northeast of the Tetonia Wastewater Treatment Plant (U.S. Fish and Wildlife Service, 2025). Most of the anticipated development will occur outside the wetland areas, with only some Riverines crossing these properties. If any construction does occur within any wetlands, the restoration and preservation of these wetlands will be prioritized. A summary of wetland types and their locations in and around the City of Tetonia can be found in Figure 2-4.

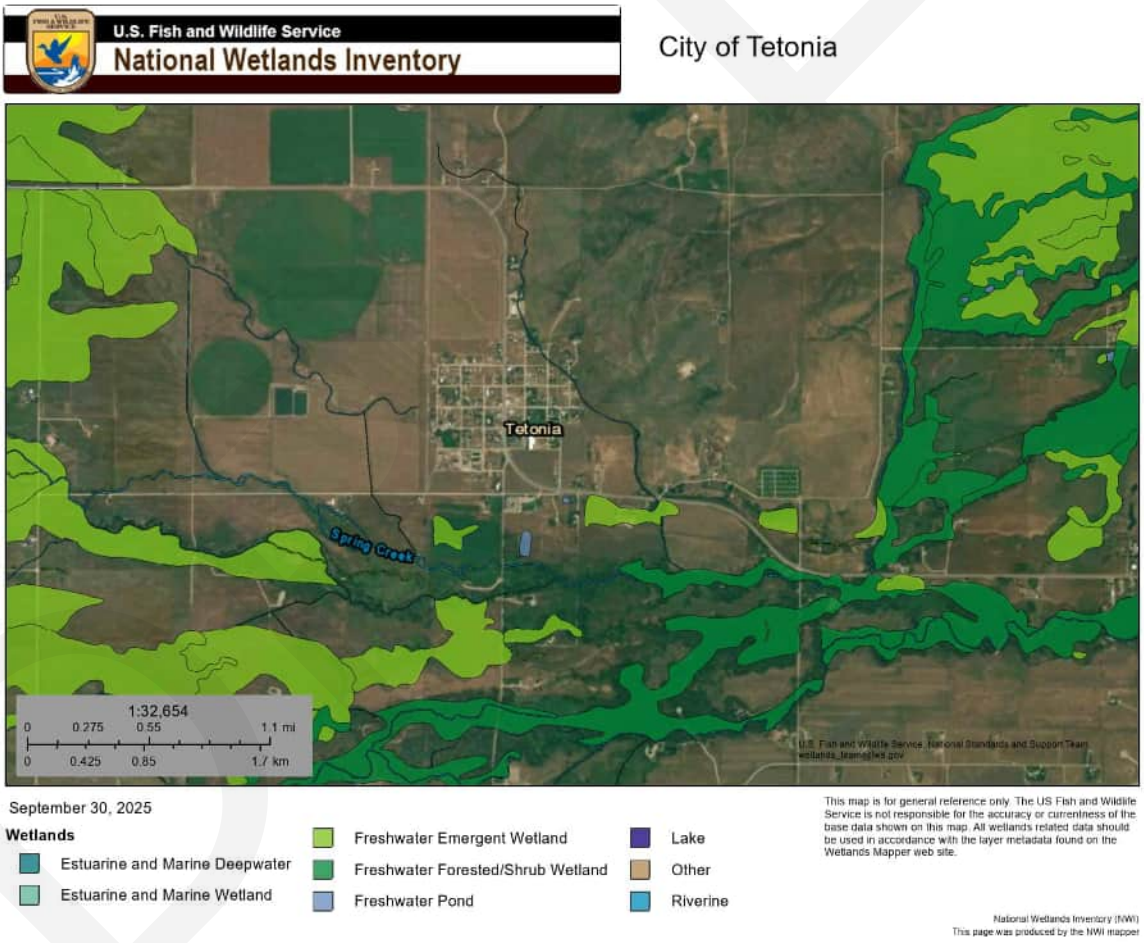


Figure 2-4 U.S. Fish and Wildlife Service Wetland Inventory Map (U.S. Fish and Wildlife Service, 2025)

2.2.8. Wild and Scenic Rivers

There are no wild or scenic rivers within or near the study area (National Wild and Scenic Rivers System, 2025). The nearest river that qualifies is the Snake River Headwaters in western Wyoming as shown in Figure 2-5.

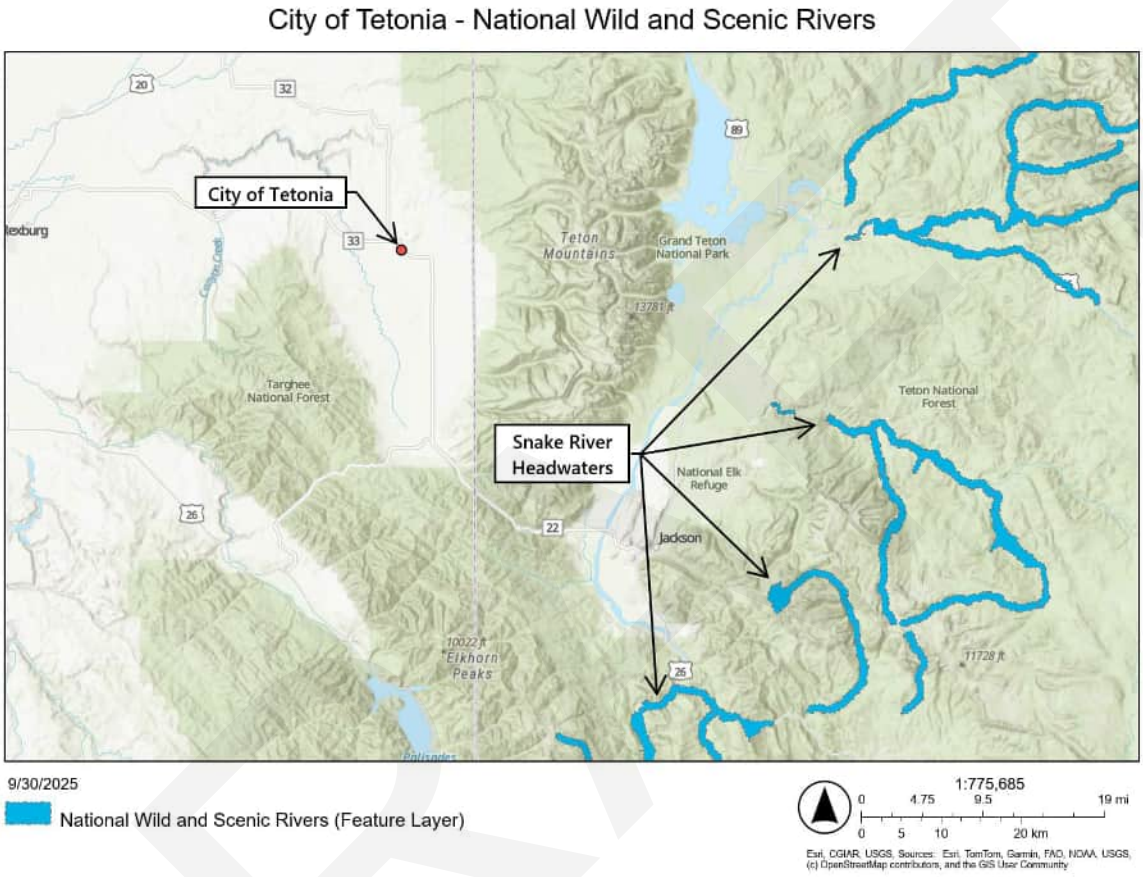


Figure 2-5 U.S. Forest Service National Wild and Scenic Rivers (U.S. Forest Service, 2025)

2.2.9. Public Health and Water Quality Considerations

As the community grows, it is important to provide wastewater collection and treatment facilities capable of handling and treating the wastewater generated by the community. If this is not provided, the health of the public could be at risk.

2.2.10. Prime Agricultural Farmlands Protection

Prime agricultural lands are those that are most suitable for growing crops. There are multiple considerations when classifying prime land, such as fertility, moisture levels, depth, and texture.

Within the project planning area, multiple areas in and around the City are considered prime farmland or farmland of statewide importance if irrigated. This makes up approximately 56%, totaling nearly 1,580 acres. Figure 2-6 shows the farmland classification from the soil survey provided by the USDA and the NRCS. (United States Department of Agriculture, 2025). The full soil report is included in Appendix ___.

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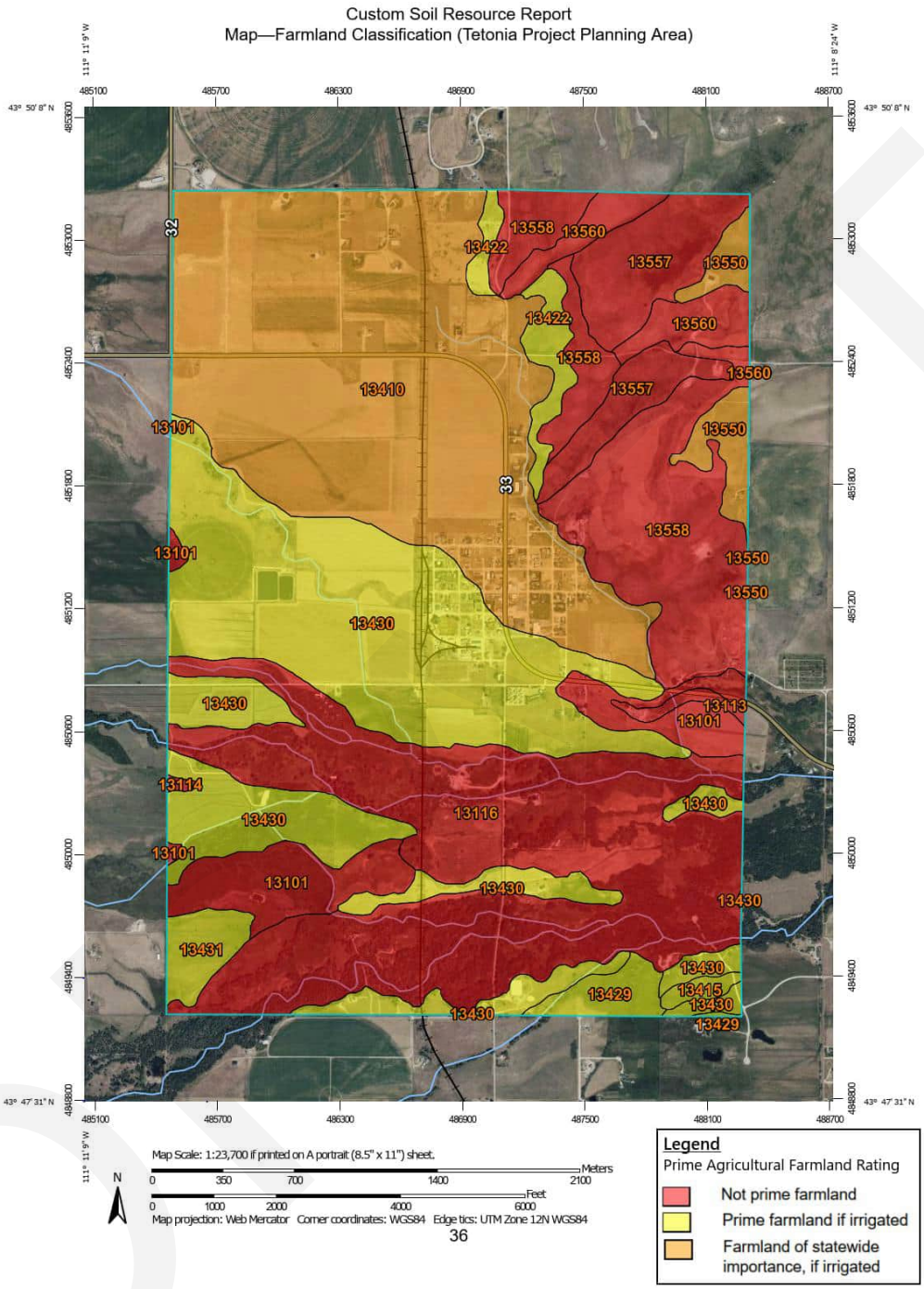

Figure 2-6 USDA Soil Survey Prime Farmland Classification (United States Department of Agriculture, 2025)

2.2.11. Proximity to a Sole Source Aquifer or Stream Flow Source Area

The City of Tetonia is situated within the Pacific Northwest basin-fill aquifer as shown in Figure 2-7 (Idaho DEQ, 2008). Tetonia is located outside the Snake River Plain Sole Source Aquifer but lies within the source area as shown in Figure 2-8. This map displays all known Idaho aquifers (Idaho State University, 2025)

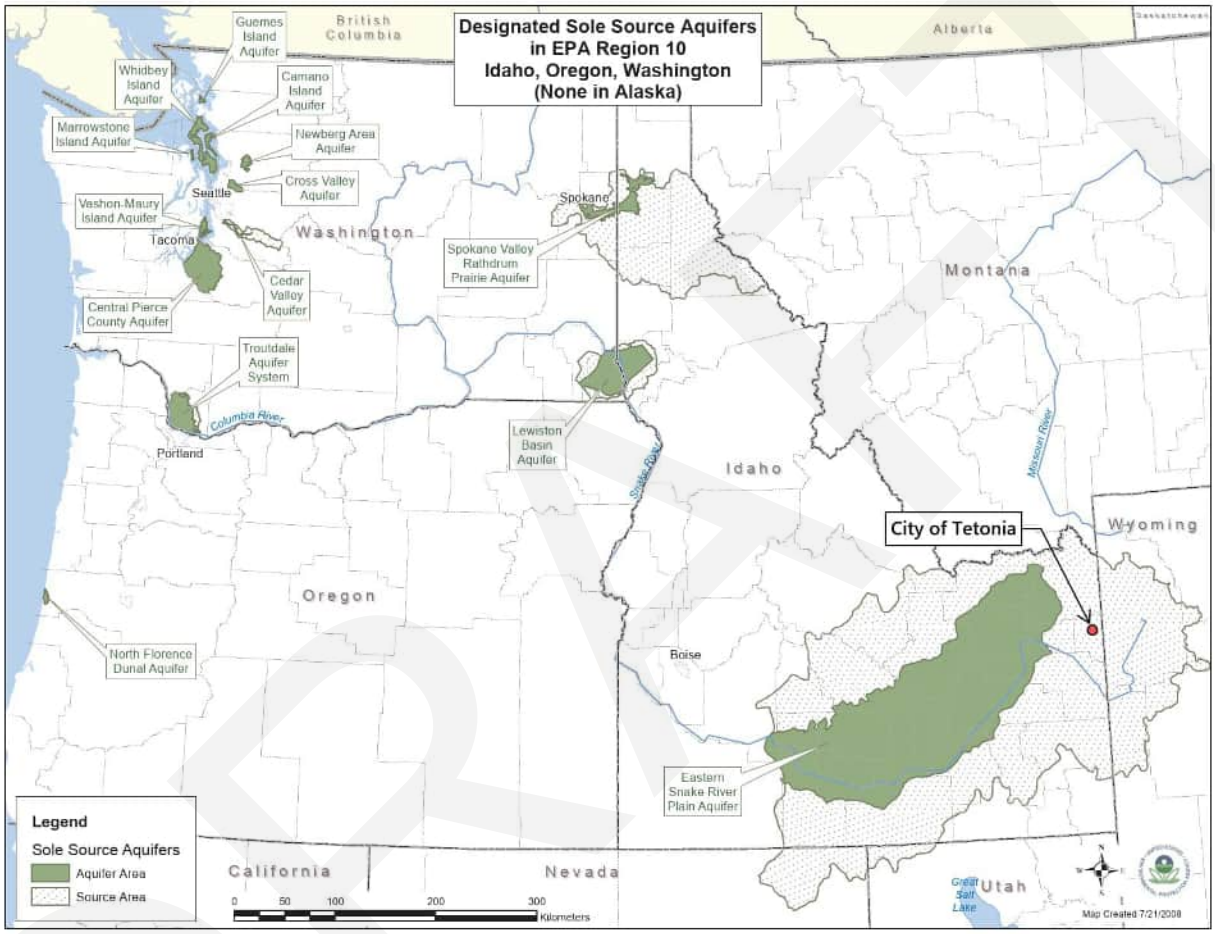

Figure 2-7 EPA Region 10 Sole Source Aquifers (Idaho DEQ, 2008)

The groundwater depth varies significantly in the project planning area. A search of the Idaho Department of Water Resources 'Find a Well' database showed that the static water level of wells in Tetonia City Limits range from 35 to 145 ft below ground surface. Water levels in the surrounding area range from approximately 12 ft to 318 ft, with groundwater levels being as low as 30 ft near the Wastewater Treatment Facility and 10 ft at the land application site (Idaho Department of Water Resources, 2025).

Although the groundwater levels around the treatment site are fairly shallow, the wells located in close proximity (within ~1500 ft) are either monitoring wells or wells with zero production. Therefore, no wells that are currently in use, are located immediately downgradient of the treatment facilities. If the land around the treatment facility is developed, wells should not be drilled within 500 ft of the treatment facility, and the development should be connected to the municipal water system if possible.

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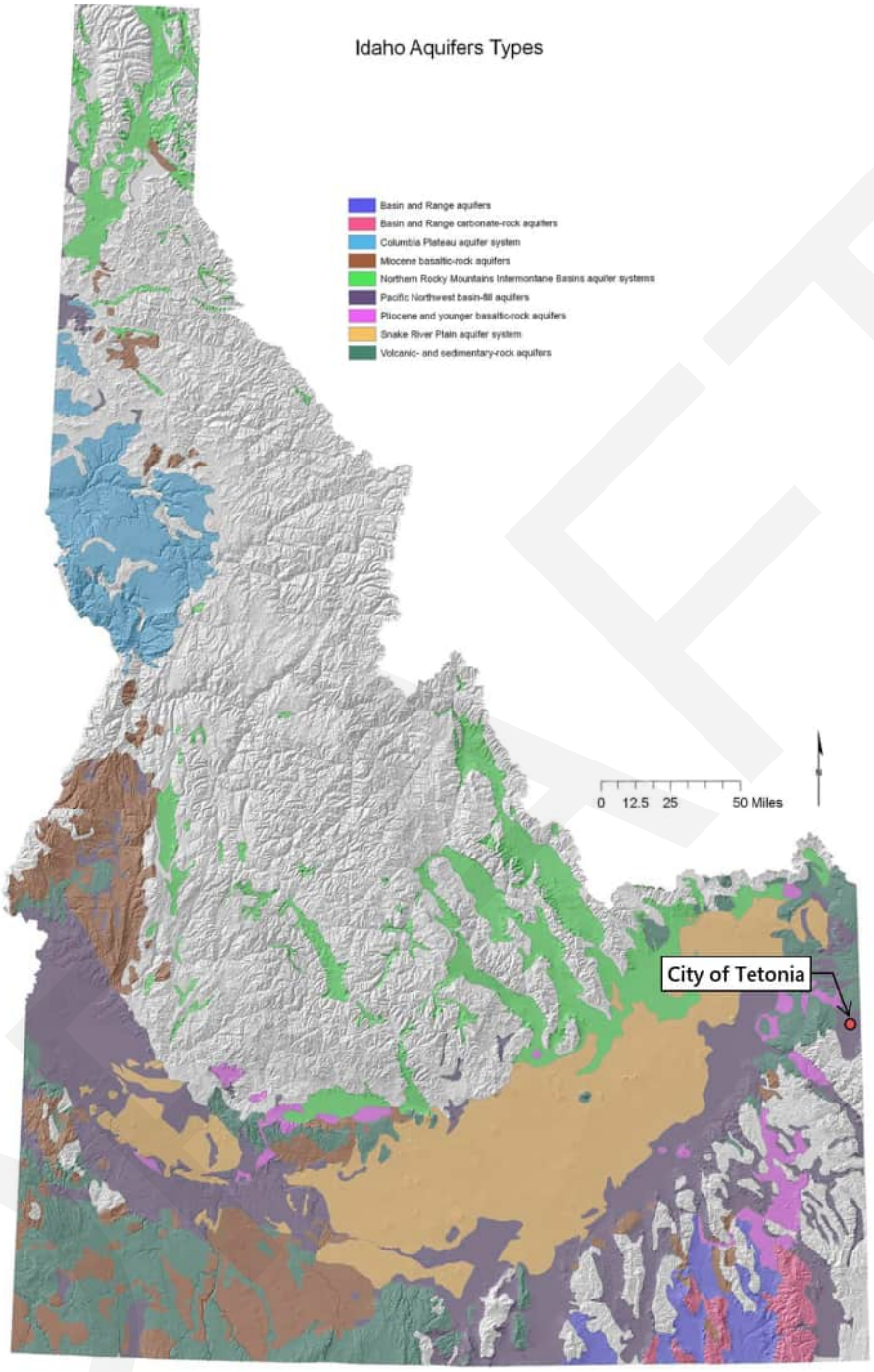

Figure 2-8 Idaho Aquifers (Idaho State University, 2025)

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2.2.12. Land Use and Development

Land within the City is primarily used for residential and commercial purposes. There are 111 total housing units in Tetonia, 106 of which are occupied (United States Census Bureau, 2020). The full census data results are provided in Appendix ___.

Tetonia is divided into agricultural, residential, overlay, open space, commercial, and business park/manufacturing districts. The agricultural districts are made up of Agriculture (A) and Transitional Agricultural (TA) zoning. The residential districts include Single-Family Residential (R1), Medium-Density Residential (R2), High-Density Residential (R3), and Multiple Use Districts (MU). The overlay district consists of Township Overlay (R2T), providing narrow lots. The open space district includes Open Space (OS) which includes parks, walking trails, and other conservation of land. The commercial district consists of Downtown Commercial (CD), Neighborhood Commercial (C1), Community Commercial (C2), and Highway Business (C3) zoning. The business park/manufacturing districts contain Business Parks (BP), Light Manufacturing (M1), and Medium Manufacturing (M2). Definitions of each zone can be found in Article 2 of Chapter 10 of the Tetonia Municipal Code. A zoning map of the City was created using zoning information from the Teton County Address & Parcel Viewer website and is shown in Figure 2-9.

The Tetonia Impact Area does not currently have a designated zoning classification shown on the map, as discussions with the County are still ongoing. At this time, the area is considered Rural with a minimum lot size of 5 acres. It is anticipated that the area will be designated as Rural in the future, with a minimum lot size of 2.5 acres. The boundaries of the Impact Area are also under review, and a small portion on the south side is expected to be removed.

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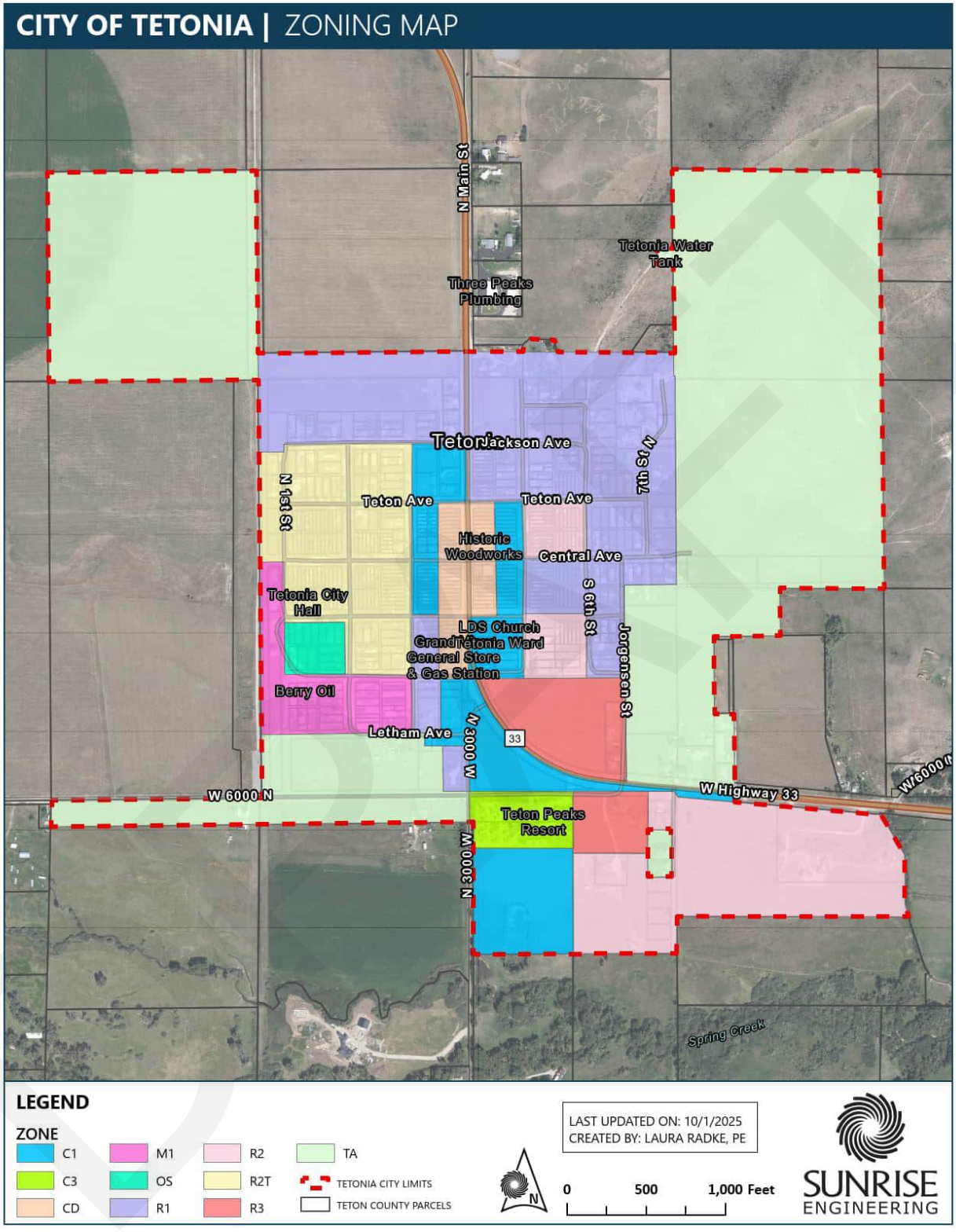
CITY OF TETONIA | ZONING MAP
N Main St
Tetonia Water Tank
Three Peaks Plumbing
Jackson Ave
N 1st St
N 4th
Teton Ave
Teton Ave
Historic Woodworks
Central Ave
Tetonia City Hall
S 6th St
LDS Church
Grand Tetonia Ward
General Store
& Gas Station
Jorgensen St
Berry Oil
Letham Ave
N 3000 W
33
W 6000 N
W Highway 33
Teton Peaks Resort
N 3000 W
Spring Creek
LEGEND
ZONE
C1
C3
CD
M1
OS
R1
R2
R2T
R3
TA
TETONIA CITY LIMITS
TETON COUNTY PARCELS
LAST UPDATED ON: 10/1/2025
CREATED BY: LAURA RADKE, PE
N
0
500
1,000 Feet
SUNRISE ENGINEERING

Figure 2-9 Tetonia Zoning Map

2.2.13. Precipitation, Temperature, and Prevailing Winds

The climate of Tetonia is typically cold and dry, with long winters and short summers. An Experiment weather station is located in Tetonia (Idaho Station 109065). Based on data collected from 1949 to 2016 available from the Western Regional Climate Center, the *average* temperature and precipitation data are as follows (Western Regional Climate Center, 1949-2026):

Annual maximum temperature =	53.0°F
Annual minimum temperature =	25.5°F
Maximum temperature =	80.6°F (July)
Minimum temperature =	6.0°F (January)
Annual total precipitation =	16.78 in
Annual total snowfall =	28.0 in
Maximum snow depth =	4 in (January)

The weather station in Tetonia does not record the prevailing wind direction or the pan evaporation. Therefore, the next closest weather station was chosen, which is in Rexburg, Idaho. Rexburg is approximately 30 miles west of Tetonia, indicates a pan evaporation rate of 34.53 inches per year. A correction factor of 0.8 should be applied for purposes of evaporation calculations, resulting in an evaporation rate of 27.62 inches (Western Regional Climate Center, 1977-2005). The annual prevailing wind direction is from the South (Western Regional Climate Center, 1992-2002).

2.2.14. Air Quality and Noise

Tetonia has good air quality except when smoke from wildfires impacts the area. The Unites States Environmental Protection Agency (EPA) generates Air Quality Index Reports for cities throughout the Unites Sates. The closest station for which an Air Quality report is available is in Idaho Falls, Idaho which is approximately 50 miles southwest of Tetonia. The median AQI in 2025 was 45, which is considered a good AQI with little or no risk at all (United States Environmental Protection Agency, 2025). Since Idaho Falls is a much larger City than Tetonia, and levels here are still considered good, the air quality in Tetonia is also considered satisfactory. Figure 2-10 was retrieved from the Idaho DEQ website and shows the air quality index for various pollutant levels.

The long-term operation of the facility will not significantly affect air quality. Lagoon-type treatment facilities typically tend to cause odors during the spring when warm water on the bottom turns over with cool surface water. However, this occurrence is limited to 2-3 weeks each year. The operator and city personnel have not reported any significant odors. The area to the east (the direction to

which the prevailing wind blows) is currently not populated. Consequently, any odors will not adversely impact residents. Overloading of the lagoons with excessive BOD can contribute to odors.

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

Figure 2-10 Air Quality Index (Idaho Department of Environmental Quality, 2025)

Noise levels in the City are relatively low with most noise coming from traffic on Highway 33 that runs through the City. According to the National Transportation Noise Map, the only areas with noise levels in 2020 within Tetonia are along the state highway. All noise levels in the area remain below 60 dBa (U.S. Department of Transportation, 2020).

2.2.15. Energy Production and Consumption

The existing wastewater system consumes electricity at the lift station that pumps to the treatment lagoons, the chlorination building that treats the wastewater at the treatment lagoons, and the pump for the land application. The lagoons receive some minor aeration from __ onsite ___ that also require energy.

2.2.16. Socioeconomic Profile of the Affected Community

Many people who live in the Teton Valley and Tetonia work in Jackson Hole, Wyoming and surrounding areas. According to the Census, ___ of people commute to their place of work. According to the 2020 US Census, the population of Tetonia is 308. The historical population from each decennial census from 1970 to 2020 and the average annual growth rates are shown in Table 2-2 (United States Census Bureau, 2020).

Table 2-2 Historic Population Data

Year	Population	Annual % Growth
1970	176	-
1980	191	0.8%
1990	132	-3.6%
2000	230	5.7%
2010	269	1.6%
2020	308	1.4%

50-Yr (1970 – 2020) Avg =	1.1%
40-Yr (1980 – 2020) Avg =	1.2%
30-Yr (1990 – 2020) Avg =	2.9%
20-Yr (2000 – 2020) Avg =	1.5%
10-Yr (2010 – 2020) Avg =	1.4%

Over the past 50 years, the population has shown some fluctuations, with an overall positive growth trend. The average annual growth rate over the last 30 years was 2.9%. The City provided a list of new building permits starting in 2020. This list was utilized to estimate the current 2025 population. Based on the number of new building permits, Tetonia has experienced an average annual growth rate of 8.5% from 2020 to 2024.

Table 2-3 Number of New Building Permits since 2020

Year	# of New Building Permits	Estimated Population[1]	Annual % Growth
2020	10	337[2]	2.3%
2021	8	360	6.9%
2022	9	386	7.3%
2023	12	421	9.0%
2024	2	427	1.4%
2025	5	442	3.4%
2020 to 2024 Average[3] =			**8.5%**

The 2024 American Community Survey estimated the median household income at $78,864, which is below the Idaho average ($81,166). Of the people living in Tetonia, 6.1% live in poverty. The 2023 American Community Survey recorded a total of 111 housing units, 106 (95%) of which are occupied. Based on the total number of occupied housing units and the population, it is estimated that 2.91 people occupy each household (United States Census Bureau, 2020).

[1] Population estimated based on assumption of 2.91 people per household based on 2020 Census.
[2] Based on 2020 Census Population + (10 new Building Permits * 2.91 people per household)
[3] Growth rate used for 2020 to 2024 due to the year 2025 not being completed at the time the growth rate was discussed with the City at the City Council meeting on ____.

2.3. Existing System Users

A sanitary sewer system's connections can be categorized by type, including residential, commercial, industrial, etc. The City of Tetonia currently has 163 connections to the sanitary sewer system, 140 of which are residential and 23 of which are commercial connections.

In this report, an Equivalent Residential User (ERU) is defined as the amount of wastewater discharged to the system by an average single-family residential connection. ERUs can be used to compare the wastewater produced by commercial users to a single residential connection. For this study, ERUs were used to determine the loading on the system.

Wastewater and culinary water ERUs are closely related, due to the majority of one system flowing directly into the other. However, the number of ERUs in Tetonia slightly differs in the two systems, due to the fee schedule for the water and sewer being different. The number of ERUs for the sewer system were determined by using the Table provided in the Sewer Fee Schedule of the Tetonia Resolution No. 2024-03. All residential units were assumed to be a single dwelling unit, and each commercial site was evaluated to see which classification is most suitable. The Resolution and a list of the ERU determination is included in Appendix __. There is one commercial connection, which is considered as a 'RCRA Hazardous Waste Site' per the IDEQ Facility Mapper Tool (Idaho DEQ, 2026). This site is located at 3193 Leigh Ave and is listed as 'Berry Oil' in the ERU determination list. The Resolution uses 'Equivalent Dwelling Units (EDUs)' instead of 'Residential Units'. These terms mean the same thing and can be used interchangeably. A summary of the current system users is shown in Table 2-4.

Table 2-4 Current (2025) System Users

# of Residential Connections	140
# of Commercial Connections	23
Total Connections	**163**

# of Residential ERUs	140
# of Commercial ERUs	61
Total # of ERUs	**201**

2.4. Existing Flow Data Evaluation and Flow Criteria

2.4.1. Existing Flows

The City of Tetonia has a main lift station located northeast of the treatment facility that pumps all the wastewater to the lagoons coming from the collection system. A flow meter is located

downstream of the Lift Station inside the Control Building and is connected to the City SCADA system. However, this flow meter was found to be inaccurate. The 'Annual Report for Sewer Lagoon, Wastewater Lift Station' dated 9/24/2025, indicated that the flow meter readings were nearly 100 gpm higher than what was observed during pump tests. This discrepancy was also supported by comparing data retrieved from the SCADA system with manually recorded pump run times. This comparison also suggested the flow meter overestimated the actual pumped volumes. Due to these inconsistencies in flow data, the flow meter readings were not used to establish design flow criteria for the system.

The City of Tetonia recorded daily pump run times for both pumps from January 2024 to December 2025, with a pause in data collection between June and November 2025 due to changes in operator personnel. To calculate system flows, these pumps run times were multiplied by each lift station pump's flow rate obtained from the pump curve, which is included in Appendix ___.

The 'Annual Report for Sewer Lagoon, Wastewater Lift Station Report' also provided flow rates for each pump. However, the Tetonia Public Works Director noted that the pump tests did not account for continuous influent flow into the lift station. To address this, operators conducted two drawdown tests on separate days to determine the average influent flow rate, which was then subtracted from the pumping rates stated in the report. When comparing these pumping rates to the design flow shown on the pump curve, it showed that the flow rates were very similar. Since each pump is the same make and model with the same impeller diameter, the same flow rate of 363 gpm was used for both pumps.

Therefore, the pump's hourly run time and pumping rates were multiplied to calculate system flows for 2024 and 2025. Daily Wastewater Treatment Plant flow data, in total gallons, was available for 2023 as well; however it is uncertain how this data was collected. The raw data and the calculations to determine the design flows is included in Appendix ___. Average daily flows by month for 2023-2025 are shown in Figure 2-11. Flows throughout the different years are fairly similar to one another, with February and March being much higher in 2024. Sewer flows should not show significant variations in flow as culinary water would, as water used for irrigating of lawns is not affected.

The water flow data was also evaluated to see how it compares to the sewer data. However, the water flow data revealed much larger flows than expected. Average daily flows for the system were 91 gpm in 2025, which showed an average of 298 gpcd, which is significantly higher than the sewer flows of 67 gpcd. This discrepancy is most likely caused by system users watering their lawns in the summertime and it is possible that there are some leaks in the water distribution system or faulty SCADA readings. Even though the City's Water fee schedule has a maximum allowable gallon of water, the City does not consistently read the individual meters. Without monthly readings, the City cannot charge the users appropriately, which could results in significant water usage as there is no

consequence. Due to the water flows being so much larger than the sewer flows, the water demands were not further interpreted in this study.

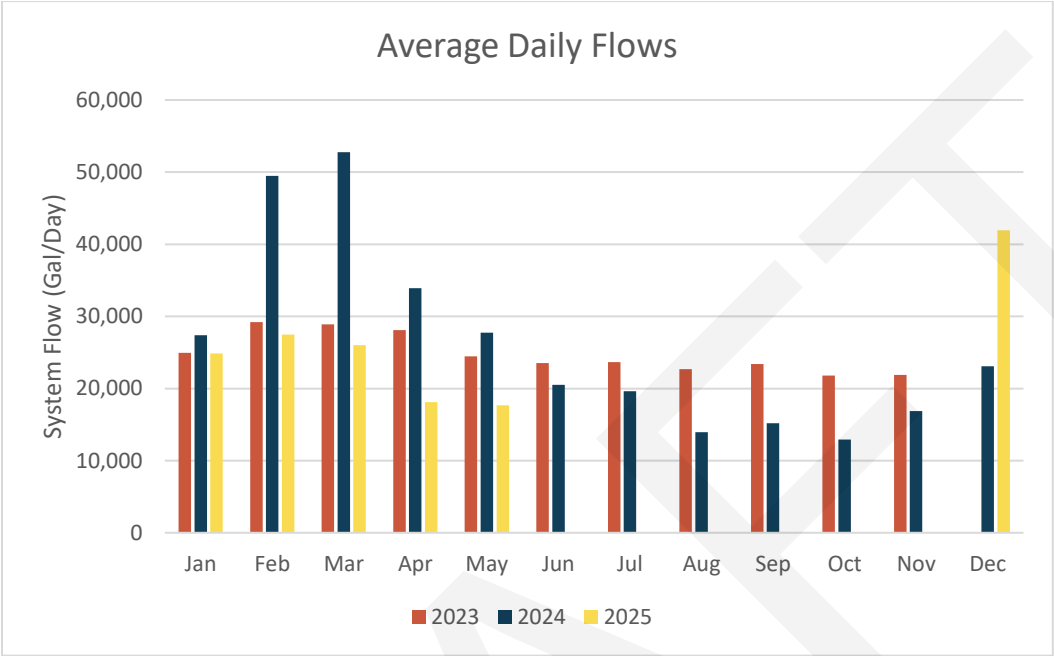

Figure 2-11 Average Daily Flow by Month

2.4.2. Average, Peak, Dry, and Wet Weather Flows

The flows vary depending on the time of year, with significantly higher flows in February and March of 2024. Higher average day flows were also observed in December of 2025. It is typical for system flows to be higher during wet weather than during dry if infiltration and inflow (I&I) is present in the system. Typically, during the spring and early summer, flow rates are high because of I&I from high groundwater and snowmelt runoff. In winter, flows are typically lower because I&I is reduced when the ground freezes. However, snowfall and snowmelt is different every year, which is why the range in months considered as dry weather and wet weather flow vary. Total precipitation data, including precipitation from rain and melted snow, was obtained from the 'National Centers for Environmental Information (NOAA)' website. The climate data online tool search was utilized to extract the precipitation data for each month from 2023 to 2025. Months that had less than 1 inch of precipitation were considered dry months, and months with more than 2.5 inches of precipitation were considered wet months. The average day flows from these months were then averaged to determine dry and wet weather flows. The average and peak flows were also determined for each year and the maximum value was used as a design criteria. The design criteria is important, as this is the data that is inputted into the sewer model and utilized for lagoon storage capacities. Historic

flow data as well as design flows are shown in Table 2-5. A list of definitions and how it was obtained in the provided data is provided below:

ADF (Average Daily Flow) = flow on an average day during the year. This flow was obtained by dividing the total influent flow in one year, by the number of days that were recorded.

Dry Weather ADF = average flow during the dry season. The monthly flows were averaged during the months that were considered dry that year, based on precipitation data from NOAA.

Wet Weather ADF = average flow during the wet season. The monthly flows were averaged during the months that were considered wet that year, based on precipitation data from the Western Regional Climate Center.

MMADF (Maximum Month Average Day Flow) = the average day flow of the month with the highest flows that year. This was determined by determining the maximum of the average day flows each month.

MDF (Maximum Daily Flow) = maximum flow in a single day. This was determined by finding the maximum flow in the entire year.

PHF (Peak Hour Flow) = highest flow in one hour of the day. Since there was no hourly data available, only daily data, a peaking factor was used instead. Figure 3-13 on page 202 of the Metcalf & Eddy Wastewater Engineering book shows a graph relating peaking factors to the size of City (Metcalf & Eddy Inc., 2003). Since Tetonia's population is less than 4,000 people, a peaking factor of 4 was utilized. This was multiplied by the ADF to obtain the PHF.

Table 2-5 Historic System Flows & Design Criteria

Year	2023	2024	2025	Design Criteria			
Estimated Population	421	427	442	**Maximum**	**Peaking Factor**	**gpm/ERU[4]**	**gpd/ERU[4]**
Total MG	8.2	9.5	10.8	10.8	-	-	-
ADF (gpm)	17	19	21	21	1.0	0.10	148
Dry Weather ADF[1] (gpm)	16	12	12	16	0.8	0.08	113
Wet Weather ADF[2] (gpm)	17	27	24	27	1.3	0.13	191
MMADF (gpm)	20	37	29	37	1.8	0.18	262
MDF (gpm)	28	72	54	72	3.5	0.36	512
PHF[3] (gpm)	69	74	82	82	4.0	0.41	590

NOTES:
[1]Dry Weather Flow = ADF of dry months - see Precipitation Table.
[2]Wet Weather Flow = ADF of wet months - see Precipitation Table.
[3]Peaking Factor for PHF = 4
(Based on Metcalf & Eddy 'Figure 3-13' on page 202)
[4] # of Residential ERUs = 140
[4] # of Commercial ERUs = 61
[4] # of Totall ERUs = 201

ADD per person = 67 gpcd

As mentioned previously, the dry and wet weather flows were determined based on the months that were considered dry or wet that particular year. Figure 2-12 shows the total precipitation each month from 2023 to 2025 and whether it was considered dry or wet. The precipitation values are color coded based on a high to low scale of colors. Green shades represent dry weather and the red shades represent wet conditions.

Total Precipitation (inches)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	2.51	2.46	3.45	1.17	1.54	4.35	0.33	2.81	2.18	3.21	0.59	1.73
	Wet	Wet	Wet			Wet	Dry	Wet		Wet	Dry	
2024	2.63	3.19	1.72	1.32	1.69	0.7	0.45	2.06	1.56	0.31	1.51	2.15
	Wet	Wet				Dry	Dry			Dry		
2025	1.21	2.88	1.32	1.63	1.18	0.24	0.26	1.41	1.47	3.67	0.46	3.16
		Wet			Dry*	Dry	Dry			Wet	Dry	Wet

Source: Western Regional Climate Center (Tetonia Experiment Stn, ID - 109065)

Scale: 0 to 1 Dry
1 to 2.5 Disregard
> 2.5 Wet
* Add due to minimal data available

Figure 2-12 Monthly Precipitation (Western Regional Climate Center, 1949-2026)

2.4.3. Design Flow Summary

Based on historical data, design flows were established by using the maximum value over the last three years, as shown in Table 2-5. Current system flows are summarized in Table 2-6, which represent the flows that will be used to estimate future flows and system capacities.

Table 2-6 System Design Flows (Current)

CURRENT (2025) SYSTEM FLOWS							
Flow Per ERU							
Average Daily	0.10	gpm	148	gpd			
Max Month ADF	0.18	gpm	262	gpd	x	1.8	of Average
Max Daily	0.36	gpm	512	gpd	x	3.5	of Average
Peak Hour	0.41	gpm	590	gpd	x	4.0	of Average
Total Equivalent Residential Users (ERUs)					**201**		
System Flow							
Average Daily	21	gpm	29,682	gpd			
Max Month ADF	37	gpm	52,756	gpd	x	1.8	of Average

Max Daily	72	gpm	103,092	gpd	x	3.5	of Average
Peak Hour	82	gpm	118,728	gpd	x	4.0	of Average

2.4.4. Infiltration & Inflow (I&I)

Infiltration and inflow (I&I) is water other than wastewater that enters the sewer system. There are multiple ways that this water can enter the sewer system. Defective pipe joints, leaky service connections, and faulty manhole joints are the most common sources of infiltration, which is common when high groundwater conditions exist. The groundwater can enter the sewer system through cracks or breaks in pipes and manholes. Inflow is water other than wastewater that enters the sewer system through cross connections with storm drains, catch basins, roof drains, etc. Inflow can also occur through manhole covers.

Throughout most of the collections system, ground water levels are greater than 6.5 ft as mentioned in section 2.2.2. However, the groundwater depth in the south end of the Tetonia is very shallow. The sewer videos showed infiltration directly into the pipeline in the following pipe segments:

- Between MH-22 & MH-21 along Jorgensen St (Infiltration at Joint)
- Between MH-76 & MH-21 between Crestview Ln and Egbert Ave (Infiltration at Joint)
- Between MH-15 & MH-14 along Leigh Ave (Infiltration at service)

The first two pipe segments that are experiencing infiltration are located in the shallow groundwater areas, however the segment along Leigh Ave is located in an area with deeper groundwater levels. It is possible that groundwater levels in this area are high due to seasonal fluctuations.

One method for estimating infiltration is to compare winter wastewater flows against average wastewater flows. Since temperatures are typically below freezing during the winter months, there is likely little I&I entering into the system. It is reasonable to assume that average wastewater flows in excess of winter wastewater flows directly result from infiltration. However, the maximum flows in Tetonia were observed in February through April and in December as shown in Figure 2-13.

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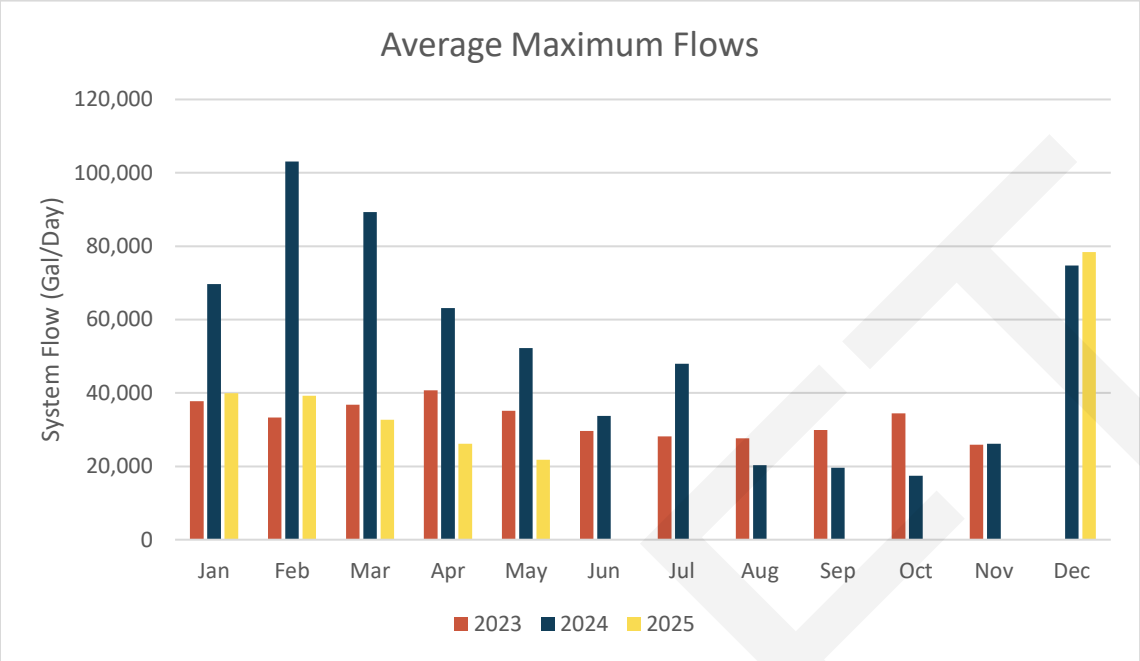

Figure 2-13 Maximum Daily Flows

In cities where temperatures are below freezing for most of the winter, many people leave the water in their homes running to prevent the pipes from freezing. It is possible this is the reason flows in the winter months are higher than during the rest of the year. The maximum and minimum temperatures for each month were retrieved from the Western Regional Climate Center and it appears that the winter months in Tetonia tend to be below freezing most of the time. Table 2-7 shows the average monthly maximum and minimum temperatures each month in Tetonia. The blue colored temperatures represent freezing temperatures less than 32 °F.

Table 2-7 Average Monthly High and Low Temperatures (Western Regional Climate Center, 1949-2026)

Average Max & Min Temperatures (°F)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	24	26	31	41	65	67	81	75	69	53	42	33
	7	5	12	19	38	41	48	47	41	30	22	14
2024	30	35	38	50	56	74	81	78	72	62	36	34
	14	17	17	27	30	44	48	46	42	32	18	18
2025	22	32	41	53	63	73	81	79	71	53	47	38
	2	14	21	26	36	42	48	48	40	30	26	22

The minimum temperatures were below freezing from January through May in 2024, which may have prompted many people to leave their water running during the day throughout these months.

Table 2-8 shows the ten highest flows from 2024 and 2025 with the recorded precipitation, maximum and minimum temperatures for these specific dates (NOAA, 2022 - 2026). The minimum temperature

was below freezing on 9 out of the 10 days, marked in light blue, which may be indication that people left their faucets on to prevent pipes from freezing, creating more flow on such cold days. Similar results were seen for the 10 highest flow in 2022 and 2023.

Table 2-8 Maximum Daily Flows (NOAA, 2022 - 2026)

Max Flow Dates (in 2024 & 2025)				
Date	Daily Flow (gpm)	Precipitation (in)	Max Temp (°F)	Min Temp (°F)
2/12/2024	71.6	0	27	17
2/15/2024	63.5	0.32	34	24
3/5/2024	62.0	0.12	23	6
3/7/2024	59.0	0.03	33	20
2/13/2024	57.5	0	28	19
2/14/2024	56.0	0.24	31	23
12/29/2025	54.4	0	17	-3
2/16/2024	52.9	0.55	35	24
12/2/2024	51.9	0	32	13
12/23/2025	51.4	0.05	44	33

Based on this observation, infiltration and inflow is not assumed to be a significant problem in the City of Tetonia during the times when it is most anticipated. However, based on the dry and wet weather flows determined in the previous section, flows during wet months are higher than during dry months. Table 2-9 shows the additional flow during the wet weather months in comparison to dry weather months. Since the average per capita wastewater flow rate during the wet weather months is less than 100 gpcd, the additional flow or I&I is very limited in Tetonia. Therefore, infiltration and inflow is not a concern in Tetonia.

Table 2-9 Additional Wet Weather Flow Calculations

Year	Dry Weather Flow (gpm)	Wet Weather Flow (gpm)	Difference between Dry & Wet Weather Flows		Wet Weather (gpcd)
			Flow	%	
2023	16	17	2	10%	60
2024	12	27	14	54%	90
2025	12	24	12	49%	79

2.4.5. Flow Reduction

The City of Tetonia does not discharge storm water into the sanitary sewer system. The average daily flows per capita are fairly minimal, with an average of 67 gpcd. When comparing the current flows to the previous 2005 Facilities Planning Study, it appears flows have not significantly increased even though the population has nearly doubled. This may be due to more efficient water fixtures etc. Therefore, high flows are not a concern in Tetonia. To reduce flows more in the future with a significant anticipation of increase in population, an important method of reducing flow is to repair leaks that allow I&I to enter the wastewater system. As the collection system grows or repairs are made, the new sections of the collection systems should be designed to minimize infiltration and inflow problems. The following steps may be taken to lessen the effects of I&I:

1. The City may consider completing a sewer system cleaning and video inspection to help inventory system deficiencies.
2. New collection system piping should be built with watertight, jointed PVC pipe. Service connections should be sealed with saddle type fittings.
3. Manholes should have watertight gasketed attachments to collection piping and watertight joints between manhole sections.
4. Manhole covers should be set with surrounding grading such that surface water runs away from the manhole.

Other ways to deduce flow entrail reducing culinary usage, which entails encouraging residents to use modern shower heads and low flow toilets. If monthly water bills were calculated on consumption rates, rather than mostly relying on flat monthly fees, it could reduce the amount of wastewater sent to the treatment lagoons. Using a tiered consumption structure that would charge users based on the amount of water they consume would encourage conservation. This in turn would result in less wastewater.

2.4.6. Flow Characteristics

During the previous lagoon construction project, completed in 20__, the design Biological Oxygen Demand (BOD) of the lagoon influent was ___ mg/L. This value will be used as the assumed BOD loading rate for this report and will be used in capacity calculations for the lagoons.

The IDEQ Reuse permit associated with the land application site for the lagoons requires monitoring of the lagoon effluent. This permit is included in Appendix ___. An annual reuse report for the land application site from 20__ includes additional information on the results of lagoon effluent sampling and testing. The reuse report is also included in Appendix __.

Find Influent Test Results

2.5. Existing Collection System

The original collection system was constructed in 1986 and it has been expanded and improved since then. The Tetonia sewer system consists of approximately 22,800 ft (4.32 miles) of 8" gravity sewer and approximately 100 ft of 4" and 6" pressure sewer piping that pumps directly into the treatment lagoon. The pipe network contains both concrete and PVC piping. The pipes are connected by Manholes, many of which are buried. The system has one 8" collector, which brings the flow from the entire City to the Lift Station. From there, it is pumped through a pressure line into Cell 1 of the Treatment Lagoons. The second lagoon is connected with a pipe on the southwest side of Cell 1. After the water is treated, it gets land applied after it is disinfected in a small chlorination building just west of the lagoons.

There are no storm drain systems that connect to the City's sanitary sewer system.

Record Drawings, along with the online City Sewer Map tool was used to develop the existing system map shown in Exhibit 3.

2.5.1. Pipelines

The sewer pipe materials include PVC and concrete pipe. The majority of the system is concrete pipe with a few newer segments that are PVC. There are some sections of pipe between manholes, in which the concrete pipe was repaired and replaced with PVC pipe (see Exhibit 8). The pressure main to the lagoons is made of ductile iron pipe. A summary of the pipe types, sizes, and estimated lengths is provided in Table 2-10.

Table 2-10 Pipe Summary

Material	Size	Total Length	% of Total System
PVC	8"	16,559	81.7%
Concrete	8"	2,926	14.4%
Concrete/PVC	8"	681	3.4%
Ductile Iron Pressure Main	4"	40	0.2%
	6"	65	0.3%
	Total	**20,270**	**100%**

In 2024, the City cleaned/flushed and performed a CCTV camera inspection on the entire sewer collection system to determine which segments of pipe need some work. Based on these videos, it was noticeable that a lot of manholes and the pipe inverts had rocks in them, most likely due to the buried manholes. The videos were analyzed based on structural criteria of the pipe as well as operational criteria. Structural criteria included cracking, deformation, sagging, joint defects, corrosion, condition of service, Infiltration & Inflow, and roots growth. The operational criteria

included debris/sediment, grease/FOG (Fats, Oils & Grease), and obstructions. Based on these criteria, each pipe was given a rating on from 1 to 5, 1 being minimal defects to 5 being most severe. Some sections of pipe had multiple defects, while others had none. A map showing the scoring of each pipe based on operational and structural criteria is shown in Exhibit 4 and Exhibit 5, respectively. The detailed rating table is also provided in Appendix __.

An 8-in sewer pipe, with a Manning's roughness coefficient of 0.013, laid at the minimum recommended slope of 0.40% should be able to pass 0.64 cfs to maintain fair capacity (70% depth/Diameter) and 0.38 to maintain good capacity (50% depth/Diameter) (See Appendix __ for Gravity Pipe Flow Capacity Calculations).

The d/D ratio is used to evaluate the capacity of a pipe during peak hour flows; it indicates how full the pipe is running during the peak hour event. It is calculated by dividing the depth of water flowing in the pipe (d) by the pipe's full internal diameter (D). A d/D ratio below 50% indicates good capacity, a ratio between 50% and 70% indicates fair capacity, and a ratio greater than 70% indicates that the pipe is operating out of capacity. With the 2025 peak hour flow for Tetonia of 82 gpm (0.18 cfs) conveyed through the single 8-in trunkline serving the entire collection system upstream of the lift station, and with the pipe laid at a 0.55% slope, the line has a d/D of 036, which is considered to have good capacity (see Appendix __).

Since the trunkline conveys the flows from the entire system, the remaining pipes also have good capacity with less flow, as long as there are no sages or damaged pipes. However, pipes with minimal flow and shallow slopes can often cause debris and sediment to build up because there is not enough flow to flush out the pipe. This occurs when the velocities in the pipe are below 2.0 ft/s to 2.5 ft/s. This problem was observed in the camera videos, as many pipes had a lot of debris and water built up/stagnant before the pipe was flushed. Based on record drawings from March 2010, there are four segments of pipe, totaling 1,112 LF, with slopes less than 0.40% for 8" pipelines (see Table 2-11 below).

Table 2-11 Pipelines Segments with Less than Minimum Slopes

Upstream MH	Downstream MH	Length of Pipe	Slope
MH-28	MH-27	363.49 ft	0.36%
MH-26	MH-25	369.52 ft	0.32%
MH-25	MH-24	177.30 ft	0.36%
MH-24	MH-23	201.90 ft	0.36%

2.5.2. Manholes

The collection system currently has approximately 83 manholes, which are shown in Exhibit 6. Manholes are needed to inspection, cleaning, and removal of obstruction in sewer lines. They must

be placed every 400 ft along a straight segment of pipe and at every angle point. Manholes also help with the ventilation of the sewer system, reducing the impact of H_2S gas.

The City does not have a good manhole inventory including inverts and depths. Due to many of the manholes being buried, rocks often get into the manhole. Two of the manhole lids are broken and some of the covers are not traffic rated. Some of the manholes also do not have any concrete collars around them. The depth of many manholes is an issue, as some are buried to high and others too low.

2.5.3. Lift Station & Force Main

The location of the City's lift station is shown on Figure 2-14 and in Exhibit 3. The lift station was last inspected in September of 2025. The following information was taken from the inspection report titled "Annual Report for Sewer Lagoon, Wastewater Lift Station" and dated 09/24/2025.

The lift station has a 96-in inside diameter, 194-in deep concrete wet well (including the lid) from which wastewater is pumped to the treatment lagoons. The lift station utilized two submersible Hydromatic pumps that operate based on float switches which respond to changes to the water level in the wet well. The float switches (Hydroranger level controller) allow the two pumps to alternate operating within each pump cycle to encourage equal operation time and wear. The level sensor is held in place on a section of PVC conduit. The control panel to the pumps is located inside the control building. The lift station has a rectangular aluminum hatch/lid. A rail system (Hydromatic M.T.M. Style rail system) is installed inside the lift station to guide the pumps when they need to be taken out for inspection, cleaning, or replacement (shown in Figure 2-15). The pumps discharge to a 4" ductile iron force main (one line for each pump) that go to a dry well with a check valve and gate valve on each pipe, where the two lines are combined with a tee and another valve. From there, the wastewater flows through a flow meter which is located inside the control building before it goes to a tee which upsizes the line to a 6" and gets pumped to the treatment lagoon. A 6" gate valve is located on each side of the tee. One gate valve is always closed and is piped for future lagoons north of the control building. The control building also houses a generator for backup power to the pumps. The lift station characteristics are summarized as follows:

- Inside Lift Station Diameter = 96"
- Wet Well depth (including lid) = 194"
- Inlet Pipe Diameter = 8"
- Inlet Invert = 6021.20 ft
- Outlet Pipe Diameter = 4"
- Lead Pump ON = 6.00 ft
- Lag Pump ON = 6.900 ft
- Pumps OFF = 2.100 ft
- High Water ON = 7.000'

Pump 1 was last replaced with a similar pump in the Fall of 2025. Before the pump was replaced, the annual report revealed that the pumping rate of Pump 1 was between 352 gpm and 378 gpm and

Pump 2 was between 314 gpm and 385 gpm. (*Note that the report did not take into consideration the continuous influent flow during the pump test, therefore 17.4 gpm was subtracted from this test to obtain these pumping rates. An influent flow of 17.4 gpm was estimated by averaging the two drawdown tests that the Operators performed at two different days and times.)* The model and serial numbers from the report were used to obtain the pump curves directly from the pump manufacturer. The pump curves listed the design flow of the pumps at 363 gpm, which was used as the assumed pumping rate when determining the system flows. Based on the pump curves, the pumps currently operate within this general range. A summary of the pump information is shown in Table 2-12 and the pump curve is provided in Appendix __.

Table 2-12 Lift Station Pump Summary

Pump Criteria	LS Pump #1	LS Pump #2
Manufacturer	Hydromatic	Hydromatic
Model Number	S4NX500FC	S4NX500FC
Serial Number	S84785	S84783
Horsepower	5 hp	5 hp
RPM	1800 rpm	1800 rpm
Impeller Trim	7.12"	7.12"
Rating	460 volts A.C. 3phs	462 volts A.C. 3phs
Design Flow	363.3 gpm	363.3 gpm
Design Head	32.66 ft	32.66 ft

The pump design operating point of 363 gpm is sufficient to produce a wastewater velocity in the 4" force main of 9.3 ft/s and 4.1 ft/s in the 6" force main, which meets the State's recommended cleansing velocity of 2 ft/s. It is also recommended not to exceed a velocity of 8 ft/s to limit the headlosses and ensure the pump operates efficiently.

The annual report reported that the flow meter is reading inaccurately and is reporting nearly 100 gpm higher than what is actually flowing through the pipeline.

Lift Station record drawings were not available, but a general flow schematic from the lift station, through the control building is included in Appendix __. Figure 2-14 to Figure 2-18 show the lift station and inside the Control Building.

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Figure 2-14 Lift Station

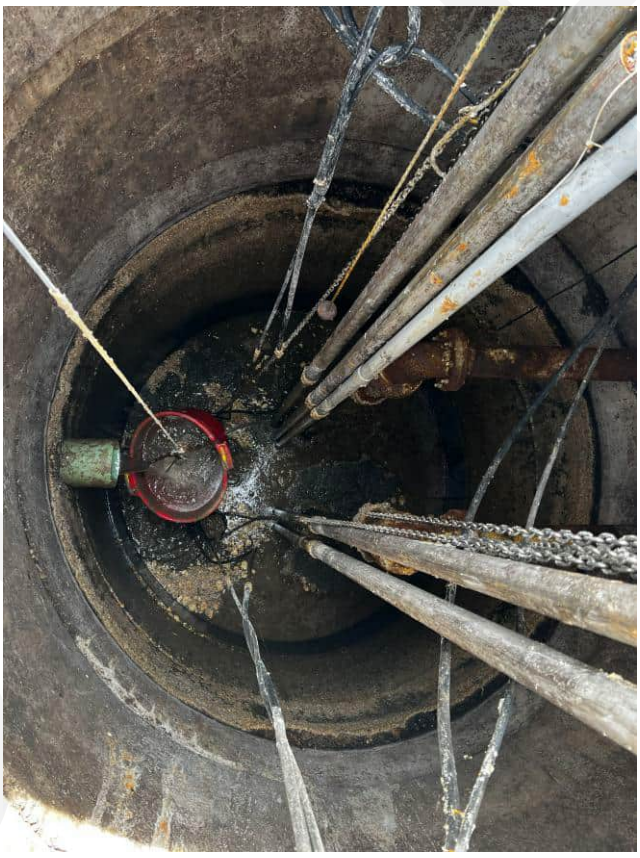

Figure 2-15 Guide Rail System inside Lift Station Wet Well



Figure 2-16 Generator inside Control Building



Figure 2-17 Control Panel for Lift Station Pumps (in Control Building)



Figure 2-18 Flow Meter in Control Building

Capacity of Wet Well

Section 42.62 of the Ten-State Standards specifies that a wet well should be sized to provide a minimum of 30 minutes of storage based on the average daily influent flow (Ten-State-Standards, 2014, pp. 40-5). With a current system ADF of 21 gpm, the required storage volume for the existing lift station wet well is 618 gallons.

Record drawings indicate that the bottom 1'-2" of the wet well has sloped sides, which reduces usable storage volume. Because the submersible pump is also located within this portion of the wet well, it is considered dead storage and is excluded from the available storage calculation.

Available storage is measured from the elevation at which the pump is set to activate, which is 6.0 ft. Based on this operating depth, the existing wet well provides 1,817 gallons of available storage, which exceeds the required 618 gallons and is therefore adequate. Calculations are included in Appendix __.

It should be noted that oversized lift stations can contribute to odor issues, as the increased storage volume allows wastewater to remain in the wet well for extended periods of time.

2.5.4. Unconnected Systems

There is one septic system for a single residence within City Limits, located at the southeast edge of City Limits along US Highway 33 (at [address redacted]33). A single residence within 1,0000 ft of city limits must be connected to the City System per Idaho DEQ. There are no other significantly developed areas served by septic systems or unconventional systems.

2.5.5. Combined Sewer System

The City of Tetonia operates and maintains their own sanitary sewer system and does not share with any other entities. There are no other cities or entities within close proximity to Tetonia to combine the sewer system with.

2.6. Existing Treatment System

The City of Tetonia Reuse System is considered a Class I treatment system. The wastewater is collected at the lift station, where it is pumped through the dry well, through flow meter in the control building inside the meter pit into the division structure located on the north side of Lagoon Cell 1. The wastewater is treated as it moves from the inlet pipe to the outlet pipe in Cell 1. The outlet pipe is connected to Lagoon Cell 2 with a pipe and diversion structure. Cell 2 is mostly used for storage. The drain pipe of Cell 2 is connected to another diversion structure, which directs the treated water towards the disinfection building, located on the northwest corner of Cell 2. The water goes through a flowmeter and then gets pumped to the land application site after being chlorinated with liquid chlorine via a chlorine injection pump. A schematic of the system is shown in Figure 2-19. The wastewater treatment facility appears to be well maintained. The roadway widths are adequate for travel; erosion of the banks is not evident.

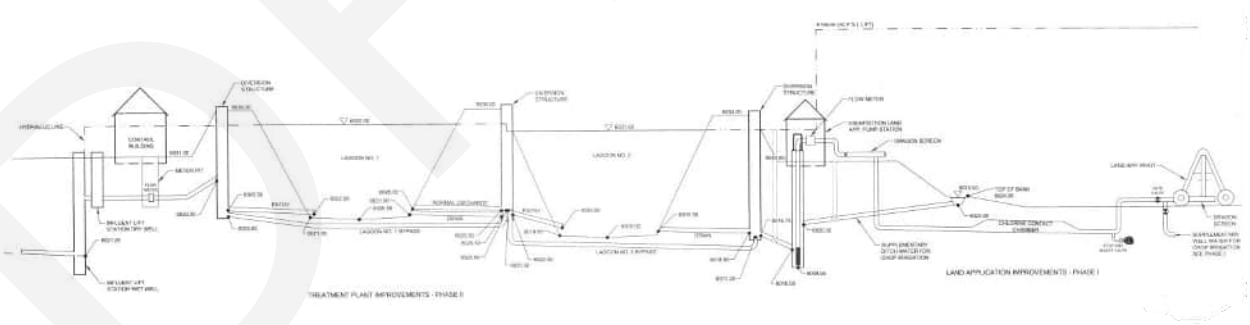

Figure 2-19 Schematic Diagram of Treatment System

2.6.1. Treatment Lagoons

Wastewater is treated in aerated treatment lagoons, which are located approximately half a mile west of the City of Tetonia. The lift station is located just northeast of the lagoons as shown in Exhibit 3 and in the Record Drawings attached in Appendix ___.

Two independent cells are used to treat wastewater. Cell 1 is primarily used for treatment (Figure 2-20), and Cell 2 is used as storage (Figure 2-21). Lagoon Cell 1 was initially constructed in ___ and it was rehabilitated when Cell 2 was constructed in 2010. Both lagoons have a 60-mil HDPE liner. Lagoon Cell 1 has two aerators which help increase treatment (see Figure 2-22). The following information is known for the aerators, and a product sheet is included in Appendix ___:

- Manufacturer and Style: Newterra Aspirator/Aerator
- Motor: 5 hp
- Oxygen Transfer per Aerator: 1.8 lb of O_2/hp*hr
    - With a 5 hp motor, Oxygen Transfer per Aerator = 9.0 lb O_2/hr



Figure 2-20 Treatment Lagoon Cell 1



Figure 2-21 Storage Lagoon Cell 2



Figure 2-22 Aerators in Lagoon Cell 1

Table 2-13 contains a summary analysis of the existing lagoon system. The results were generated from a review of available construction drawings and aerial photography and should be considered approximate.

Table 2-13 Lagoon System Summary

Lagoon	Volume (MG)	Surface Area (ac)	Max Depth (ft)	Slope (H:V)	HWL[4] (ft)	Top of Bank Elev. (ft)	Lagoon Center Elev. (ft)	Main Use
Cell 1	5.135	1.75	12.5	3:1	6033.0	6036.0	6020.5	Treatment (by aeration)
Cell 2	9.656	3.05	12.5	3:1	6031.5	6034.5	6019.0	Storage

2.6.1.1.Seepage Testing

The lagoons were last seepage tested in August of 2020 by Keller Associates. The allowable seepage rate is dependent on the time of construction. If constructed after April 15, 2007 a maximum seepage rate of 0.125-in is allowed (per IDAPA 58.01.16.493.03). Since both cells were constructed or rehabilitated after this date, the maximum allowable seepage rate is 0.125-in. Based on the Seepage Test Report, Cell 1 yielded a seepage rate of 0.070 in/day and Cell 2 yielded a seepage rate of 0.071 in/day. Therefore, both cells passed and seepage is not a concern.

2.6.2. Diversion Structures

Three diversion/transfer structures are located around the treatment lagoons (see Exhibit 7). Diversion structure #1 is located on the north side of Lagoon Cell 1, where the water that is pumped from the Lift Station flows into. Diversion Structure #2 is located between the two cells, on the southeast side of Lagoon Cell 2. This structure connects the treatment cell to the storage cell. Structure #2 is located at the outlet of the winter storage lagoon, which gravity feeds to the chlorination/disinfection building. This diversion structure is located on the northwest corner of Cell 2. Diversion structures #1 and #2 and diversion structures #2 and #3 are connected with bypass piping for isolation and for overflow. The invert elevations of each transfer structure are listed below:

- Diversion Structure #1:
  - Inlet = 6028.00 ft
  - Outlet = 6022.50 ft

[4] HWL = High Water Level

    - Lagoon #1 Bypass Outlet = 6028.00 ft
- Diversion Structure #2:
    - Inlet = 6020.50 ft
    - Outlet = 6020.50 ft
    - Lagoon #1 Bypass Inlet = 6025.50 ft
    - Lagoon #2 Bypass Outlet = 6025.50 ft
- Diversion Structure #3:
    - Inlet = 6018.50 ft
    - Outlet = 6016.75 ft
    - Lagoon #2 Bypass Inlet = 6017.25 ft



Figure 2-23 Diversion Structure #1

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Figure 2-24 Diversion Structure #2



Figure 2-25 Diversion Structure #3

2.6.3. Land Application

Between April and October, the system is allowed to land apply chlorinated wastewater. During the winter months, November to March, wastewater is stored in the Storage Lagoon (Cell 2) until the system is allowed to land-apply again. The land application program is permitted under IDEQ reuse permit M-208-03, which has been extended until a new permit is issued (see Appendix _). Until a new permit is issued, the City must comply with all the monitoring and reporting requirements of this permit. The reuse permit allows the city to land-apply effluent from the lagoons onto a 29.3-acre slow rate 638-ft long center pivot with end gun use in the corners (Figure 2-26). The quantity of water permitted for reuse is 45.208 MG per year for alfalfa/grass mix onto a maximum area of 42 acres. The land application site also has an alternate well source to provide water if there was a time when there was not enough recycled water available from the lagoons. Exhibit 7 shows the overview of the Land Application site and its piping.



Figure 2-26 Land Application Site – Center Pivot

Annual reports are required for the permit, to provide the findings from lab analysis of the constituent monitoring of the recycled and supplemental irrigation water, as well as flow monitoring of these water sources. The report also needs to include ground water monitoring data as well as soil and crop monitoring information. Table 2-14 shows an overview of the permit limits and conditions:

Table 2-14 IDEQ Reuse Permit Limits and Conditions Overview

Description	Condition/Limit
Hydraulic Management: Maximum Acres Allowed (ac)	42
Hydraulic Loading Limit: During the Growing Season (MG/Year)	45.208
Constituent Loading Limits: Nitrogen (lb/ac)	150% of typical crop uptake

Description	Condition/Limit
Management Unit Buffer Distances:	
Public Water Supplies (ft)	1,000
Private Water Supplies (ft)	500
Inhabited Dwellings (ft)	300
Permanent and Intermittent Surface Water (ft)	100
Irrigation Ditches and Canals (ft)	50
Acres Accessible to Public (ft)	0
Growing Season:	Apr 1 to Oct 31 (214 days)
Nongrowing Season:	Nov 1 to Mar 31 (151 days)
Reporting year for annual loading rates:	Jan 1 to Dec 31
Operator Certification:	Licensed in Idaho
Disinfection Limits:	Class C
Median Number of total coliform organisms (organisms/100mL)	23
Maximum Total Coliform (organisms/100mL)	230
Crop/Vegetation allowed:	See IDAPA 58.01.17 Section 602.02 Table 3 (Class C)
Grazing	Not Allowed
Posting of "Warning: Recycled Water – Don Not Enter" signs:	Every 500' & at each corner (in English & Spanish)
Fencing:	3-wire pasture fence around perimeter
Construction Plans:	Must be submitted to DEQ prior to any work
Backflow Preventing:	Required
Records Retention:	Keep records for duration of this permit + 2 years

Before the recycled water gets applied on the pivot, the effluent from the lagoons is disinfected in the Chlorination building (Figure 2-27). The chlorination building houses a vertical turbine pump that pumps the water to the pivot as well as a flow meter (Figure 2-28), to measure the volume that is being sent to the pivot, as well as a chlorine injection pump. A "Danger Chlorine" sign is posted on the front of the door that houses the tanks filled with liquid chlorine (Figure 2-29). The nearby ditch is connected to the pump so that water from the ditch can be used to irrigate the crop in the event that there is not enough water from the lagoons. After the water is pumped and disinfected inside the chlorination building, it gets sent through a dragon screen and a chlorine contact chamber before it goes to the pivot. The dragon screen also has a spigot to take water samples from.



Figure 2-27 Chlorine Building



Figure 2-28 Vertical Turbine Pump and Flow Meter



Figure 2-29 Liquid Chlorine Storage Tanks

Groundwater Monitoring Wells

Four Groundwater (GW) monitoring wells are located around the land application and lagoon site. The 'East Well', which is considered 'GW Monitoring Well #1' (Figure 2-30), is located on the northeast side of the treatment lagoon. This well is upgradient of the land application site. GW Well #2 is located on the northwest corner of the winter storage lagoon, also upgradient of the land application site, but is not listed in the Reuse Permit. The 'Southwest Well' (GW Monitoring Well #3) (Figure 2-31) and 'Northwest Well' (GW Monitoring Well #4) (Figure 2-32) are both located downgradient of the pivot. A picture of Monitoring Well #2 was not taken at the site visit, and therefore not shown below. The location of the four groundwater monitoring wells is shown in Exhibit 7.

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Figure 2-30 East Well (GW-208-01)



Figure 2-31 SW Well (GW-208-03)



Figure 2-32 NW Well (GW-208-04)

2.7. Treatment Facility Capacity

The treatment was also analyzed to determine capacity. The following components were considered in the analysis of the treatment system:

1. Flow Capacity – Minimum Number of Cells Required per Idaho Standards
2. Water Balance – Volume, the ability of the system to store wastewater during non-discharging months.
3. Oxygen Supply and Demand of the Treatment Cell (Cell 1) – Biological treatment to determine the excess capacity to meet the biological oxygen demand and nitrogenous oxygen demand.
4. Hydraulic Detention time of the system – the amount of time wastewater is treated for in the treatment Cell.

2.7.1. Flow Capacity

According to IDAPA 58.01.16.493.08.a, wastewater treatment pond systems must have a minimum of three cells designed to operate both in series and parallel, unless the system flow is less than 50,000 gallons per day.

Based on average daily system flows of 29,682 gal/day, the system is currently adequate with only two cells.

2.7.2. Water Balance (Hydraulic Balance)

A water balance is performed to analyze the storage capacity of the lagoons between discharge months. Water balance calculations are based on the law of conservation; all water entering the system from the City sewer collection system (influent) must leave the system at some point. Water leaves the system discharge to the land application site (effluent). Water can also enter the system via precipitation and leave the system through evaporation and seepage.

Seepage, evaporation, and precipitation can be estimated using historical weather data from nearby stations and by seepage testing at the treatment facility (Western Regional Climate Center). Average precipitation for Tetonia based on the Tetonia Experiment station (109065) is 18.10 in/year (Western Regional Climate Center, 1949-2026). The average pan evaporation rate is 27.62 in/year after applying a correction factor of 0.8 to 34.53 in/year from closest available pan evaporation data from the Rexburg Ricks College weather station (107644) located approximately 30-miles west of Tetonia (Western Regional Climate Center, 1977-2005). The average seepage rate for Lagoon Cell 1 was 0.070 in/day (25.55 in/year), and the seepage rate for Cell 2 was 0.071 in/day (25.915 in/year) as reported in the 2020 Seepage Test Report. Lagoon Cell 1 has a surface area of 1.75 ac and Cell 2 has an area of 3.05 ac, making the total area of the lagoons 4.80 ac.

The following equations were used to determine the additional annul flow beyond the collection systems influent:

$$ESP = Evaporation + Seepage - Precipitation$$

$$= 27.62\frac{in}{year} + (25.55 + 25.915)\frac{in}{year} - 18.10\frac{in}{year} = 60.985\ in/year$$

Converting this to MG/day:

$$60.985\frac{in}{year} * 4.80\ ac * \frac{43{,}560\ ft^2}{1\ ac} * \frac{1\ ft}{12\ in} * \frac{7.48\ gal}{1\ ft^3} * \frac{1\ year}{365\ days} = 21{,}776\frac{gal}{day} = 0.022\frac{MG}{day}$$
$$= 7.948\ MG/year$$

However, due to Evaporation, Seepage and Precipitation being fairly minimal, it is more conservative to exclude this from the effluent volume. Note that the average seepage rate determined in the Keller Report revealed a negative value when 100% of evaporation was used. Therefore, the Keller report used a 50% evaporation rate instead, which revealed a positive number. This shows that seepage is negligible and if this value were taken out of the ESP equation, there would only be an additional 1.24 MG/year to account for. Therefore, the ESP was not included in the water balance determination and not further evaluated for the purposes of this study.

Influent flow data is recorded on a daily basis throughout the year. Per the discharge permit, the system can discharge up to 45.208 MG/year (211,252 gal/day) over 42 acres during the growing season, which consists of 214 days. The existing land application site has a 638 ft long pivot arm, which is equivalent to a total area of 29.4 acres. Based on this area, the maximum allowed discharge is 31.599 MG/year. Using the inflow data and discharge limit, the lagoon capacity can be analyzed as follows:

Influent Volume: 10.834 MG/year (21 gpm ADF from Section 2.4)

Effluent Volume: 31.599 MG/year (limits per Reuse Permit)

System Capacity based on Water Balance:

$$Influent - Effluent = 10.834\frac{MG}{year} - 31.599\frac{MG}{Year} = -20.765\frac{MG}{Year} = -0.057\frac{MG}{day}$$
$$= 386\ Additional\ ERUs\ > 0\ Additional\ ERUs\ (OK)$$

In summary, the system has the capacity to handle an additional 0.057 MG per day. With an ERU being equivalent to 0.10 gpm (148 gpd), the system has the capacity for an additional 386 ERUs based on water balance. The system is capable of handling a total of 587 ERUs from a water balance analysis (which is equivalent to a System ADF = 60 gpm). A summary of the water balance calculations is provided in Appendix __.

Based on the 2024 and 2025 Land App Report by Jared D Gunderson, a total of 18.238 MG and 26.882 MG of wastewater was applied during the growing season, respectively. This includes water from the wastewater plant as well as supplemental irrigation water. Using effluent volumes of 18.238 MG/year and 26.882 MG/year, the system is shown to have remaining capacity of only 0.020 MG/day (137 ERUs using 2024 applied water) and 0.044 MG/day (298 ERUs using 2025 applied water)."

Additional factors that could affect the water balance calculation include the amount of evaporation during the year, the sludge build up that reduces capacity and seepage, and the overall lagoon depth in the month of discharge.

2.7.3. Oxygen Supply & Demand

BOD & Nitrogen Loading

Oxygen demand was evaluated based on BOD and nitrogenous oxygen demand (NOD), with NOD derived from influent TKN. In aerated lagoons, aerators provide mixing and oxygen transfer to support biological treatment. The Ten State Standards (Section 92.331) state that oxygen demand is a function of influent BOD and NOD. The following equation was utilized to determine the oxygen demand for the aerated lagoon (Ten-State-Standards, 2014, pp. 90-9 to 90-10):

$$O_2\ Demand\ = (1.5 * BOD\ Loading) + (4.6 * NOD\ Loading)$$

The influent was sampled at the Lift Station and the effluent sample was taken at the transfer station between the two lagoon cells in March, 2026. The sample of influent BOD waste loading was recorded at 194 mg/L and the effluent BOD loading was 116 mg/L, resulting in a 40% removal rate. Aerated lagoons are typically designed to remove 85% of the BOD. Low temperatures have a negative effect on the BOD removal efficiency. A typical residential BOD concentration varies from 155 to 286 mg/L per Table 3-7 of the EPAs Onsite Wastewater Treatment System Manual (U.S. Environmental Protection Agency, 2002). With an influent BOD reading of 194 mg/L, this is within the typical range.

Influent Ammonia as N was measured at 43.92 mg/L and the effluent was 33.29 mg/L. The Ten-State Standards recommends using 4.6 times the influent TKN (Total Kjeldahl Nitrogen), which includes organic nitrogen plus free ammonia. Because TKN data were not available for this system, influent TKN was estimated from Ammonia as N using a multiplication factor[5] of 1.56, based on ammonia typically comprising 60-64% of TKN (Metcalf & Eddy Inc., 2003, p. 186). The upper-end estimate was selected to better reflect Tetonia's relatively concentrated wastewater conditions (low per-capita flow). Using this approach, the estimated influent TKN is approximately 69 mg/L.

Loading rates are calculated as follows and also included in Appendix ___:

$$Loading = Q\ (MGD) * Influent\ BOD\ or\ TKN\ \left(\frac{mg}{L}\right) * 8.34$$

Where,

Q	=	System ADF
BOD or TKN	=	Influent concentration of BOD or TKN where TKN is taken as: (Ammonia as N) * 1.56
8.34	=	Conversion Factor to convert to lb/day which is calculated as follows:

$$\frac{1{,}000{,}000\ gal}{1\ MG} * \frac{3.785\ L}{1\ gal} * \frac{1\ lb}{453{,}592\ mg} = \frac{3{,}785{,}000}{453{,}592} = 8.34\frac{lb}{MG * mg/L}$$

The analysis of biologic capacity was conducted on Cell 1 only because that is where the main biological treatment takes place. Cell 2 is mostly considered as a storage lagoon. Assuming an influent BOD level of 194 mg/L, the current BOD loading is 48 lb/day. With an influent Nitrogen level of 69 mg/L, the current NOD Loading is 17 lb/day.

[5] Multiplication Factor = 1 / 0.64 = 1.56

Oxygen Demand

To obtain the oxygen demand, the following equation was used (Ten-State-Standards, 2014, pp. 90-9 to 90-10):

$$O_2\ Demand = (1.5 * Influent\ BOD\ Loading) + (4.6 * Influent\ NOD\ Loading)$$
$$= \left(1.5 * 48 \frac{lb\ BOD}{day}\right) + \left(17 \frac{lb\ TKN}{day}\right) = 150\ lb\ O_2/day$$

Based on the loadings determined previously, the Oxygen demand of the system is currently 150 lb O_2/day.

Oxygen Supply

Since the treatment lagoon is aerated, oxygen supply was estimated using manufacturer-provided aerator specifications. As discussed in Section 2.6.1, each aerator transfers 9.0 lbs of O_2 per hour, which is equivalent to 216 lbs of O_2 per day.

Although Cell 1 has two aerators, firm capacity was evaluated assuming one aerator is out of service. Therefore, the oxygen supply is currently 216 lbs of O_2 per day, which exceeds the estimated oxygen demand of 150 lbs of O_2 per day. Therefore, the existing aerators supply adequate oxygen to meet current BOD and NOD treatment requirements. These calculations are provided in Appendix __.

2.7.4. Hydraulic Detention Time

The hydraulic detention time for the system was only calculated for the treatment lagoon (Cell 1). Detention time is not applicable to Cell 2 because it is used as a storage cell to contain the treated wastewater for the five-month period between discharges. The required detention time is determined by the following equation (Ten-State-Standards, 2014, pp. 90-20):

$$t = \frac{E}{2.3k_1 * (100 - E)}$$

Where,

t = hydraulic detention time, days

E = percent of BOD_5 to be removed in an aerated cell

k_1 = reaction coefficient, aerated pond, base 10. For normal domestic wastewater, k1 is assumed to be 0.12/day at 68 °F and 0.06/day at 34 °F. (Since Tetonia is considered to have colder climates -> use 0.06.day).

The Reuse permit does not list an allowable BOD level; Aerated treatment lagoons are typically designed to treat 85% of the BOD_5. Using the equation above, it was calculated that the required hydraulic retention time is 41 days.

The detention time of the system is a function of influent flow rate and cell volume. The total volume of Cell 1 is 5.135 MG and currently, the average influent flow rate is 21 gpm (29,682 gal/day). Detention time is calculated as follows:

$$Detention\ Time = \frac{Lagoon\ Volume\ (gal)}{ADF\ \left(\frac{gal}{day}\right)} = \frac{5{,}135{,}000\ gal}{29{,}682\ gpd} = 173\ days > 41\ days\ (OK)$$

Since the actual detention time is greater than 41 days, the size of the treatment lagoon is sufficient. More detention time allows for more treatment to occur.

2.8. Winter Storage Capacity

The winter storage lagoon (Cell 2) provides storage of treated wastewater during the time that it cannot be land applied. The non-growing season per the Reuse Permit is between November 1st and March 31st. During this 151 day period, the treated water remains in the storage lagoon. Therefore, the lagoon must be sized appropriately in order to have sufficient capacity for this season. Therefore, the storage time was determined similarly as the detention time of the treatment lagoon. The total volume of Cell 2 is 9.656 MG and the current average influent flow rate is 21 gpm (29,682 gal/day). Storage time is calculated as follows:

$$Storage\ Time = \frac{Lagoon\ Volume\ (gal)}{ADF\ \left(\frac{gal}{day}\right)} = \frac{9{,}656{,}000\ gal}{29{,}682\ gpd} = 325\ days > 151\ days\ (OK)$$

Therefore, the current storage capacity is sufficient to serve the community, as the volume of Cell 2 allows for 325 days of storage, which is more than twice as long as the non-growing season.

2.9. Violations

The Seepage test report showed that the seepage rates of each lagoon were well under the allowable limit, therefore not violating the seepage rate requirements.

The 2024 Land Application Report stated that the chlorine injection wasn't working correctly. The piping system and injection port were plugged with deposits, causing challenges. This resulted in violations, which were recorded to DEQ.

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The 2025 Land Application Report stated that total coliform was exceeded three times in July, with readings greater than 2,419.2 MPN/100 mL. This was caused by the motor of the chlorine dosage pump shorting out. As a result, the City replaced the motor and the test results have been within a good range since.

The City of Tetonia was not listed in the 'Eighth Annual Idaho Wastewater Treatment Plant Report' as having any violations in 2024 (Idaho Conservation League, 2025).

2.10. Sewer Model

The sewer model was developed using the GIS based software Aquatwin by Aquanuity. The model used the following sources to develop the work for the hydraulic model:

- City of Tetonia GIS wastewater system data retrieved from Diamond Maps
- Mapping details taken from 2005 Wastewater Facility Planning Study by Schiess & Associates Consulting Engineers
- Pipe flow directions, sizes, and lengths from CCTV Sewer Videos
- City of Tetonia as-built drawings
- City of Tetonia SCADA system
- City staff knowledge

Sewer flows were modeled using the flow data as shown in Section 2.4.3 of this report. Sewer service locations were mapped based on service addresses provided by City personnel and individual flows were assigned based on the number of ERUs, which were determined using the table in the Sewer Fee Resolution. Each node was given an average day flow of 0.10 gpm per ERU and a maximum day flow of 0.36 per ERU. Some connections, particularly commercial ones, consume more water and are therefore assigned multiple ERUs.

2.10.1. Flow Builder

Flows were assigned directly to the address nodes within the system. The "Inflow Builder" was used to assign flows to these nodes, based on the number of ERUs, which were determined using a list of services that was provided by the City. These were then mapped to the closest pipe to assign combined flows as shown in Figure 2-33. All future flows were assigned to the manhole named 'Future-2.'

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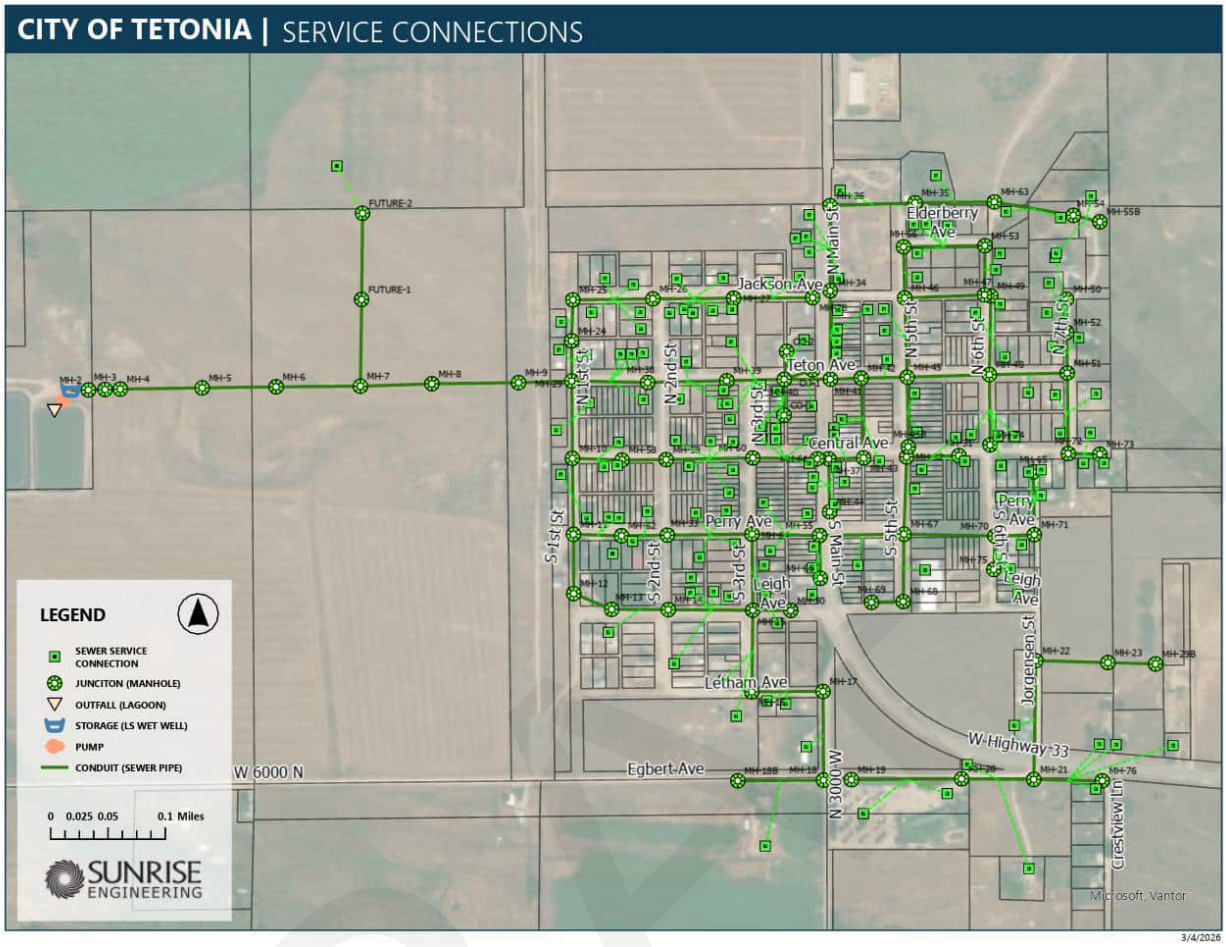

Figure 2-33 Inflow Builder – Service Connections Overview

2.10.2. Model Attributes

Pipe, manhole, lift station, and pump attributes, settings, and elevation data came from as-built drawings and City staff knowledge. Record Drawings were not available for most of the piping within the collection system, therefore a minimum slope of 0.40% was assumed throughout the system. The following inputs were used to set up the model and the model setup is shown in Figure 2-34.

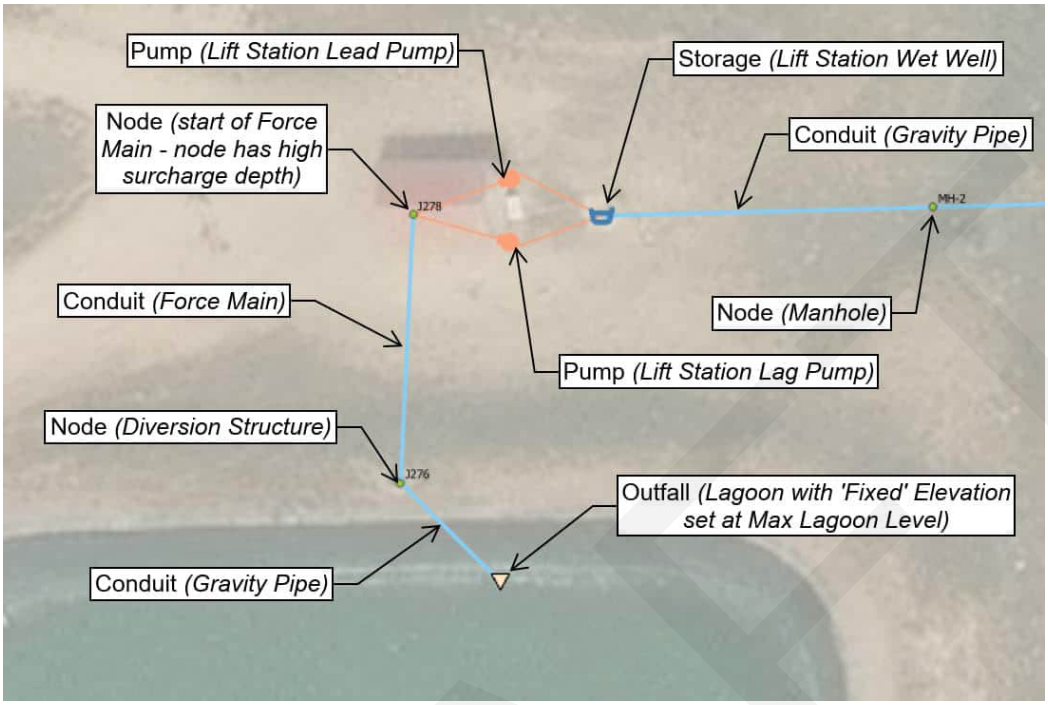

Figure 2-34 Model Setup Overview

2.10.2.1. Storage (Lift Station)

The Lift Station Wet Well was modeled as a storage node, which was connected by a pipe from MH-02. A pump was then placed directly from the storage node to the 'outfall' node, which represents the lagoon. The attributes were assigned to the Lift Station:

- Lift Station Wet Well was modeled as a 'Storage' node with the following criteria:
  - Invert Elev. (Bottom of Wet Well) = 6014.0 ft
  - Maximum Depth (of Wet Well) = 16.0 ft
  - Rim Elev. (of Wet Well) = 6030.0 ft
  - Initial Depth = 2.0 ft
  - Shape = Cylindrical with an 8 ft diameter
- Invert Elevation of inlet pipe into the LS was modeled using the incoming pipe with:
  - Offset of outlet = 6.9 ft -> resulting is LS Inlet Elev. = 6020.9 ft

2.10.2.2. Junctions (Manholes)

"Junctions" in the model represent manholes, which are located in any places where the direction of flow changes or the pipe length exceeds 400 ft.

Rim and Invert elevations were not available for this system. For this reason, Rim elevations were set using the "Elevation Extractor" tool using the 2m DEM elevation data from LIDAR data. A minimum pipe slope of 0.40% was used to map the system. An overview map of all junctions (Manholes) in the collection system (for current and future scenarios) is shown in Exhibit 6.

The node directly downstream of the lift station pumps was set up as a node having a very large surcharge depth (1000 ft) as this node is the start of the force main pipe.

2.10.2.3. Conduits (Pipes)

Nominal pipe sizes were used for the pipe attributes. In other words, the inside diameter for an 8-inch pipe was set at 8.0 inches. For concrete pipes, the inside diameter is usually representative of the 'pipe diameter'. PVC pipes typically have a slightly smaller inside diameter than their 'pipe size', but since the majority of the system (approximately 82%) are concrete, all pipes were assigned their size based on nominal pipe diameters.

The Mannings roughness coefficient for Concrete and PVC pipes was assumed to be the same for all pipes. Typical values for concrete pipe is 0.013 and 0.009 to 0.011 for PVC. Since the majority of pipelines in the collection system are made of Concrete, all pipes were assigned the same roughness coefficient of 0.013.

The pressure pipe between the lift station and Diversion Structure #1 was set up as a "Force Main" pipe, having a maximum depth (diameter) of 6". When the force main flows under full-pipe conditions, the model applies the Hazen-Williams equation rather than the Manning's equation. Therefore, a Hazen Williams Coefficient of 140 was assigned to this pipe under 'Parameter 2', which is a typical value for ductile iron pipe.

2.10.2.4. Pumps (Lift Station Pump)

The lift station pumps were only modeled as a single pump, since only one pump should be running at all times. The current as well as the 20-year and 40-year future peak hour flow rates are less than the peak hour flows, only a single pump should have to run. The pump was pump was drawn directly from the 'Storage' to the 'Outfall' node, having the following settings:

- Pump Curve with the following data points:

Head (ft)	Flow (gpm)
0	49
50	44.6
100	41.9

150	40.2
200	39.1
250	37.5
300	35.8
363.3[6]	32.66[6]
400	30.5
450	27.2
500	23.8
550	21.1

- Lead Pump:
  - Initial Status = OFF
  - Shutoff Depth = 2.10 ft
  - Startup Depth = 6.00 ft
- Lag Pump:
  - Initial Status = OFF
  - Shutoff Depth = 2.10 ft
  - Startup Depth = 6.90 ft

2.10.2.5. Outfall (Lagoon)

Since the Lift Station pumps directly into the Lagoon Cell 1, the lagoon was assigned as an 'outfall' in the model with the following criteria:

- 'Fixed' outlet
- No tide gate
- Invert Elev. = 6022.5 ft
- Fixed Stage = 6033.0 ft (This represents the maximum Water Elevation in Cell 1)

2.10.3. Model Output

The maps that were created to show the output data are shown in Exhibit 9 to Exhibit 12. Tabular output results for each pipe along with graphs of various system components including flows of pumps and outfall are provided in Appendix __.

The average day flows were utilized to determine velocities through the pipes. It is recommended to have velocities through sewer pipes of at least 2 ft/s and velocities should not exceed 8 ft/s. However, due to Record Drawings being unavailable, the slopes were set to minimum slopes of 0.40%, which

[6] This represents the design point of the pump.

could contribute to slower velocities if the actual slope is steeper. Based on the total inflow at the outfall, the average day data was also analyzed to determine how often the pump had to turn on to pump the water out.

Peak hour flows were evaluated to determine the maximum d/D ratios. The ratio indicates how full the pipe flows during the peak hour flows. The d/D is determined by dividing the depth of the water running through the pipe (d) by the full depth of the pipe (D). Pipes with a d/D ratio of less than 50% are considered good capacity, between 50 and 70% fair capacity, and greater than 70% is considered out of capacity.

2.10.3.1. Existing (2025) Average Day Flow

The sewer model was run for multiple scenarios, starting with an Average Day Flow (ADF) to determine if there were any areas in the system where maximum pressures exceeded 100 psi in the current system. Pressures exceeded 100 psi in three areas of town, as shown in the map titled "Existing Average Day Demand – Maximum Pressures." Since pressures should be 80 psi or lower, an alternative to address this issue is discussed in Section Error! Reference s ource not found..

2.10.3.2. Existing (2025) Peak Hour Flow

A Peak Hour Flow (PHF) scenario was modeled for the existing system to determine low pressure areas of the system. Pressures in the system should not be lower than 40 psi during normal operations. During a Fire Flow event, pressures in the system may not drop below 20 psi. The majority of the distribution system has sufficient pressure during normal operation, however the segment of pipe along E 9500 S has pressures less than 40 psi, which is unacceptable during normal operation. Alternatives to eliminate this concern are presented in Section Error! Reference source not found. of this report. A map showing pressure ranges t hroughout the system during PHD is provided in the map titled "Existing Peak Hour Demand – Minimum Pressures".

2.10.3.3. 20-Year Future (2045) Average Day Flow

2.10.3.4. 20-Year Future (2065) Peak Hour Flow

2.10.3.5. 40-Year Future (2065) Average Day Flow

2.10.3.6. 40-Year Future (2065) Peak Hour Flow

3. Future Conditions

3.1. Future Growth

Projecting Tetonia's future population is essential to the development of this Wastewater Facilities Planning Study. This projection of population growth allows for estimating future flow and the improvements that will be necessary to meet that demand. For the treatment system, this plan projects growth for 20 years into the future, to the year 2045, and the collection system projects the growth 40 years into the future. The population projections are based on historic US Census data that was provided in the Socioeconomic Profile in Section 2.2.16.

Over the past 50 years, the population has shown significant fluctuations with an overall positive growth trend. The average annual growth rate over the last 30 years was 2.9% and the population increased by 8.5% between 2020 and 2024 based on the number of new building permits as shown in Section 2.2.16.

A large development on the northwest corner of the Tetonia City Limits has been proposed and the 38 acre property is currently in the process of being re-zoned from TA (Transitional Agriculture) to R3 (High Density Residential). The project is proposing to add 90 single family residential units and 50 to 60 townhomes. It has been proposed to develop approximately 100 ERUs in phase 1 and 150 ERUs in phase 2 of this project. However, an exact timeline of full buildout is unknown. Due to this large number of anticipated units, a growth factor of 8.5% for the next 5 years, followed by an average annual growth rate of 3.0% was proposed. An 8.5% growth rate is very aggressive and would double the City's population within approximately 9 years. When looking at the growth rate over the last 50 years, it has never been this high. For this reason, a lower and more sustainable growth rate of 3.0% was proposed for the following 35 years (representative of the previous 30-year average annual % growth rate). With these growth rates, 100 ERUs would be added to the City within the next five years and the remaining 150 ERUs would be added over the next 20 years.

The information along with other potential growth rate options was presented to the City at the council meeting on 10/14/2025. The City of Tetonia decided to proceed with an average annual population growth rate of 8.5% for the first 5 years and 3.0% thereafter, as this rate is anticipated to best represent future growth.

Per the City's decision, the growth rates of 8.5% for 5 years and 3.0% for the years thereafter were utilized to project the current population and number of ERUs into the future. The Wastewater Facilities Planning Study is scoped to use a 20-year planning horizon to plan for the future of the treatment system and a 40-year planning horizon for the future of the collection system.

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Based on the Census Data from 2020, there were a total of 114 housing units, 106 of which were occupied. This equated to approximately 2.9 people per household with a 2020 population of 308 (United States Census Bureau, 2020). The current (2025) population was estimated by multiplying the number of new building permits by the average number of people per household, which results in a current population of 442 people. Then using the annual growth rates, the population is projected to double in 15 years and anticipating a population of 1,035 in 2045.

The population was projected using the Percent Growth Formula, which is as follows (NCEES, 2021).

$$P_t = P_0(1 + k)^n$$

Where,

P_t = Population at time t

P_0 = Population at time zero

k = growth rate (8.5% and 3.0%)

n = number of periods (total of 20 & 40 years)

Note that due to the flows in this report being viewed in terms of Equivalent Residential Units (ERUs), the same equation was used for projecting the number of ERUs, but replacing the Population value with the number of ERUs.

The anticipated population in 5-year increments is presented in Table 3-1 and shown graphically in Figure 3-1. Values have been rounded to the nearest whole number.

Table 3-1 Projected Population

Year	Population	Annual % Growth
2025	442	8.5%
2030	664	3.0%
2035	770	3.0%
2040	893	3.0%
2045	1,035	3.0%
2050	1,200	3.0%
2055	1,391	3.0%
2060	1,612	3.0%
2065	1,869	3.0%

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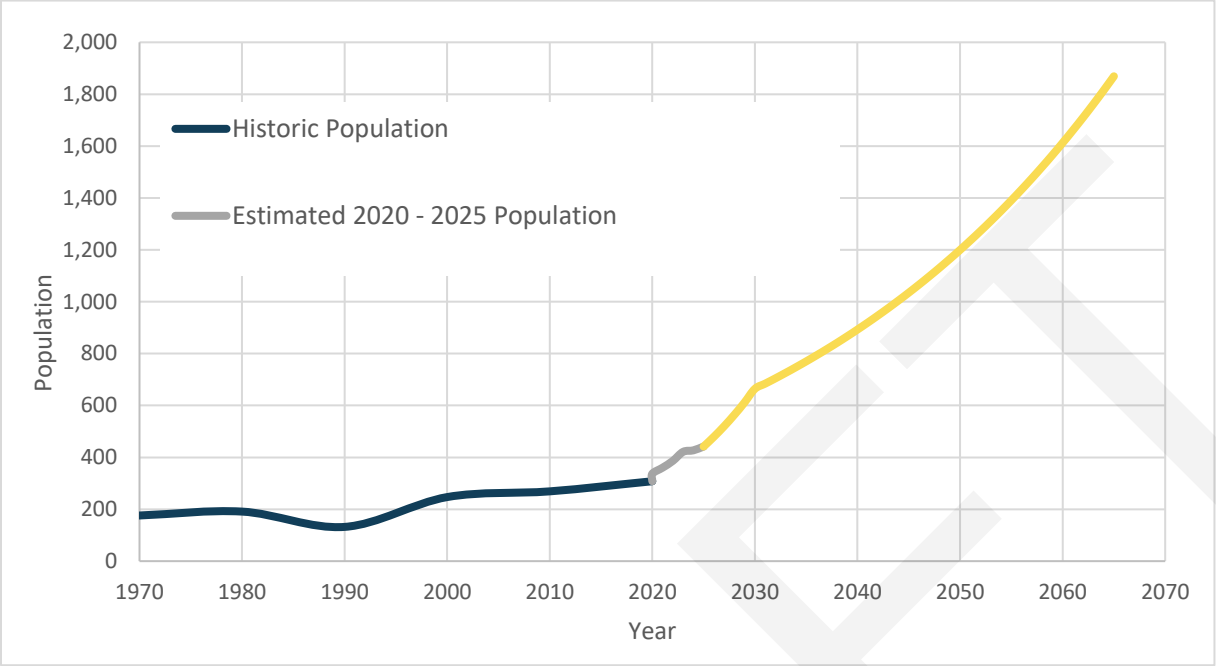

Figure 3-1 Historic and Projected Population

According to the data provided by the City of Tetonia, there are currently 140 residential EDUs and 59 Commercial EDUs in the system, as shown in detail in Section 2.3. An 8.5% and 3.5% growth rate were also used to project the number of EDUs into the future. Although residential and commercial connections may grow at different rates, it was assumed and agreed upon by the City at the Council meeting that applying the same growth rate to both was appropriate given that commercial connections are likely to increase alongside population growth. The results are presented in Table 3-2.

Table 3-2 ERU Projections with 8.5% Annual Growth until 2030 and 3.0% After

Year	Residential ERUs	Commercial ERUs	Total ERUs	New ERUs Since 2025
2025	140	59	199	-
2030	211	89	300	100
2035	244	104	348	148
2040	283	120	403	204
2045	328	139	467	268
2050	380	161	542	342
2055	441	187	628	428
2060	511	217	728	528
2065	592	251	844	644

3.2. Projected Flows

The projected annual average 2045 and 2065 flow rates were calculated using the established per ERU average day flow rates of 0.10 gpm/ERU (149 gpd/ERU) and the ERU projections provided in Table 3-2. The future maximum month average day (MMADF), maximum day (MDF), and peak hour flow (PHF) rates were calculated similarly, by using the design criteria established in Table 2-6 and the projected number of ERUs. Table 3-3 provides the anticipated future flows for 2045 and 2065. The 20-year projections are used for lift station and treatment facility sizing and the 40-year projections are used for collection system sizing. Note that the flow per ERUs did not change from the existing flows, as it is assumed that each ERU will consume the same amount of flow as the ERUs will in the future. The only change is in the system flows due to the increase in total ERUs.

Table 3-3 Future Wastewater Flow Rates

2045 System Flows							
Total Equivalent Residential Users (ERUs)					**467**		
Average Daily	48	gpm	2,873	gpd			
Max Month ADF	86	gpm	5,126	gpd	x	1.8	of Average
Max Daily	168	gpm	10,039	gpd	x	3.5	of Average
Peak Hour	193	gpm	11,565	gpd	x	4.0	of Average
2065 System Flows							
Total Equivalent Residential Users (ERUs)					**844**		
Average Daily	87	gpm	125,587	gpd			
Max Month ADF	155	gpm	223,215	gpd	x	1.8	of Average
Max Daily	303	gpm	436,191	gpd	x	3.5	of Average
Peak Hour	349	gpm	502,348	gpd	x	4.0	of Average

3.2.1. Seasonal and Day-Use Visitors

The City of Tetonia does not have a significant amount of commercial sites within this small communities and it is instead a town in which people live in. The large proposed development on he northwest corner of Tetonia, the goal is to provide more affordable housing for the Teton Valley area. This is intended to provide a place for people to live in the valley, as living in Victor and Driggs has become very expensive. Therefore, seasonal and day-use visitors will be very limited in Tetonia, due to the majority of people coming through town being residents and rather than visitors. The 2020 Census showed that 92% of people travel elsewhere for work, with an average travel time to

work of 32 minutes. Additionally, Tetonia only has 8 vacant homes, which shows that most people who come to Tetonia live there (United States Census Bureau, 2020). Therefore, seasonal and day-use visitors are not considered significant and are not included in this study.

3.2.2. Industrial Growth Impacts

There is currently only one industrial user in Tetonia, _____. The City does not currently anticipate any industrial growth in the future.

3.2.3. Flow Reduction Possibilities

Higher flows were observed in the winter months as shown in Section 2.2.4. This is most likely due to people leaving their faucets open all day to prevent pipes from freezing because many of the water lines are buried above the frost depth. In order to reduce this flow in the winter months, it is recommended to bury water lines deeper and establish a minimum depth in the Public Works Specifications Book.

While there was no significant Infiltration and Inflow (I&I) observed in the sewer collection system, there were a few segments of pipe that showed groundwater flowing in. Therefore, fixing these segments of pipe will reduce the amount of infiltration into the sewer system.

Additionally, installing new meters on individual culinary water connections and taking monthly readings may reduce consumption. As previously mentioned in Section 2.4.1, the water demands are significantly higher than sewer flows. This may indicate that a lot of users are utilizing the City's culinary water to irrigate their lawns. Understanding how much water individual users consume, the City could adjust their fees accordingly. This would reduce the amount of water consumed and in return result in less wastewater. Encouraging residents to install modern shower heads and low-flow toilets may also reduce the amount of wastewater generated.

3.3. Projected Collection System

A review of existing pipelines was performed to determine if the pipelines will have sufficient capacity to handle the projected sewer loadings. The estimated 2045 and 2065 peak hour wastewater flow for Tetonia are 193 gpm (0.43 cfs) and 349 gpm (0.78 cfs), respectively. As discussed in Section 2.5.1, an 8-in sewer pipe at the minimum recommended slope of 0.40% should be able to pass 0.64 cfs to maintain fair capacity (70% depth/diameter) and 0.38 cfs to maintain good capacity (50% depth/diameter). If the entire 2045 peak hour flow for the City of 0.43 cfs flowed through a single 8-in pipe laid at minimum slope, the pipe would be considered to be fair capacity. However, if the entire 2065 peak hour flow for the City of 0.78 cfs flowed through a single 8-inch pipe laid at minimum slope, the pipe would not have enough capacity. An 8-in pipe flowing full has a capacity of 0.77 cfs at minimum slopes. Therefore, the full pipe couldn't fully handle the 2065 flows.

In addition to pipe sizing and slope, pipe material can have a significant impact on the performance and life expectancy of a pipeline. A brief overview of each pipe material found in the Tetonia system is provided as follows:

- Concrete Pipe
    - Concrete pipe is susceptible to corrosion from hydrogen sulfide gas which is commonly generated in collection system pipes. Corrosion can be as high as one inch of thickness lost per year in highly corrosive applications.
    - Corrosion typically occurs in the top and sides of the pipe that are not submerged, leaving topless sections of pope. In these situations, cavities typically form in the surrounding soil, and the pipe is susceptible to collapse.
    - Depending on the corrosiveness of the system, the life expectancy of concrete pipe is often less than 50 years in sanitary sewer collection systems.
    - Based on the 2024 sewer videos, there are approximately 32 sections of pipe that have shown signs of corrosion. While most of these are considered minor or moderate corrosion, it is important to be aware of these pipes.
- PVC Pipe
    - PVC pipe is durable and effective when installed correctly. The most common PVC failure modes occur when the pipe is not bedded adequately and when the joints are not seated correctly.
    - The life expectancy of PVC pipe is over 100 years in sanitary sewer collection systems when installed correctly.
    - Based on the 2024 sewer videos, the majority of PVC pipes showed minimal signs of structural damages.

Nearly 80% of Tetonia's collection systems consists of concrete pipe. The remaining pipe sections are PVC or concrete pipe with small sections of PVC in between. The condition of all the pipes vary based on the most recent video inspections performed in 2024. The results of the video inspection was discussion in Section 2.5.1. Pipelines that are currently showing signs of structural damage will only get worse over time. Therefore, it will be important to repair critical pipes and continue to video inspect the system regularly to identify problems before major breaks or leaks occur.

The City's lift station has two pumps that are set to alternate within each pumping cycle. IDAPA requires pumps for lift stations to have at least two pumps in them with each pump being capable of handling peak hour flows on its own. Currently, each pump in the lift station pumps at 363 gpm. Both of these pumps are able to pump the 2025 peak hour flow of 83 gpm. Even in the future, each individual pump will be able to supply the peak hour flows of 193 gpm in 2045 and 349 gpm in 2065. One of the pumps was recently replaced in 2025. However, pumps wear out over time and should

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be replaced every ___ years. Therefore, it is recommended to replace the second pump in ___. As the flows increase closer to the 2065 anticipated flows, larger pumps may be considered.

3.3.1. Sewer Model – Future Flow Results

The Sewer Model setup was previously discussed in Section 2.10. The model showed that in the future, _____. A map of the proposed sewer system and critical pipe segments is shown in ____.

3.3.2. Lift Station Wet Well Sizing

As previously discussed in Section 2.5.3 of this report, a lift station wet well should provide storage of the influent ADF for 30 minutes. Based on an anticipated future influent flow of 48 gpm and 87 gpm in 2045 and 2065, respectively, the required volume was determined. In 2045, a minimum storage capacity of 1,449 gal will need to be provided in the wet well, which is less than the available storage calculated for the existing wet well of 1,817 gal. In 2065, the required storage volume of the wet well is anticipated to be 2,616 gal, which is significantly less than the available 1,817 gal currently provided. Therefore, by 2065, the lift station wet well will need to be upsized in order to meet future influent flow, assuming that all flow from the entire system will continue to enter into this lift station. Supporting calculations are included in Appendix ___ and a table summarizing this data is shown in Table 3-4 below.

Table 3-4 Lift Station Wet Well Sizing

Filling Time* =	30	min				
*Per 10-State Standards Section 42.62 on page 40-5.						
			Volume Required** (Gal)		Volume Provided*** (Gal)	
Current ADF =	21	gpm	618	<	1,817	(OK)
2045 ADF =	48	gpm	1,449	<	1,817	(OK)
2065 ADF =	87	gpm	2,616	>	1,817	(Not Good)
**Based on 30 min fill time of ADF						
***Based on Volume at which lead pump turns on.						

3.4. Projected Treatment System

The future capacity of the treatment system must only be calculated up to the 20-year growth projections, however due to the significant increase in development anticipated in Tetonia, the 40-

year growth was also evaluated. As stated previously, the following components were considered in the analysis of the treatment system:

1. Flow Capacity
2. Water Balance
3. BOD loading capacity of the treatment Cell (Cell 1)
4. Hydraulic Detention time of the system

These criteria was also evaluated for the future treatment system using the same equations, as previously shown in Sections 2.7.1 through 2.7.4.

3.4.1. Flow Capacity

As described in Section 2.7.1, IDAPA 58.01.16.493.08.a requires a minimum of three lagoon cells unless daily system flows are less than 50,000 gpd. Projected average daily flows are anticipated to reach 69,534 gpd by 2045 and 125,587 gpd by 2065. Therefore, a third lagoon cell will be required within the next 20-year planning period.

To estimate when the 50,000 gpd threshold will be reached, the corresponding ERU count was calculated using an average daily flow of 148 gpd/ERU. Based on this criterion, a third lagoon cell will be needed when the system reaches approximately 339 ERUs. A summary of this data is shown in Table 3-3 below and supporting calculations are provided in Appendix ___.

Table 3-5 Treatment System Flow Capacity

Current (2025) ADF =	*29,682*	*gpd*	<	50,000	*gpd*	*(OK)*	*3rd Cell Required when:*
Future (2045) ADF =	*69,534*	*gpd*	>	50,000	*gpd*	*(Not Good)*	
Future (2065) ADF =	*125,587*	*gpd*	>	50,000	*gpd*	*(Not Good)*	*# of ERUs = 339*

3.4.2. Water Balance

The Influent Volume is based on the new system flows of 2045, which is anticipated to be 48 gpm in 2045. Assuming that no improvements are made to the lagoons and land application site, the effluent volume will remain the same.

Influent Volume: 25.380 MG/year (48 gpm ADF from Section 3.2)

Effluent Volume: 31.599 MG/year (limits per Reuse Permit based on existing Pivot acreage)

System Capacity based on Water Balance:

$$Influent - Effluent = 25.380\frac{MG}{year} - 31.99\frac{MG}{Year} = -6.219\frac{MG}{Year} = -0.017\frac{MG}{day}$$
$$= 115\ Additional\ ERUs$$

In summary, the system on average has the capacity to handle an additional 0.017 MG per day. With an ERU being equivalent to 0.10 gpm (148 gpd), the system has the capacity for an additional 115 ERUs based on water balance. The system is capable of handling a total of 587 ERUs from a water balance analysis. Note that the system capacity could be increased to 840 ERUs if the land application site was expanded to the full 42 acres with a discharge limit of 45.208 MG/year per the Reuse Permit (this is equivalent to a System ADF = 86 gpm).

3.4.3. Oxygen Supply & Demand

BOD & NOD Loading

The future BOD and NOD loadings were calculated using the same equations as presented in Section 2.7.3. Based on the projected 2045 average daily flow of 0.070 MGD (48 gpm), the estimated loadings increase to 114 lb BOD/day and 114 lb TKN/day, respectively. By 2065, the BOD loading is estimated to be 203 lb/day, and the NOD loading is estimated to be 46 lb/day. (Calculations are shown in Appendix __.)

Oxygen Demand and Supply

The oxygen demand in the future was also estimated with the same equations presented in Section 2.7.3. Based on the calculated BOD and NOD loadings, the oxygen demand in 2045 is anticipated to be 352 lb O_2/day and 516 lb O_2/day in 2065.

If the existing aeration system remains unchanged (no additional aerators are installed), the lagoon will not be able to meet future oxygen demand while maintaining firm capacity. Therefore, the maximum number of ERUs that can be served with two installed aerators was evaluated. Under this condition, the treatment lagoon can accommodate up to 289 total ERUs, before an additional aerator is required. With a third aerator installed, the system can serve up to 579 ERUs. Once four total aerators are required, they will be able to provide capacity to approximately 1,135 ERUs. Table 3-6 below summarizes these findings and detailed calculations are included in Appendix ___.

Table 3-6 Oxygen Demand vs Supply

	O_2 Demand (lb O_2/day)		O_2 Supply* (lb O_2/day)			Total # of Aerators Required		# of Req. Aerators sufficient until # of ERUs reaches
Current (2025)	150	<	216	(OK)	->	2	->	289
Future (2045)	352	>	216	(Not Good)	->	3	->	579
Future (2065)	516	>	216	(Not Good)	->	4	->	1,135

**Only 1 Aerator is considered in this supply vs demand comparison because there must be 1 redundant aerator.*

3.4.4. Hydraulic Detention Time

The required hydraulic detention time of the system is 41 days, as previously described in Section 2.7.4. Based on an anticipated influent flow rate in 2045 of 48 gpm (69,534 gpd), the detention time in the future can be calculated as follows:

$$Future\ Detention\ Time = \frac{Lagoon\ Volume\ (gal)}{Future\ ADF\ \left(\frac{gal}{day}\right)} = \frac{5{,}135{,}000\ gal}{69{,}534\ gpd} = 74\ days > 41\ days\ (OK)$$

Since the future detention time is greater than 41 days, the size of the treatment lagoon will still be sufficient in 2045. The maximum capacity of the system was determined by finding the average flow rate at which the detention time equals 41 days. Therefore, the maximum treatment cell capacity based on hydraulic detention time is 87 gpm (125,244 gpd). In 2065, the ADF is anticipated to exceed this value. Note, that these calculations are based on a maximum capacity of the lagoon cell. It is not recommended to operate lagoons at their maximum capacity as it can reduce the life span of the lagoon and can result in a sludge buildup.

3.5. Winter Storage Capacity

The non-growing season during which the influent flow must be stored in the winter storage lagoon is 151 days, as previously described in Section 2.8. Based on the anticipated influent flow rate in 2045 of 48 gpm (69,534 gpd), the storage time in the future can be calculated as follows:

$$Storage\ Time = \frac{Lagoon\ Volume\ (gal)}{ADF\ \left(\frac{gal}{day}\right)} = \frac{9{,}656{,}000\ gal}{69{,}534\ gpd} = 139\ days < 151\ days\ (NOT\ GOOD)$$

Therefore, the storage time in the future will not be sufficient, as Cell 2 only has enough volume for 139 days. Based on the non-growing season lasting 151 days, the maximum daily inflow capacity of the storage lagoon is 63,947 gpd (44 gpm). Therefore, Tetonia must increase their storage volume before the average daily flows reach 44 gpm, which is anticipated to occur when the total number of ERUs reaches 433 (assuming one ERU is equivalent to 148 gpd).

3.6. User Charges and Operation and Maintenance Budget

The users of the Tetonia wastewater system are charged based on the number of ERUs, which is established by their user classification. The Table provided in the Sewer Fee Schedule of the Tetonia Resolution No. 2024-03 shows how each ERU is defined. The monthly sewer fee per ERU is $80.31

and any connections located outside of City limits, an ERU pays 1.5 times the amount ($120.47 per ERU). New connections are charged $2,000 and any new connections outside of City limits pay 1.5 times the In-City fee. Monthly charges are used for maintenance and general operation. Hookup fees are used to pay the impact that the connection will have on the system. As part of the wastewater project in 2009, the City issued two new bonds in the value of $750,000 a $300,000. These bonds have a 4.5% and 3.5% interest rate and they both mature in 2039. Table 3-7 shows the operations revenue and expenses for the previous three fiscal years that each ended in September.

Table 3-7 O&M Revenue and Costs

	2022	2023	2024
Total Operating Revenue			$169,448
(Operating Expenses)			($172,210)
			($2,762)
Nonoperating Revenues (Expenses)			($27,926)
Transfers in (out) of Reserve			

Sunrise Engineering is currently working on a Sewer Rate Analysis to determine if Tetonia is charging their users adequately. A copy of this study is provided in Appendix __. If improvements are made to the existing collection or treatment system, Tetonia will most likely need to increase their fees to pay off the loans for these improvements if they are not fully funded through grants or other funding sources. The required rate increase is discussed in Section ___ of this report.

3.7. Land Use Plans

The City's zoning map was reviewed to determine land use of open areas within the City. A large open area is located on the east bench, which is not anticipated to be developed at this time. Another open area is located on the northwest corner of the City. Development plans for a large subdivision at this site have already been provided to the City and the property is currently being re-zoned from agricultural to residential.

The Teton County zoning map indicates the areas surrounding the City as Impact Area. The expectation of the Impact Area zone is the area would eventually be annexed into the City and adopt zoning per the City's standards. As most of the area surrounding the City is adjacent to residential uses, the expectation for the land use would be residential with commercial or industrial in areas located near those types of zones. It is anticipated that the surrounding properties on the west side of the City would like to annex sometime in the future.

Most areas could connect to the City's wastewater system. Lift stations may be required for areas on the south side of the City, depending on the proposed elevations compared to the existing system. For treatment expansion, the City would need to look at either adding another lagoon cell or potentially changing treatment options if more properties outside of the City limits were connected

to the City system. According to DEQ guidelines, any structure located within 1,000 ft of City limits should connect to the City sewer system. Since most of these structures outside of City limits are low-density, it may not be worth expanding the system until more development comes in those directions.

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4. Development and Initial Screening of Alternatives

4.1. Existing System Deficiencies

Based on analysis in the prior sections, and discussions with City personnel and operators, the following system deficiencies were identified:

SCADA

- System cannot be used to turn any pumps on or off.
- It is not recording and keeping accurate/useful records.
- It does not track flow that comes into the Lift Station.
- It does not track what goes into the Land Application Site.
- The Land Application site does not have any SCADA hooked up at all.
- It can only be used for tracking, not recording or operating remotely. The City has installed fiber at all sites to allow for SCADA system to be connected in the future. A lot of the hardware is installed but it is not connected but not operated or utilized.
- The flowmeter downstream of the lift station is reading nearly 100 gpm higher than the measured flow. Re-calibration of this flow meter is needed in order for the SCADA system to record accurate data.

Sampling and Recording

- Annual reports for DEQ are not being filled out accurately due to shortage of operators and poor flow tracking.
- Very limited sample tests were available for this report. Sampling frequently is important to ensure the system is working properly.
- The City is unsure whether or not the system is being operated at optimum, due to a lack of operator staffing. However, the City has recently hired a new operator.

Septic System

- There is one septic system located within City limits (at 2501 W Hwy 33). The new DEQ rule requires single residence located within 1,000 ft and subdivisions within 2,000 ft from a sewer collecting line to connect to the City system (Idaho DEQ, 2024). Tetonia should update their ordinance to reflect this new regulation.

Collection System

- A house located on W 600 N was flooded twice within the last two years. This may have been caused by roots penetrating the pipeline and causing leaks and sewage to backup and

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overflow. This house is also located near the RV Dump, which may have contributed to the backing up of sewage if the pipe diameter was restricted.

- Not a lot of information is available on the RV Dump station. Adding pre-treatment requirements, sand & grease trap and other requirements to the ordinance may be beneficial to prevent buildup.
- Based on the video inspections, there are approximately 14 segments of pipe (total ~3,000 ft of pipe) that needs structural repairs due to either cracking, deformation, sagging, joint defects, corrosion, infiltration & inflow, invasion of roots, or the condition of the service.
- Due to the shallow slopes of many pipes, a lot of debris, FOG, and sewage builds up in the pipelines and in manholes. Approximately 10 segments of pipe (~1,600 ft of pipe) were identified via the sewer videos of having either debris & sediment, grease or FOG, or other obstructions in the pipeline. Flushing the pipelines more frequently would reduce the amount of buildup.
- The City does not have an inventory of the grease interceptors installed within their system.
- The City does not have a good inventory of their Manholes.
    - The inverts and depths to most manholes are unknown.
    - A lot of the manhole lids are buried. This is causing rocks to get into the manholes and blocking the pipelines.
    - Since most of the roads within Tetonia are gravel roads, this most likely contributes to the amount of rocks getting into the manholes and pipelines.
    - The City reported that at least two of the manhole lids within the system are broken.
    - The City reported that some of the manhole covers are not traffic rated.
    - The City reported that some of the manholes do not have a concrete collar around it.
    - The depth of the manholes is an issue, as some are buried too high and others too low.
- Due to water pipes being buried very shallow, residents leave their water running during the winter months when temperatures stay below freezing. This results in higher flows during the winter.

<u>Lift Station</u>

- The wet well currently has sufficient capacity, however when the number of ERUs reaches 591 it will need to be upsized.
- Operators have reported seeing a lot of fresh/clean water flowing into the lift station. Groundwater is not observed to be very shallow and infiltration and inflow was minimal.
    - are manholes not watertight?
    - Inflow caused by lids being buried?

- The safety of a lift station is a concern in regard to pulling the pumps out for maintenance. The City ordered a crane to be placed on the back of the pickup to safely lift pumps out.
- The Lift Station runs based on transducer floats, however the City is uncertain what the on and off settings are and whether or not these are the most optimal settings.
- The pumps do not have a 'non-clog' function, and the alarm goes off often due to debris getting stuck. When this occurs, the pumps are run in reverse to unplug them. However, running pumps in reverse can be harmful to the pump and is therefore not a good long-term solution. Non-clog pumps should be considered for replacement pumps in the future.
- The sewer model showed that the pumps were operating outside their optimum operating range. This is most likely due to the pump being inadequately sized for the head.
- The Annual Lift Station report listed some deficiencies including some general maintenance items of the lift station, as well as pump repairs, the lack of a redundant emergency float system, calibration of the flow meter, the lack of reversing switch gear for the pump etc.
- Pipe velocities in a force main should stay between 2 ft/s and 8 ft/s to maintain self-cleansing flow and limit headloss. When the pump starts up, reaching at least 2.5 ft/s helps flush debris. Once running, staying at or above 2 ft/s prevents solids from settling. Velocities above 8 ft/s create higher headlosses, meaning the pump has to work harder. At 363 gpm through a 4-in pipe, the velocity is approximately 9.3 ft/s, which is higher than the recommended velocity. Increasing the force main piping to a 6-in pipe would drop the velocity to 4.1 ft/s. It is possible that the existing pumps are operating less efficiently due to the high velocity and the resulting headloss.

Treatment System

- Screening at the lagoons is an issue.
- The City has reported that the water in the lagoons does not appear to rise in the winter. It is uncertain where the water is going, especially considering that the winter months are the high-season flows for the City of Tetonia.
- The power cables to the aerators in the lagoons are too short.
- The Oxygen demand will exceed the oxygen supply provided by the aerators in the treatment lagoon when the system reaches 289 ERUs. At this time, a third aerator will need to be installed.
- When the average daily flow exceeds 50,000 gpd, a third lagoon cell will be required which is anticipated to occur when the number of ERUs is 339.
- The lagoon system will also run out of hydraulic capacity when the system has 849 ERUs.
- The Winter storage capacity is anticipated to be insufficient for the nongrowing season in the near future. The storage capacity is currently sufficient, however when the total number of ERUs in the system reaches 433, additional winter storage will need to be provided.

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- The influent and effluent BOD samples taken from the Lift Station and the transfer structure between the treatment lagoon and the storage lagoon only revealed a 40% BOD removal. Aerated lagoons are typically designed to remove 85% of the BOD, which indicates that treatment may not be working properly. This is likely due to the aerators which needed maintenance as recorded by the operators.

Land Application Site

- Low chlorine levels were observed at the land application site in the Summer of 2024 which were caused by malfunctioning of the chlorine injection pump. The VFD (Variable Frequency Drive) valve settings had to be adjusted to make up for the chlorine deficiency. The VFD broke, which may have been caused by sediment. This valve was replaced and it started working again, however Chlorine levels were barely within the allowable limits. The City may need a bigger chlorine pump for the treated water, as the current one is not dosing enough.
- The pivot does not have a space motor. It takes approximately 6 weeks to order a new one, which can impact the storage volume.
- Daily readings for the supplemental well are not available. This pump is not metered and the land application report required daily readings to ensure compliance.
- The secondary filter at the pivot is in poor condition.
- The piping to the pivot is not ideal.
- DEQ requested the City raise the Nitrogen levels in soil (at pivot).
- The land application site will need to be expanded when the number of ERUs reaches 587.

Future Development

- As large-scale subdivisions are proposed to be connected to the City system, the cost of improvements becomes problematic, as these developments would more than double the size of Tetonia over the next 20 years. Adequate connection fees will be essential to ensure the system can continue to operate with new additions.

Capacity

Criteria	Current (2025)	Future (2045)	Future (2045)
Collection System			
Gravity Pipe d/D < 70%	✓	✓	✗[7]
Gravity Pipe q/Q < 70%	✓	✓	✗[7]
Gravity Pipe Velocity > 2 ft/s and < 8 ft/s	✗[8]	✗[8]	✗[8]

[7] Maximum capacity of sewer main that collects the entire system is 707 ERUs.
[8] All/most gravity pipes have velocities less than 2 ft/s during average day flows.

Criteria	Current (2025)	Future (2045)	Future (2045)
Force Main Pipe Velocity > 2 and < 8 ft/s	✗[9]	✗[9]	✗[9]
Lift Station			
Has at least 2 pumps	✓	✓	✓
Each pump can pump PHF	✓	✓	✓
Wet Well Capacity	✓	✓	✗[10]
Treatment System			
Flow Capacity (Min. # of Cell Requirement)	✓	✗[11]	✗[11]
Water Balance (Land Application Site)	✓	✓	✗[12]
Oxygen Supply & Demand	✓	✗[13]	✗[13]
Hydraulic Detention Time (Treatment Cell)	✓	✓	✗[14]
Storage Capacity of Winter Storage Cell	✓	✗[15]	✗[15]

4.2. Development of Alternatives

This section discusses different projects that could be implemented to address existing system deficiencies. These projects could be constructed all at once as part of a single larger project or broken up into phases to be constructed overt time. The timing on implementing these projects may be influenced by the rate of growth in the system including from the proposed subdivision development project on the northwest corner of Tetonia.

4.2.1. Collection System Improvements

4.2.1.1. Alternative 1 - Cleaning and Video Inspection

In 2024, the City's sewer system was videoed to identify locations where pipelines needed replaced, repaired, or maintained. The videos showed that a lot of debris, including rocks block the pipeline before flushing. Rocks were mostly observed in the manholes and in the sections of pipe near manholes. Due to the shallow slopes of many of the pipelines, a lot of sewage and debris moves very slowly and often gets filled up in parts of the pipe. Therefore,

[9] The pipe velocity through the 4" section of pressure pipe exceeds 8 ft/s.
[10] The wet well capacity will be exceeded when the number of ERUs reaches 591.
[11] Maximum capacity before a third lagoon cell is required is 339 ERUs.
[12] Maximum capacity before additional land application site is required is 587 total system ERUs.
[13] Maximum capacity with the current system (2 aerators) is 289 ERUs. With 3 aerators, the maximum capacity is 579 ERUs and with a 4th aerator, the capacity is 1,135 ERUs.
[14] Maximum capacity of the treatment cell based on HDT is 849 ERUs.
[15] Maximum capacity of winter storage cell is 433 ERUs.

this alternative recommends implementing a cleaning/flushing schedule. Pipes should be flushed at least annually, to ensure everything moves down the system and prevent buildup. If video inspections show significant build up, then more frequent flushing may need to be implemented. It is important to continue to keep good records of pipelines and monitor its condition over time, especially as new development is proposed. Therefore, this alternative also proposes to video inspect the whole system annually (or bi-annually if budget/funding does not allow for more frequent videos) and identify pipe deficiencies such as sags, breaks, root intrusions, or deteriorating pipe.

4.2.1.2. Alternative 2 - Monitoring Improvements

Alternative 2A - Sample Testing

The City has very limited flow data as well as lab work data for the quality of the influent available. Therefore, this alternative suggests taking more frequent monitoring samples of the influent as well as samples from the Lagoon. It is suggested that the City take samples as follows:

- Influent BOD[16]: monthly
- Effluent BOD[17]: monthly

Alternative 2B - Improving SCADA

This alternative suggests improving the SCADA system to monitor flows more effectively and accurately. It is proposed to utilize the existing SCADA system and connect it to the hardware that has been installed but not connected yet. The SCADA system should also be re-configured to allow operators to access the information from their phone and turn pumps on or off directly from their device, in case of an emergency. The system should provide information regarding the water level in the Lift Station and it should record the influent flows and store the information. Additionally, the SCADA system should be connected to the flow meter inside the Chlorination building to track flows to the Land Application Site.

[16] Sample taken at the Lift Station.
[17] Sample taken at the transfer structure located between Lagoon Cell 1 and Cell 2.

4.2.1.3. Alternative 3 - Lift Station Improvements

Alternative 3A – Recommended LS Improvements from Annual LS Report

This alternative recommends implementing all recommendations listed in the Annual Lift Station Report, which include:

1. Tightening the rubber grommets in the rail system.
2. Installing lifting bales on the pumps.
3. Cleaning out the lift station from debris and steam cleaning the grease ring and the sides of the walls.
4. Installing a redundance emergency level control system.
5. Installing a 3-postion switch for the reversing pump and safety gear to keep the pumps safe.
6. Repairing the bearings on Pump #2.
7. Calibrating the existing flow meter (located inside the dry well).
8. Constructing a permanent stand for the wastewater debris collection, to replace the bucket that currently hangs below the inlet pipe.
9. Removing the submersible transducer from the conduit and placing it on a weight and chain kit instead.
10. Changing the pump overloads from 8 amps to 15 amps.

Alternative 3B - Non-Clog Pump

The City has expressed their desire for a non-clog pump. Therefore, this alternative suggests replacing the existing pumps with a non-clog sewage pump, when their life span is reached. A cutsheet of a suitable[18] pump is included in Appendix __. Since Pump #1 was recently replaced in 2025, this pump should last between 10 to 15 years, if maintained well and running at optimal efficiency. At this time, it is recommended to re-evaluate the influent flows and determine the most suitable option. If pumps are replaced sooner, it is recommended to install a pump that can handle the current and future peak hour flow of the system, which is anticipated to be 193 gpm in 2045 and 349 gpm in 2065. Since the pumps are operating outside of their optimum operating range, it is recommended to re-evaluate the pressure head and select a more suitable pump for this lift station.

[18] This pump was selected preliminarily. When/if the City chooses to install a new pump in the lift station, it is recommended to re-evaluate the flows, head, and friction losses at that time to find a suitable pump.

Alternative 3C – Upsizing Wet Well for Future Flows

As discussed in Section 3.3.2, the wet well is sized to handle up to 591 ERUs. If the entire system flow continues to enter into this lift station in the future, the wet well must be upsized to accommodate the extra flow. The wet well must be able to store 30 minutes of the average daily influent. The wet well should be sized to handle future flows, however over-sizing it can cause odor control issues. Therefore, this alternative recommends upsizing the wet well to a 10-ft diameter wet well. However, it is recommended to re-evaluate the flows at the time to determine an adequate size.

4.2.1.4. Alternative 4 - Pipe Improvements

As discussed in Section 2.5.1, Sunrise Engineering reviewed the videos of the collection system. Based on these videos, a number of pipelines were identified as needing maintained or repaired. This alternative proposes to work on these segments of pipe to ensure proper function in the future. These are separated into pipelines that need operational improvements or maintenance and pipelines that need repaired based on structural deficiencies.

Additionally, Section 3.3 discussed that the 8" transmission line from the City to the Lift Station will run out of capacity by 2065 or sooner. Therefore, this alterative also proposes to replace this pipeline with a larger pipe when the peak hour flow reaches approximately 290 gpm or 707 total ERUs.

Alternative 4A – Pipeline Maintenance

Table 4-1 below shows the proposed pipeline segments that need maintenance improvements. This list is based on segments that were identified as ratings greater than 3. Pipes with a rating of 3 are considered "moderate" which are pipelines that need future maintenance; rating 4 was considered "severe" it needs repair; and rating 5 being "most severe" which are pipes that need immediate repair. The pipe improvements are ordered from highest to least priority. It is recommended to start with most severe and severe segments. As budget and time allows, the moderate pipe segments should be flushed.

Table 4-1 Alternative 5A Pipeline Segments that need Maintenance

Alternative	Upstream MH	Downstream MH	Material	Length	Reason for Maintenance
Most Severe Pipe Segments (Rating 5)					
4A.1	MH-4	MH-3	PVC		Obstruction - couldn't finish camera

Alternative	Upstream MH	Downstream MH	Material	Length	Reason for Maintenance
Severe Pipe Segments (Rating 4)					
4A.2	MH-71	MH-70	CONCRETE	184	Lots built up near MH-70
4A.3	MH-66	MH-55	CONCRETE	194	
4A.4	MH-46	MH-45	CONCRETE	242	Sealing Ring crosses at joint
4A.5	MH-3	MH-2	PVC	76	
Moderate Pipe Segments (Rating 3)					
4A.6	MH-30	MH-15	Concrete	167	Sediment or grease built up near mh-30
4A.7	MH-15	MH-64	Concrete	341	A lot of sediment or grease built up near mh-15; roots in joints
4A.8	MH-75	MH-70	Concrete	153	Lots built up near mh-75
4A.9	MH-67	MH-55	Concrete	395	Some corrosion at joint
4A.10	MH-62	MH-11	Concrete	197	
4A.11	MH-61	MH-60	Concrete	218	Lots of debris built up at mh-61
4A.12	MH-73	MH-72	Concrete	137	
4A.13	MH-52	MH-51	Concrete	186	
4A.14	MH-49	MH-48	Concrete	365	Some corrosion in joint
4A.15	MH-53	MH-56	PVC	332	Rocks near in pipe at mh-53, roots in tap (before pre-cleaning)
4A.16	MH-43	MH-42	Concrete	364	A lot of sanitary products built up causing backup; sealing grout in joint
4A.17	MH-36	MH-34	Concrete	354	A lot of debris in joints
4A.18	MH-41	MH-40	Concrete	205	
4A.19	MH-28	MH-27	PVC	357	Appears to have rocks in bottom of pipe
4A.20	MH-27	MH-26	PVC	371	
4A.21	MH-9	MH-8	Concrete	448	Pipe longer than 400'
4A.22	MH-8	MH-7	Concrete	330	
4A.23	MH-10	MH-29	Concrete	365	

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Alternative 4B – Pipeline Repair

Table 4-2 below shows the proposed pipeline segments that need repaired or replaced. This list is based on segments that were identified having a rating 3 or greater. Pipes with a rating of 3 are considered "moderate to severe" which are pipelines that need repair in the near future; rating 4 was considered "severe" which are pipes needing repair; and rating 5 being "most severe" which are pipes that need immediate repair. The pipe improvements are ordered from highest to least priority. It is recommended to repair these segments of pipe as soon as possible. Table ___ in Appendix ___ shows a continuation of this list for category 3 ranking pipes. As budget allows, these segments should be repaired in the future.

Table 4-2 Alternative 5B Pipeline Segments that need Repair/Replacement

Alternative	Upstream MH	Downstream MH	Material	Length	Reason for Maintenance
Most Severe Pipe Segments (Rating 5)					
4B.1	MH-22	MH-21	Concrete/PVC	192	Infiltration at joint; bad roots -> couldn't complete camera
4B.2	MH-65	MH-71	Concrete	294	Large hole (but it looks like there might be white PVC pipe behind it); lots of grease and rocks built up near MH-65
4B.3	MH-34	MH-41	Concrete	161	Large obstruction - roots in joint
Severe Pipe Segments (Rating 4)					
4B.4	MH-76	MH-21	Concrete	246	Lots of infiltration in joint closest to MH-21; beaver slide at MH-21
4B.5	MH-18	MH-17	Concrete	387	Roots in joints
4B.6	MH-12	MH-11	Concrete	218	Corrosion at joint
4B.7	MH-13	MH-12	Concrete	114	Sagging Pipe
4B.8	MH-44	MH-37	Concrete	240	Some joint separation, not much flow

Alternative	Upstream MH	Downstream MH	Material	Length	Reason for Maintenance
					(standing water/debris)
4B.9	MH-58	MH-10	Concrete	229	Large root growing out of rim of service; Sagging Pipe; Debris built up near MH-10
4B.10	MH-53	MH-47	PVC	78	Abandoned due to debris in pipe, Sagging Pipe (15% of vertical dimension)
4B.11	MH-63	MH-35	Concrete/PVC	256	Roots near MH-35; roots in several joints (5% pipe lost)
4B.12	MH-38	MH-29	Concrete	23	Camera couldn't get through; Sagging Pipe

Alternative 4C – Pipeline Replacement

An analysis of the pipe capacity through the 8" gravity pipe that flows directly into the Lift Station from the collection system, will run out of capacity in the future. In 2045, with an anticipated peak hour flow of 193 gpm (0.43 cfs), the pipe will be approximately 56% full. Therefore, the pipe will be considered having 'fair capacity' in 2045. As the population continues to grow, the pipe will be approximately 81% full in 2065, when the peak hour flow is anticipated to reach 349 gpm (0.78 cfs). In 2065, the 8" gravity pipe will be out of capacity and therefore need upsizing.

This alternative proposed to replace the gravity trunkline with a 12" diameter pipe. With a slope of 0.55% (current slope), this would yield in a 42% full pipe. This would ensure the pipe will have good capacity in the future. However, as flows change over time and projections are an estimate, calculations with the new flows should be run at the time this pipeline is replaced and the size must be verified then. See Appendix ___ for the calculations. (Note that the calculations are slightly more conservative than the computer model.) The new pipe should be PVC laid at a minimum slope of 0.40%.

4.2.1.5. Alternative 5 - Manhole Improvements

Alternative 5A - Manhole Inventory

Due to the lack of inventory of the Manhole inverts, the slopes of most pipelines within the existing collection system are unknown. Based on minimum slope requirements, the model showed that most pipelines within the system have velocities less than 2 ft/s. Slow velocities can cause debris and other waste to buildup. An inventory of the manholes may reveal that slopes and velocities are adequate. An inventory would also help identify the location of buried manholes and the condition of these manholes. Therefore, this alternative proposed the City take inventory of each manhole and survey their locations, so that more accurate models can be built in the future. This will also aid the City as future development is proposed to connect to the system. The inventory should include the location and invert depths of the manhole. It should clearly show which directions the pipes are coming from and their sizes. The inventory should also include data on their current condition and whether they are located in an asphalted or gravel road. The inventory should state whether then Rim is flush with the pavement and whether or not it is constructed to current standards.

Alternative 5B - Manhole Repairs

Another critical part of this alternative is to repair the damaged manholes. It was noted that there may be some lids that are broken or not traffic rated. These should be repaired immediately to prevent injuries. This alternative also suggests that the manholes that are lacking a concrete collar be repaired and repaired to meet current standards. It is also proposed to raise or lower the lids to match finished grade elevations.

4.2.1.6. Alternative 6 - No-Action to Collection System Alternative

The No-Action alternative would leave the system as it is. Taking no action will likely results in:

1. Incomplete data on usage and other criteria.
2. Lift Station Failure.
3. Failing segments of gravity pipeline.
4. Exceeding capacity of gravity trunkline.

Incomplete flow data would mean that the city would be unable to identify trends that could indicate leaks or changes in use patterns that indicate a faster or slower rate of growth than what is projected in this report. If the lift station deficiencies are not addressed, it can result in clogging and the lift station backing up. As this takes in the flow from the entire system, having the pumps go out due to clogging, can cause a lot of issues throughout the pipe

network. Failing pipelines could result in pipelines backing up and overflowing and potentially causing basements to flood or discharging raw sewage into the environment.

The no-action alternative has no capital expenses incurred initially. However, no-action now may result in a system failure that would be much more expensive to address later on. Because the recommended improvements have an outsized benefit relative to their low cost, the no-action alternative is not advised.

4.2.2. Treatment System Improvements

In the future, it is anticipated that the treatment lagoon as well as the winter storage cell will run out of capacity. Based on BOD loading, the treatment lagoon can handle up to 257 ERUs and the winter storage lagoon can handle up to 433 ERUs. Therefore, both cells will exceed their capacity in the next 20 years. Typically, treatment system planning is required to address only a 20-year planning period. However, due to anticipated growth and potential future annexations, a 40-year horizon will also be evaluated.

Therefore, the existing treatment system must either be expanded or abandoned and a new system be constructed. Conventional wastewater treatment methods include biological, physical, and chemical treatment of sewage. Once water has been treated, it can be discharged to surface water and sludge is disposed of. Effluent water has to meet stringent quality standards before it can be discharged. Permits must be acquired before any water is discharged from the treatment facility.

Wastewater could also be treated to a quality that allows for the reuse of wastewater. Treatment and disposal of reuse involves treatment strategic techniques. These include having water discharged such that nothing returns to a surface water body. The EPA has designed reuse as an alternative treatment option. This treatment option does not require a discharge permit for operation, but instead requires an operating permit to be issued before operation. The operating permit is often acquired in conjunction with the construction permit.

This section of the report discusses the proposed improvements that need to be made to the treatment system in order to have sufficient treatment, storage, and discharge capacity in the future.

This section is broken up into three sections, including alternatives that provide additional treatment capacity, storage capacity, and discharge capacity.

The following alternatives would either provide *additional treatment capacity or ensure the existing system is improved:*

- Alternative 7 – Additional Aerator (Conventional)
- Alternative 8 - Additional Aerated Treatment Lagoon (Conventional)
- Alternative 9 - Mechanical Treatment Plant (Conventional)

  - Alternative 9A – Conventional Mechanical Treatment Plan (Conventional)
  - Alternative 9B – STM Rotor Treatment Plant (Unconventional)
- Alternative 10 - Sludge Handling and Disposal (Conventional)

The following alternative would provide additional storage of the treated water before it is discharged.

- Alternative 11 - Additional Winter Storage Lagoon

The following alternatives are ways the treated water can be discharged, either through re-use, infiltration, or surface discharge.

- Alternative 12 – Expansion of Land Application Site (Conventional)
  - Alterative 12A – Slow Rate Application by Sprinkler Irrigation (Conventional)
  - Alternative 12B – Soil Aquifer Treatment by Rapid Infiltration Basins (Conventional)
- Alternative 13 – Intermittent Sand Filtration (Conventional)
- Alternative 14 - Construction of Wetlands (Unconventional)
- Alternative 15 - Discharge Treated Water to Surface Water (Conventional)

Treatment Alternatives

4.2.2.1. Alternative 7 – Additional Aerator

As discussed in Section 3.4.3, the oxygen demand will exceed the oxygen supply when the number of ERU reaches 289. Therefore, this alternative proposes installing a new aerator in the existing treatment lagoon. This will allow the water to be treated sufficiently until the number of ERUs reaches 579, at which time a third lagoon cell should already have been constructed due to the daily system flow exceeding 50,000 gpd. It is recommended to obtain the same or a similar aerator as what is currently provided with the following criteria:

Electric Motor:	5 hp
Oxygen Transfer:	1.8 lbs of O_2 / hp * hr
Oxygen Transfer per Aerator:	9.0 lbs of O_2 / hr

If the new aerator is unable to provide at least 9.0 lbs of O_2 per hour, then multiple aerators will need to be installed to provide adequate oxygen supply.

4.2.2.2. Alternative 8 - Additional Aerated Treatment Lagoon

Aerated lagoons are stabilization ponds with a mechanical aerator, which are typically designed deeper than non-aerated lagoons, between 10 and 15 ft (Lindeburg, 2018). Aerated lagoons typically require a shorter detention time, but this is dependent on the climate conditions. Aerated lagoons mostly rely on the air and bacteria to clean the water. This process is dependent on dissolved oxygen. Oxygen is supplied to the pond by aerators and the aerobic bacteria that live in the pond use the available oxygen to decompose organic solids.

The current system utilizes only a single aerated lagoon to treat wastewater. With the population increases likely to occur in coming years, particularly from the new development on the northwest corner of Tetonia, a community planned to have 250 additional connections, additional treatment capacity will be needed. Adding an additional aerated lagoon would allow for more treatment and maintain proper detention time for adequate treatment. Since it is required by the state that a minimum of three cells are provided if daily flows exceed 50,000 gpd. A second treatment cell will be required when the number of ERU reaches 339.

Constructing an additional cell would enable a larger volume of wastewater to be treated. It would also provide more surface area for evaporation of any excess wastewater. In order to construct another cell, additional land would be required. The City of Tetonia owns the property to the north of the existing treatment lagoons, which is approximately 10 acres in size and may be a suitable site for a new treatment lagoon. The construction of a new lagoon is not anticipated to impact any nearby wetlands. If wetlands were nearby, proper permitting through the Army Corps of Engineers and Idaho DEQ would be required. To meet 2045 demands, an additional 1.5 acres of treatment cell will be needed and an additional 4.1 acres by 2065.

4.2.2.3. Alternative 9 - Mechanical Treatment Plant

When the total number of ERUs reaches 339, an additional treatment cell will be required. A second winter storage lagoon will be needed when the total reaches 433 ERUs. Therefore, two additional lagoon cells will be required to provide adequate treatment and winter storage within the 20-year planning period.

In addition, the existing land application site is projected to reach its capacity at approximately 587 ERUs, which is anticipated to occur between 2050 and 2055 (within the 25- to 30-year planning period). Because constructing two additional lagoon cells and expanding the land application area would require a substantial amount of land—likely to

be acquired by the City—it may be beneficial for the City to evaluate a mechanical treatment plant as an alternative.

This alternative includes two mechanical treatment options: Alternative 9A, which would treat effluent to a level suitable for surface discharge, and Alternative 9B, which would incorporate the existing lagoons and land application site as part of the storage and disposal process.

Alternative 9A – Conventional Mechanical Treatment Plant

There are multiple methods of mechanical treatments. One type is an activated sludge process, which may exist in one of several variations including oxidation ditches. A typical activated sludge plan would include an aeration basin where environmental conditions are controlled to produce an active population of bacteria. The bacteria feed upon the pollutants in the wastewater. Oftentimes, oxygen needs to be supplied trough injection by compressed air during mechanical mixing to maintain healthy levels of dissolved oxygen (DO). The activated sludge process could also utilize nitrifying organism to obtain the desired degree of treatment.

Also included in mechanical treatment methods are pretreatment processes where macro solids such as plastics, grit, and other organic solids are settled and screened out of the water. Mechanical treatment will reduce BOD and TSS to the specific treatment standards.

Mechanical treatment is usually accomplished in an centralized plant that discharges to a local stream, river, or lake. Mechanical treatment processes have been used for decades with positive and reliable results. Analyzing the feasibility of mechanical treatment for Tetonia requires evaluating local conditions, costs, environmental impacts, and results in comparable areas. The most significant by-product in wastewater treatment is sludge. There are uses available for sludge, such as fertilizer and soil stabilization. Based on the location of the current wastewater facility, sludge as a fertilizer could be considered. The other option for disposing of sludge is to dewater then bury it at the local landfill.

Construction of a mechanical treatment plant would require abandoning the existing system. Initial and annual operating costs would be expensive for Tetonia.

Alternative 9B – STM Rotor Treatment Plant

The STM Rotor treatment process is similar to a conventional treatment plant but does not treat the wastewater to the degree required to discharge to surface water. The treated water would have to evaporate in evaporation ponds or be land applied. This plant provides pretreatment in the form of screening and conditioning. Wastewater is treated by aeration to produce an active population of bacteria. The bacteria feed upon the pollutants in the

wastewater, and oxygen is provided through mechanical mixing. The treated water then flows to the lagoons, and the sludge is pressed, dried, and baked to be taken to the local landfill.

Since Tetonia already has an existing lagoon system and land application site, this alternative may be a viable option. For the purposes of this WWFPS, however, only the conventional treatment plant alternative is evaluated further. If the City elects to pursue a mechanical treatment plant in the future, the STM treatment process could be evaluated in greater detail at that time.

4.2.2.4. Alternative 10 - Sludge Handling and Disposal

In the current state, the lagoon system is handling sludge disposal. The options of slow-rate land application or rapid infiltration basins, which is discussed in Alternative 12, continue to use the existing lagoon system. Neither of those options is expected to require any changes for handling sludge disposal. However, as the influent flow reaches near the maximum capacity of the lagoon, the need for dredging and cleaning of the lagoon will be necessary when it gets full. Lagoons can typically last up to 40 years before dredging is needed, if it is not operating close to capacity. As the loading gets higher, it needs to be surveyed and dredged more often. To determine whether or not sludge is becoming a problem, a 'sludge survey' can be performed in which a boat is utilized to go out into the pond and test the sludge depth. Depending on the depth, there are a few different options on how it can be removed.

In the event that sludge removal and disposal need to occur, the City must have a sludge management plan in place. The plan should include how the lagoons will be dredged. There are several options including:

1. *Chemicals* can be added to help consume sludge.
2. *Sludge Aerating*, in which chains are dragged across the lagoon to increase aeration. Only approximately 10% of the lagoon would be sludge aerated at a time.
3. *Sludge Dredging*, which is the manual removal of the sludge through dredging. This must be done by a third-party contractor and can get expensive, depending on the size of the lagoon. A portable belt filter press is recommended to be brought to the site to dewater the sludge. Following dewatering, the sludge will need to be disposed of at an appropriate landfill.

The sludge management plan should provide adequate protection for the groundwater against pollution at the treatment site. Once the sludge is shipped to the landfill, the landfill should be equipped to prevent contamination of the groundwater as well.

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Storage Alternatives

4.2.2.5. Alternative 11 - Additional Winter Storage Lagoon

Since the winter storage capacity will be exceeded by 2045, this alternative proposes constructing an additional winter storage lagoon to provide additional volume. The existing storage lagoon can handle up to 433 total ERUs or 232 additional ERUs. Before this maximum capacity is reached, it is recommended the City construct a second cell with a minimum capacity of 9.4 MG to handle flows up to 2065 or choose a treatment process that allows for surface water discharge. However, it may be beneficial to plan for a larger storage capacity as flows may increase more than anticipated. This alternative entails obtaining permits, engineering design, and the construction of an above-ground lagoon cell. Additional land may need to be purchased as well, if the area owned by the City to the north of the existing lagoons is not big enough. This will also require additional piping and re-configuration to the land application site.

Discharge Alternatives

4.2.2.6. Alternative 12 – Expansion of Land Application Site

For land application treatment, two options will be analyzed:

1. Slow Rate Land Application by Sprinkler Irrigation
2. Soil Aquifer Treatment by Rapid Infiltration

Alternative 12A - Slow Rate Land Application by Sprinkler Irrigation

In slow rate land application, treated wastewater is applied to crops at agronomic rates.

The application of wastewater is controlled by either the hydraulic loading rate or the constituent loading rate. For wastewater with high levels of nutrients (phosphorus and nitrogen) the constituent loading may control how much water can be applied to the crop. You cannot apply more nutrients than the crop can use (nutrient uptake). However, typically for municipal wastewater, the hydraulic loading rate controls the amount of water that can be applied. The water supplied must be able to be stored in the soil in the root zone and be used by the crop through evapotranspiration. If too much water is applied, deep percolation and/or surface runoff occurs. Hydraulic application rate is calculated as follows (IDEQ, 2005).

$$\textit{Hydraulic Application Rate} = \textit{Available Water Holding Capacity of Soil} + \textit{Evapotranspiration Rate of Crop (ET)} - \textit{Average Precipitation}$$

The available water holding capacity of the soil depends on the soil type and is measured in inches of water per inch of soil depth. NRCS soils maps for Tetonia indicate the available water holding capacity of soils near the treatment facility is considered low, with a capacity of about 0.04 inches/inch. Additional information regarding the soils and water holding capacity of soil near the treatment facility can be found in Appendix __.

Evapotranspiration (ET) for a crop mainly depends on the development stage of the crop, temperature, and wind speed. The Idaho Department of Water Resources supplies daily ET data online. The Tetonia Experimental Station shows that the average ET for the growing season for alfalfa in Tetonia is 30.7 inches/year during the growing season based on data from 1941 through 2024 (IDWR, 2024).

By knowing the available water holding capacity of the soil, the ET, and the precipitation, an operator can control irrigation so that the optimum amount of water is supplied to the crop without losing water to runoff or deep percolation. The water accounting method known as the "checkbook" method can be used to balance water deposits (irrigation and precipitation) with water withdrawals (ET). An example spreadsheet showing this method for Tetonia is supplied in Appendix __ based on the gravelly loam soil type, historical ET data and average precipitation from the Tetonia Experimental weather station.

To calculate the acreage that will need to be irrigated to use all of the wastewater produced by Tetonia, the average ET and average precipitation can be used. The water holding capacity of the soil is not needed because it is assumed that the soil is fully saturated at the beginning and end of the irrigation season.

The average annual influent wastewater volume in 2045 is anticipated to be 0.070 MG/day and 0.126 MG/day in 2065. The average ET for the growing season is 30.5 inches per year and the average precipitation for the growing season is 7.42 inches per year from the Tetonia Experimental weather station. Acreage is then calculated as follows:

$$Irrigated\ Area = \frac{Annual\ Flow\left(\frac{gal}{year}\right)}{7.48\ \frac{gal}{ft^3}} * \frac{12\ \frac{in}{ft}}{ET - Precip.} * \frac{1\ acre}{43{,}560\ ft^2}$$

$$= 40.7\ acres\ (in\ 2045)$$

$$= 73.5\ acres\ (in\ 2065)$$

Since the current pivot only covers approximately 29.3 acres (pivot sprinkler length of 638 ft), the City will need to obtain at least an additional 11.4 acres for land application by 2045 and an additional 32.8 acres by 2065. Center pivot sprinklers are about 90% efficient. This would reduce the acreage needed, however for the purposes of this study, 40.7 and 73.5 total irrigated acres will be used for 2045 and 2065 projections, respectively.

A conceptual design for an expansion of the slow rate (i.e. irrigation) land application is presented in Exhibit __. The existing lagoon system would remain in place with the Cell 2 being used for winter storage. During the irrigation season, water from the Cell 2 will continue to be pumped to the existing as well as the proposed center pivot sprinkler system to irrigate crops. The location of the center pivot may change in the future, depending on available property at the time of expansion. If the City elects to pursue this option further, potential sites will need to be investigated and a long-term lease (20-year) secured. It is assumed for the purposes of this study that 10,000 feet (1.9 miles) of 8-inch pressure irrigation pipe would be needed to reach the land application site from the existing pump station.

The existing Reuse Permit from Idaho DEQ allows for up to 42 acres and 45.208 MG/year. Therefore, the existing permit could continue to be used and renewed until 2045. Note that the IDEQ will still be required to be informed and approve the new land application site, even though the current one allows for a higher acreage and volume. By 2065, the City of Tetonia will need to obtain a new or an additional Reuse Permit from Idaho DEQ to use slow rate land application for wastewater disposal. A reuse permit application form is required along with a technical report. The required report is very detailed and must describe the site location and ownership, the proposed land application process, site characteristics, wastewater characterization, cropping plan, loading rates, and site management plan. Detailed plans and specifications must also be submitted to Idaho DEQ for approval prior to construction.

Resources available for the design and permitting of the facility include:

- Process Design Manual – Land Treatment of Municipal Wastewater Effluent (EPA, 2006)
- Wastewater Land Application Operators Study and Reference Manual (IDEQ, 2005)
- Guidance of Reclamation and Reuse of Municipal and Industrial Wastewater (IDEQ, 2007)
- IDAPA 58.01.17 – Rules for the Reclamation and Reuse of Municipal and Industrial Wastewater
- United States Department of Agriculture (USDA)

Alternative 12B - Soil Aquifer Treatment by Rapid Infiltration Basins

The second option for disposing of the wastewater from the Tetonia system is Rapid Infiltration (RI) Basins. RI basins use Soil Aquifer Treatment (SAT) to treat wastewater as it is allowed to percolate through the soil to the aquifer. SAT systems are an especially effective process for BOD, TSS, and pathogen removal and can provide significant removals of nitrogen, phosphorus, metals and trace organics (EPA, 2006). For Tetonia, it is recommended

that the two lagoon cells remain in place. As such, the RI basin would be needed more for disposal than treatment; however, "polishing" of the wastewater effluent by the soil prior to reaching the aquifer will be an added benefit.

Idaho DEQ rules require pretreatment of BOD and Total Nitrogen to 5 mg/L and 10 mg/L respectively prior to discharge to the RI Basin (per IDAPA 58.01.17). The wastewater effluent quality for Tetonia from the lagoon system is higher than the requirement with a BOD levels of 116 mg/L (measured in the transfer station between the treatment and storage lagoon) and with an average total Nitrogen level of 25.7 mg/L (per 2025 Land Application Report).

Typically, sites with shallow ground water are not acceptable for RI basins. According to the NRCS soils report, ground water for most of the area around the treatment facility is greater than 80 inches. If the basins were constructed further south or west, the depth to the ground water table would only be between 0 to 10 inches. If the RI basins were placed where the ground water is shallow, DEQ will require a Water Quality impact analysis to be performed to determine suitability of the site. Depending on the results of the analysis, the site may not be acceptable. The area required for the infiltration basin is determined by the (Calculations are also included in Appendix __. Note that the calculations shown below assume that the existing Land Application Site will no longer be utilized):

1. Wastewater flow rate
2. Percolation Rate of the Soil
3. Wet/Dry Ratio.

1. Wastewater Flow Rate

   The average design flow entering the RI basins is 0.070 MG/day or 25.4 MG annually in 2045 and 0.126 MG/day or 45.8 MG/year in 2065. Although RI basins can be operated year round with careful operation, freeze-up problems can be avoided by not operating during the winter months when a winter storage pond is available. Therefore, for this analysis the basins will receive water for five[19] months during the year. Flow into the lagoons is then calculated as follows:

$$WW\ Flow\ Rate\ (in\ 2045) = \frac{25{,}380{,}086\ gal/year}{\frac{5\ months}{12\frac{months}{year}} * 365\frac{days}{year}} = 166{,}883\frac{gal}{day}$$

[19] Five months is based on the number of months that did *not* have minimum temperatures below freezing based on data from the last three years.

$$WW\ Flow\ Rate\ (in\ 2065) = \frac{45{,}839{,}258\ gal/year}{\frac{5\ months}{12\frac{months}{year}} * 365\frac{days}{year}} = 301{,}409\frac{gal}{day}$$

2. Soil Percolation Rate

   The NRCS soils report (see Appendix A) shows one soil in the area where the basins could be located: the Alpine-St. Anthony complex. This soil is a gravelly to extremely gravelly loam. Saturated Hydraulic Conductivity (K_{sat}) is 0.57 to 1.98 in/hr. For this conceptual design, a K_{sat} value of 0.57 will be used.

   The EPA Process Design Manual for Land Treatment of Municipal Wastewater Effluents (EPA, 2006) recommends, for preliminary design, using a loading rate of 4 to 10% of the K_{sat}. The reduction factor allows for the sealing up of soils over time and for drying time between wastewater applications. In this analysis a reduction of 6%[20] will be used.

   Preliminary design loading rate is calculated as follows:

$$0.57\frac{in}{hr} * 6\% * 24\frac{hr}{day} = 0.82\frac{in}{day}$$

   For final design, soil testing should be performed, which should include backhoe pits, soil borings, and monitoring wells.

3. Wet/Dry Ratio

   Intermittent application is critical to the successful operation of SAT systems (EPA, 2006). Drying time between wastewater applications aids in wastewater treatment and helps prevent the soil from sealing up. A wet/dry ratio of 0.25 will be used for this analysis. Meaning water will be applied to a basin for 1 day and then the basin will be allowed to dry for four days. It should be noted that for purposes of operation, the basins should be oversized to provide some flexibility in the number of days that water can be applied to each basin so water will not need to be changed on the weekends.

4. Area Calculation

   Based on the above information, the RI basin area is calculated as follows:

[20] A reduction factor of 6% indicates that only 6% of the K_{sat} value is being used (equivalent to 94% reduction).

$$RI\ basin\ Area\ (in\ 2045) = 166{,}883\frac{gal}{day} * \frac{ft^3}{7.48\ gal} * \frac{day}{0.82\ in} * \frac{12\ in}{ft} * \frac{acre}{43{,}560\ ft^2}$$
$$= 7.5\ acres$$

$$RI\ basin\ Area\ (in\ 2065) = 301{,}409\frac{gal}{day} * \frac{ft^3}{7.48\ gal} * \frac{day}{0.82\ in} * \frac{12\ in}{ft} * \frac{acre}{43{,}560\ ft^2}$$
$$= 13.5\ acres$$

To achieve a wet/dry ratio of 0.25, at least five basins will be needed in 2045, making each basin at least 1.5 acres. This will continuously allow one basin to receive new wastewater (wet) while the remaining four basins have time to dry (1 wet / 4 dry = 0.25). To ensure the water can infiltrate quickly enough, a basin area of 2.0 acres each will be used, with a total area of 10.0 acres. By 2045, an additional 2 basins, for a total of seven basins will be required (13.5 acres/ 2.0 acre = 7 basins). If the City chooses to plan for 2065 from the start, then the total number for required basins could be reduced to five, however each basin would need to be at least 2.7 acres (13.5 acres/5 basins = 2.7 acres).

A conceptual design for an RI system is shown on Exhibit __. The existing gravity sewer line would be used to take wastewater from the existing Cell 2 to the existing chlorination building. A contact tank (5,000 gallons) will be needed to provide contact time for the chlorination of the wastewater prior to entering the RI system (a UV system may be a feasible alternative to chlorination and should be considered during design.) From the first structure water will flow through an open channel (i.e. ditch) and will be controlled with head-gate style structures in order to divert the water to the various basins. The basins should also have structures between them to allow for overflow from one basin to the next should a basin overfill due to an operation problem.

Five 2.0-acre basins will be used at the first. Water can be directed to each basin for 1 day and the basin can dry for 4 days. Or a 2 day / 8 day sequence can be used. At the design flow, a 2.0-acre basin will fill with 3.1 inches of water in 1 day, or 6.2 inches of water in 2 days. Four-foot-high earthen berms should be sufficient to form the basins. Shallow side slopes and/or rip rap will add erosion protection to the berms. The berms should be wide enough for a vehicle and have a gravel top surface.

Vegetation can be planted in the basins. The local conservation district should be consulted to determine a species that will do well in the RI basin environment.

Three or more monitoring wells will be required. The locations of the wells will be determined with the input from DEQ. Typically, one well is placed upstream of the basins, one near the center of the basins, and one downstream.

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Prior to applying for a permit for an RI basin, the City of Tetonia will need to perform a Water Quality Impact Analysis (WQIA). The analysis is a site performance model where effluent quality and quantity are entered and the potential impacts to ground water quality are analyzed. Monitoring wells will be required for the WQIA and for continued compliance monitoring after the system is constructed.

If the impacts to ground water are determined to be acceptable based on the WQIA, the City will need to obtain a Reuse Permit from Idaho DEQ (same permit as Slow Rate Land Application). A permit application will need to be submitted along with a technical report describing the site and the proposed system. Detailed plans and specifications must also be submitted to Idaho DEQ for approval prior to construction.

Resources available for the design and permitting of the facility include:

- Process Design Manual – Land Treatment of Municipal Wastewater Effluent (EPA, 2006)
- Guidance of Reclamation and Reuse of Municipal and Industrial Wastewater (IDEQ, 2007)
- IDAPA 58.01.17 – Rules for the Reclamation and Reuse of Municipal and Industrial Wastewater
- IDAPA 58.01.11 – Ground Water Quality Rule
- United States Department of Agriculture (USDA)

4.2.2.7. Alternative 13 – Intermittent Sand Filtration

Intermittent (slow) sand filtration is the application of lagoon effluent to a sand filter bed on an intermittent basis. The sand bed is typically 2 to 3 ft deep, with a cover of gravel approximately 6-12 inches deep (Lindeburg, 2018, pp. 29-13). Suspended solids and organic matter are removed through a combination of physical straining and biological degradation as the wastewater passes through the sand filter bed. The organic particulate matter collects in the top 2-3 inches of the filter bed, and the buildup of organic material eventually clogs the filter bed, preventing further passage of the effluent. The sand filter is then taken out of service for the replacement of the media. The spent sand is either discarded, or it can be washed and reused as replacement media.

This treatment process would replace or add to the existing land application to discharge the wastewater during the growing season. A winter storage pond is still required because intermittent discharge of treatment lagoon effluent during winter to the sand filters would ice over the filter beds, rendering them useless. Filter bed effluent would be discharged directly to nearby streams.

Based on research pilot filters in other areas, the intermittent sand filters will treat water for discharge to less than 3 mg/l TSS and less than 1 mg/l BOD. The amounts of phosphorus and ammonia treated would depend on the amount that is in the suspended solids. Sand filters can filter out the solids in the effluent, but anything that is not in the solids would not be treated. Disinfection would also be required for this type of treatment.

Approximately 1 acre of sand filter bed is needed for every 1,000 people (Lindeburg, 2018, pp. 29-13). Based on this approximation, Tetonia would need approximately 1.6 acres and 1.9 acres by 2045 and 2065, respectively.

The Technical Guidance Manual for Individual and Subsurface Sewage Disposal Systems by IDEQ is a resources available for the design and permitting of the facility (IDEQ, 2025).

Intermittent Sand Filtration demands more substantial investments compared to a discharging lagoon with land disposal facility. Furthermore, the operation and maintenance requirements are more time demanding and come with higher operation costs. Operators must diligently monitor the filter efficiency, regularly remove, discard, or clean the spent media, and replace as needed. Due to the elevated costs and the increased expenses associated with operation and maintenance, this alternative does not justify further evaluation for the Tetonia Wastewater System. Intermittent Sand Filtration is not considered as a viable alternative.

4.2.2.8. Alternative 14 - Construction of Wetlands

Constructed wetland treatment is most suitable for project areas situated near existing wetlands. These locations make for ideal candidates due to their proximity to already established wetland conditions. There are two main categories of constructed wetlands: above ground and underground.

Above ground constructed wetlands are built on the surface. It consists of shallow ponds or channels with emergent aquatic vegetation and substrate that support wetland plant growth.

Underground constructed wetlands are located below the ground surface. It is essentially a subsurface flow system where wastewater is treated as it flows through gravel beds or other porous media planted with wetland vegetation.

A constructed wetland releases its treated water consistently throughout the year into a nearby stream, river, lake, or an evapotranspiration pond. Wetland discharge would necessitate obtaining proper permits to meet required BOD and TSS removal levels before releasing the treated water.

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There are no wetlands in close proximity to the existing wastewater treatment facility. The closest streams are Spring Creek to the south and an intermittent stream (called "Teton River - Cache Bridge to Highway 33 bridge") to the east and north of the treatment site.

4.2.2.9. Alternative 15 - Discharge Treated Water to Surface Water

In the current condition, the City is operating under a discharge to a land application site via a sprinkler system. This alternative proposes the City discharge to surface water instead. The lagoons act as treatment and storage and could discharge to a nearby river or stream if treated to the proper effluent discharge requirements. Typically, as with land application sites, discharge to surface water would have limitations in the winter months as well. With Spring Creek being approximately 1,120 ft south of the existing treatment site, this could be an option if additional land cannot be acquired in the future to provide more capacity for the effluent. The intermittent stream that connects Spring Creek and eventually the Teton River, may also be a viable location for discharging the effluent. This stream is located less than 700 ft northeast of Cell 2. However, depending on how stringent the effluent discharge limits are, the City may not be able to meet the requirements and would need to look at other options of treatment for the wastewater before it can be discharged.

4.2.2.10. Alternative 16 - No-Action to Treatment Facility Alternative

The No-Action alternative would leave the system as it is. Taking no action will likely results in:

1. Insufficient winter storage to buffer between land application periods.
2. Insufficient treatment capacity in the future.

Insufficient winter storage could force the system to take emergency measures in the future to drawdown the system by discharging to the environment. Insufficient treatment capacity in the future could lead to permit violations and environmental risks, as water that is not treated enough could be applied to the pivot. This could potentially cause IDEQ to revoke the Reuse Permit and charge the City with fines.

The no-action alternative has no capital expenses incurred initially. However, no-action now may result in a system failure that would be much more expensive to address later on. Because the recommended improvements have an outsized benefit relative to their low cost, the no-action alternative is not advised.

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4.3. Optimum Operation of Existing Facilities

A fairly simple lagoon system such as the Tetonia system operates with relatively little input from operators. However, since the existing facilities do not have correct flow metering and operator staffing has been an issue in the past, optimum operation should be improved through improved monitoring as discussed in Section 4.2.1.2 as well as SCADA improvements as discussed in Section 0. Since the City is not currently using any chemicals to reduce sludge buildup in the treatment lagoon, it is recommended to add chemicals as the flows get closer to the lagoon's treatment capacity. This option was previously discussed as part of Section 4.2.2.4.

4.4. Regionalization

The nearest city with a public sewer system is the City of Driggs, which is located approximately 6 miles southeast of Tetonia. Regionalization is not expected to benefit either community, as a long trunkline as well one or multiple lift stations would need to be constructed. Both cities currently have their own systems and treatment facilities. Driggs has had several violations at their treatment plant since it was constructed, and the City of Driggs is planning to build a new treatment plant in the near future. However, considering the current violations of the Driggs treatment facility, additional wastewater flows from Tetonia would expect to exceed the system capacity.

4.5. System Classification and Operator Licensure

The alternatives that would affect the system classification and operator licensure are the Intermittent Sand Filtration, Mechanical Treatment Plant, and STM Treatment Process Alternatives. If the City chooses to pursue any of these projects, proper operator training or hiring of additional operators will be necessary, prior to the start of operation.

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5. Final Screening of Principal Alternatives

Sunrise Engineering has completed a thorough review of the City of Tetonia's wastewater system, which includes looking at the existing and future flows based on the growth projections. After identifying possible improvements to address the system deficiencies described in Section 4.2, this section groups those improvements into prioritized project categories for collection system improvements and ranks treatment facility projects.

These alternatives will be evaluated based on their urgency, how they address system deficiencies, impacts to the sewer system, costs, and environmental impacts. Therefore, all collection system alternatives have been categorized based on the severity of the deficiency or the timeline for needed improvements. Priority 1 includes improvements requiring immediate attention. Priority 2 includes projects intended to maintain proper system function. Priority 3 includes improvements that support the City's growth and provide future capacity. Table 5-1 lists each previously identified collection system project and its assigned priority based on the ranking criteria described in this section.

Table 5-1 Priority Rankings of Collection System Alternatives

Development Alternative		Priority
Collection System Alternatives		
1	Cleaning and Video Inspection	2
2	Monitoring Improvements	
2A	Sample Testing	2
2B	Improving SCADA	2
3	Lift Station Improvements	
3A	Recommended LS Improvements from Annual LS Report	1
3B	Non-Clog Pump	3
3C	Upsizing Wet Well for Future Flows	3
4	Pipe Improvements	
4A	Pipeline Maintenance	
	Rating 5 Pipes	1
	Rating 4 Pipes	1
	Rating 3 Pipes	2
4B	Pipeline Repair	
	Rating 5 Pipes	1
	Rating 4 Pipes	1
	Rating 3 Pipes	2
4C	Pipeline Replacement	3

Development Alternative		Priority
Collection System Alternatives		
5	Manhole Improvements	
5A	Manhole Inventory	2
5B	Manhole Repairs	2

The treatment facility alternatives were organized according to the order in which the improvements must be implemented based on treatment, storage, or discharge capacity. Table 5-2 lists the evaluation criteria, the number of ERUs at which capacity is exceeded, and the required action for each.

Table 5-2 Screening of Required Actions based on Capacity

Step	Criteria	Capacity Exceeded when # of ERUs reaches	Required Action
1	Oxygen Supply & Demand (Treatment)	289	Install new aerator
2	Flow Capacity (Min. # of Required Cells)	339	Construct new treatment cell[21]
3	Storage Capacity of Winter Storage	433	Construct new winter storage cell[21]
4	Water Balance (Discharge)	587	Acquire additional land application area[21]
5	Lift Station Wet Well Capacity	591	Upsize the Wet Well[22]
6	Gravity Pipe d/D < 70% (Sewer Main to LS)	707	Upsize sewer main trunkline to Lift Station[22]
7	Gravity Pipe q/Q < 70% (Sewer Main to LS)	707	
8	Hydraulic Detention Time (Treatment Cell)	849	Construct new treatment cell (addressed in step 2)

The proposed alternatives described in Section 4.2.2 are ranked in the following table from most recommended to least recommended. Table 5-2 should be utilized to determine the order in which these improvements should be implemented. The highest-ranked alternative is assigned a ranking of 1, with lower-ranked alternatives assigned higher numerical rankings in descending order of recommendation.

[21] If the City elects to construct a mechanical wastewater treatment plant rather than expand the existing lagoon and land application system, the project would involve construction a treatment plant instead of adding lagoon cells or land application areas.

[22] This is included in the "Collection System" alternatives.

Table 5-3 Rankings of Treatment Facility Alternatives

Development Alternative		Ranking
	Increase Treatment Capacity (Steps 1 & 2)	
7	Additional Aerator	1
8	Additional Aerated Treatment Lagoon	1
9	Mechanical Treatment Plant	
9A	Conventional Mechanical Treatment Plant	2
9B	STM Rotor Treatment Plant	3
10	Sludge Handling and Disposal	1
	Increase Winter Storage Volume[23] (Step 3)	
11	Additional Winter Storage Lagoon	1
	Increase Discharge Volume (Step 4)	
12	Expansion of Land Application Site	
12A	Slow Rate Land Application by Sprinkler Irrigation	1
12B	Soil Aquifer Treatment by Rapid Infiltration Basins	2
13	Intermittent Sand Filtration	3
14	Construction of Wetlands	4
15	Discharge Treated Water to Surface Water[24]	3

Treatment Option 1 (in order of events):

1. Install Additional Aerator (Alt 7)
2. Sludge Handling and Disposal (of Existing Treatment Lagoon) (Alt 10)
3. Construct additional Aerated Treatment Lagoon (Alt 8)
4. Construct additional Winter Storage Lagoon (Alt 11)
5. Develop additional Slow Rate Land Application By Sprinkler Irrigation Site (Alt 12A)

Treatment Option 2:

1. Keep steps 1-4 the same as in Option 1
5. Develop Soil Aquifer Treatment by Rapid Infiltration Basins (Alt 12B)

[23] Additional winter storage volume is required unless a mechanical treatment plant is constructed and wastewater is stored or discharged by other methods, such as underground infiltration beds or other discharge options allowed for adequately treated effluent.

[24] Discharge to surface water would only be feasible if a higher level of treatment is implemented, such as a mechanical treatment plant, intermittent sand filtration, or constructed wetlands, because surface water discharge requires a significantly greater degree of treatment than a lagoon system can provide.

Treatment Option 3:

1. Construct Conventional Mechanical Treatment Plant (Alt 9A)
2. Discharge Treated Water to Surface Water (to nearby Spring Creek) (Alt 15)

5.1. Evaluation of Costs

This section will establish a dollar value for each proposed improvement. Engineer's opinion of probable costs have been prepared projecting the cost to design and construct the alternatives. Material and contractor installation process have been prepared using Sunrise Engineering's historical project bid tabulations for similar type projects.

As described in the previous section, there are three different categories associated with the collection system improvements projects which rank the projects in order of priority. Costs for each alternative have been developed, and the capital costs of each Category are summarized in the following tables. Detailed cost estimates for each alternative are included in Appendix ___.

Priority 1 improvements are of the highest priority and should therefore be implemented first. Potential funding opportunities, outlined in Section 0, may help address some of these necessary improvements and upgrades.

5.1.1. Collection System Costs:

High Priority (Priority 1) Collection System Alternatives:

Collection System Improvements			
Alt	**Priority 1 Improvements**	**Capital Costs**	
3	Lift Station Improvements		
3A	Recommended LS Impr. from Annual LS Report	$	9,762
4	Pipe Improvements		
4A	Pipeline Maintenance		
	Rating 5 Pipes	$	100
	Rating 4 Pipes	$	696
4B	Pipeline Repair		
	Rating 5 Pipes	$	177,436
	Rating 4 Pipes	$	355,500
	Total Cost of Priority 1 =	**$**	**543,494**

Medium Priority (Priority 2) Collection System Alternatives:

Collection System Improvements			
Alt	**Priority 2 Improvements**	**Capital Costs**	
1	Cleaning and Video Inspection	$	46,581
2	Monitoring Improvements		
2A	Sample Testing	$	2,400
2B	Improving SCADA	$	35,000
4	Pipe Improvements		
4A	Pipeline Maintenance		
	Rating 3 Pipes	$	5,285
4B	Pipeline Repair		
	Rating 3 Pipes	$	1,098,654
5	Manhole Improvements		
5A	Manhole Inventory	$	6,840
5B	Manhole Repairs	$	8,360
	Total Cost of Priority 2 =	**$**	**1,203,120**

Future (Priority 3) Collection System Alternatives:

Collection System Improvements			
Alt	**Priority 3 Improvements**	**Capital Costs**	
3	Lift Station Improvements		
3B	Non-Clog Pump	$	5,464
3C	Upsizing Wet Well for Future Flows	$	745,338
4	Pipe Improvements		
4C	Pipeline Replacement	$	440,377
	Total Cost of Priority 3 =	**$**	**1,191,179**

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5.1.2. Treatment Facility Costs:

Treatment Option 1:

Treatment Facility Improvements		
Alt	**Treatment Option 1**	**Capital Costs**
	Increase Treatment Capacity (Steps 1 & 2)	
7	Additional Aerator	$ 29,077
8	Additional Aerated Treatment Lagoon	$ 2,412,523
10	Sludge Handling	
	Chemicals (Option 1)	$ 11,025
	Sludge Aerating (Option 2)	$ 21,000
	Sludge Dredging (Option 3)	$ 599,400
	Step 1 & 2 Total =	**$ 3,073,026**
	Increase Winter Storage Volume (Step 3)	
11	Additional Winter Storage Lagoon	$ 3,247,781
	Step 3 Total =	**$ 3,247,781**
	Increase Discharge Volume (Step 4)	
12	Expansion of Land Application Site	
12A	Slow Rate Land Application by Sprinkler Irrigation	$ 3,346,928
	Step 4 Total =	**$ 3,346,928**
	Total Cost of Treatment Option 1 =	**$ 9,667,734**

Treatment Option 2:

Treatment Facility Improvements		
Alt	**Treatment Option 2**	**Capital Costs**
	Increase Treatment Capacity (Steps 1 & 2)	
	Alt 7, 8, and 10 Total from Option 1 =	**$ 3,073,026**
	Increase Winter Storage Volume (Step 3)	
	Alt 11 Total from Option 1 =	**$ 3,247,781**
	Increase Discharge Volume (Step 4)	
12	Expansion of Land Application Site	
12B	Soil Aquifer Treatment by RI Basins (2065)	$ 4,429,313
	Step 4 Total =	**$ 4,429,313**

Total Cost of Treatment Option 2 =	**$ 10,750,119**

Treatment Option 3:

Treatment Facility Improvements		
Alt	**Treatment Option 3**	**Capital Costs**
9	Mechanical Treatment Plant	
9A	Conventional Mechanical Treatment Plan*	$ 18,169,668
	Total Cost of Treatment Option 3 =	**$ 18,169,668**

*Discharge is included in off-site improvements of Treatment Plant Estimate

5.2. Present Worth Analysis

A present worth analysis was completed on each of the three collection system improvement priority projects and the three treatment facility improvement options. The present worth analysis was completed assuming the IDEQ interest rate for non-disadvantaged systems of 2.25% and a 20-year loan[25]. Table 5-4 shows the results of the calculations, assuming a 20-year loan at an interest rate of 2.25%.

Table 5-4 Present Value Analysis of Alternatives

Improvement Category	Capital Cost	Annual Payments (with 2.25% interest over 20 years)	Total Cost of Loan (2.25% interest included)	Interest Paid
Collection System Improvements				
Priority 1	$ 543,494	$ 34,046	$ 680,912	$ 137,418
Priority 2	$ 1,203,120	$ 75,366	$ 1,507,318	$ 304,199
Priority 3	$ 1,191,179	$ 74,618	$ 1,492,358	$ 301,179
Treatment Facility Improvements				
Treatment Option 1	$ 9,667,734	$ 605,607	$ 12,112,138	$ 2,444,404
Treatment Option 2	$ 10,750,119	$ 673,410	$ 13,468,195	$ 2,718,075
Treatment Option 3	$ 18,169,668	$ 1,138,186	$ 22,763,712	$ 4,594,045

[25] Interest rate and length of loan are based on phone call with IDEQ on 5/21/2026. A "disadvantaged" system would receive a 2.50% rate over a 30-year loan.

5.3. Capital Costs and Financing Plan

Capital costs of the alternatives was shown in Error! Reference source not found. above. The City has several options to fund the recommended improvements, including grants, loans, increasing user rates, and phasing the projects. Grants are available through USDA Rural Development, Idaho Community Development Block Grant, and the US Army Corps of Engineers. Grant funding is very competitive and is typically scored on a needs base. USDA-RD chooses their funding recipients based on the community's population and median household income (MHI). Idaho Commerce selects their recipients based on whether the project would benefit at least 51% of low-and—moderate income (LMI) persons. Due to the City of Tetonia having a fairly high median household income, it is unlikely the City would qualify for a grant from USDA-RD or Idaho Commerce. The Army Corps of Engineers does not have any specific selection criteria but is typically in coordination with other funding agencies. Therefore, the City will more likely qualify for loan funding and very limited grant funding.

IDEQ is one of the funding agencies that is available to provide loans for wastewater improvement projects. One of the requirements of these loans is to have a Capital Improvement Fund. Monthly contributions to this fund will need to be made such that 10% of the capital costs are available by the halfway point of the loan. For example, if the loan amount is $10,000 over 30 years, the fund needs to have $1,000 by the 15-year mark. To account for contributions to this fund the amount needed is spread out monthly over 15 years.

The USDA Rural Development can provide loans with a market interest rate of 4.75% and systems may qualify for reduced rates if their median household income is low (USDA Rural Development, 2026). Partial grants may be obtained, depending on the median household income of the area.

Potential funding sources are discussed in further detail in Section 0 of this report, along with a cash flow analysis attached in Appendix ___. If the City were to try and fund the projects through a loan, the rates would need to be increased. An immediate increase to $__ per month with an annual increase of $___ for the life of the loan should be sufficient to finance all collection system improvement projects as well as Treatment Option 1.

5.4. Operation and Maintenance Costs

Operation and maintenance costs will largely remain the same regardless of which alternative or option is selected. Cleaning and video inspection will be used for informational purposes and will help determine if and where other improvements may be needed over time. The more frequent cleaning of the pipes is necessary to help reduce the amount of buildup in the pipes and manholes. The lagoon system requires relatively low maintenance, when compared to a conventional wastewater treatment plant. The addition of one or multiple new lagoon cells will increase the cost of operation. However, if the City selects Treatment Option 3 and construct a conventional treatment

plant, then the operation cost of the facility will greatly impact the overall operation and maintenance costs. This would also require a licensed treatment operator be hired to run the plant. Typically, operation and maintenance costs make up approximately 1.5% annually of the capital cost of the treatment plant.

5.5. Energy Costs

The energy demand on the wastewater system is relatively low. The only places that require power are the lift station, the headworks building, and the chlorination building where the pump to the land application site is also situated at. The projects that are anticipated to impact energy use are:

- Alternative 7: additional aerator with 5hp motor
- Alternative 8: additional aerators in new treatment lagoon
- Alternative 9: new treatment plant requires several pieces of equipment and 1 or 2 new buildings with energy demands
- Alternative 12: new pump and controls for additional land application site

Power costs for most projects would be fairly minimal, except for Alternative 9. A 0.12 MGD treatment plant will consume significantly more energy than a lagoon system.

5.6. Cost Comparison of Alternatives

An Engineer's Opinion of Probable Costs (EOPC) was prepared for each of the improvements listed above. The EOPCs can be found in Appendix ___ and are summarized below in Table 5-5 and Table 5-6.

Table 5-5 Cost Comparison of Collection System Improvements

Collection System Improvements			
Alternative		Cost	
1	Cleaning and Video Inspection	$	46,581
2A	Sample Testing	$	2,400
2B	Improving SCADA	$	35,000
3A	Recommended LS Impr. from Annual LS Report	$	9,762
3B	Non-Clog Pump	$	5,464
3C	Upsizing Wet Well for Future Flows	$	745,338
4A	Pipeline Maintenance	$	6,081
4B	Pipeline Repair	$	1,631,590
4C	Pipeline Replacement	$	440,377
5A	Manhole Inventory	$	6,840

5B	Manhole Repairs	$	8,360
6	No Action	$	0
Total Cost of Collection System Improvements =		**$**	**2,937,793**

Table 5-6 Cost Comparison of Treatment Facility Improvements

Treatment Facility Improvements			
Alternative		**Cost**	
7	Additional Aerator	$	29,077
8	Additional Aerated Treatment Lagoon	$	2,412,523
9A	Conventional Mechanical Treatment Plant	$	18,169,668
10	Sludge Handling and Disposal (Option 1)	$	11,025
10	Sludge Handling and Disposal (Option 2)	$	21,000
10	Sludge Handling and Disposal (Option 3)	$	599,400
11	Additional Winter Storage Lagoon	$	3,247,781
12A	Slow Rate Land App. by Sprinkler Irrigation	$	3,346,928
12B	Soil Aquifer Treatment by RI Basins (2045)	$	3,163,795
12B	Soil Aquifer Treatment by RI Basins (2065)	$	1,265,518
16	No Action	$	0
Total Cost of Treatment Facility Improvements =		**$**	**32,266,715**

Costs were not developed for the following alternatives:

- Alt 9B - STM Rotor Treatment Plant
- Alt 13 - Intermittent Sand Filtration
- Alt 14 - Construction of Wetlands
- Alt 15 - Discharge Treated Water to Surface Water

5.7. Consideration of Impacts to Water Supply System

None of t proposed improvements would significantly impact the current water distribution system.

5.8. Communities Ability to Implement Project(s)

The City of Tetonia is capable of implementing all collection system alternatives and treatment facility projects, given that funding becomes available and user rates increase. Due to the large projects such as constructing an additional treatment lagoon, an additional winter storage lagoon, and expanding the land application site will be necessary as the City grows, it is recommended the City revise their impact fees to proposed development. These fees are necessary to provide the funds to

construct these facilities without it being the responsibility of the currently small town of Tetonia. The No-Action alternatives keep the system operating as is, however these are not recommended.

5.9. Evaluation of Environmental Impacts

Each project has varying levels of environmental impact. A summary of the anticipated impacts of each project is shown in the "Environmental Screening Table" in Appendix ___. The Environmental Determination from IDEQ is also provided in Appendix __.

5.10. Recommended Alternative

Based on the analysis of the City of Tetonia Wastewater System, Sunrise Engineering recommends collection system Priority 1 improvements be implemented as soon as possible, followed by Priority 2 projects. SE also recommends Treatment Option 1 be implemented as the number of ERUs increases as shown in Table 5-2.

5.11. Potential Funding Sources

Cities have two methods to legally accrue debt on a water system. The first method is through the sale of bonds, authorized through bond elections or local improvement districts. The second method requires a ruling by a judge. This method is known as judicial confirmation.

Seven funding options are available to the City of Tetonia. These sources are:

1. Idaho Commerce
2. USDA Rural Development (USDA-RD)
3. US Army Corp of Engineers (USACE)
4. US Bureau of Reclamation (USBR)
5. Idaho Department of Environmental Quality (IDEQ)
6. Typical Bank Loan

Grant money is available through Idaho Commerce, USDA-RD, USACE, and USBR. Each funding agency rates and ranks each application based on its specific criteria. Grant funding is very competitive due to the number of applications received each year. Grant requests often outweigh the funds available. The Revolving Loan Fund does offer principal forgiveness on their loans depending on the funds available. Principal forgiveness also is competitive and is only granted to the most deserving based on their specific criteria.

All funding agencies have their own criteria and methods for ranking applications. Listed below are some of the critical funding criteria for each agency.

Idaho Commerce - Idaho Community Development Block Grant (ICDBG)

- Project must benefit at least 51% low-and-moderate-income (LMI) persons
- Provides grant money only.
- Applicants are required to match at least ICDBG's grant with their contribution.
- Allow sweat equity as a city contribution.
- Maximum grant allowance of $500,000.
- Requires Davis-Bacon wages to be paid on the project.
- Certified Funds administer recommended to oversee Davis-Bacon requirements and Financial Reporting (typically Southeastern Idaho Council of Governments, SICOG).
- SICOG will charge an additional 3-5% (of total grant amount) fee for funding administration.
- Contact (SICOG):
    - Nate Mortimer (Community Development Specialist) [phone redacted] ext. 1019
- Contact (Idaho Commerce):
    - Idaho CDBG team [phone redacted]

USDA Rural Development (USDA – RD)

- Provides loan and grant money.
- Eligibility based on population and median household income.
- City of Tetonia may be eligible for:
    - Water & Waste Disposal Loan & Grant Program in Idaho
- To qualify for poverty rate, median household income (MHI) must be below 80% of the state nonmetropolitan median household income (NHI).
    - City of Tetonia does NOT qualify
- Project funded by this fund must comply with Build America, Buy America (BABA) provisions
- Requires individual meters on every connection in the system.
- Loans have an interest rate of 4.750% as of April 1, 2026. Rates are market rates and change quarterly.
- Loans have a term of up to 30 years if just loan or 40 years if used with a Rural Development grant.
- Must use RD loan money to qualify for grant money.
- Bond capacity must be made out for 100% of project cost in the event grant funding is unavailable.
- Grant can only be given after all other funding sources are exhausted.
- Requires an environmental report and a preliminary engineering report
- Use "RD Apply" to submit application.

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- Contacts:
  - Taylor Pratt (Area Director)
    [phone redacted]
  - Adam Hadley (Community Program Specialist)
    [phone redacted]

US Army Corp of Engineers – Section 595 Program

- Provides grant money
- Typically, will not fund the entire project
- Costs are shared 75% federal and 25% sponsor (non-federal)
- Must provide Davis Bacon Wages
- No BABA or AIS requirements
- Ranks projects in coordination with other funding agencies
  - Not based on income level or population
- Often used as "gap" funding to lower user rates
- Only have funding when there is a president's budget – resets annually
- Apply by sending letter/email to Karen L Kelly (see contact below) including:
  - Project description
  - Project time frame
  - Project cost
  - What the grant money would be used for
- Contact:
  - Karen L Kelly
    [phone redacted]
    karen.l.kelly@usace.army.mil

Idaho Department of Environmental Quality (IDEQ) – State Revolving Loan Fund (SRLF)

- Provide loan money only.
- Principle forgiveness may be given if qualifications are met (based on Median Household Income (MHI), employment, etc.).
- Loans are given at a 2.25% interest rate for non-disadvantaged communities with a length of loan of 20 years and 2.50% for disadvantaged communities with a 30-year loan. Rates are adjusted annually, with the fiscal year beginning in July.
  - Considered disadvantaged community if water user rates exceed 2% of MHI (of City of Tetonia).
- Must accumulate reserves - have 10 years to build up funds to repay 1 year payment.
- Requires a capital improvement fund in addition to the loan.
- Requires either judicial confirmation or a bond election.

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- Project funded by this fund must comply with Build America, Buy America (BABA) provisions – Planning Design Waiver may be applied if project planning started prior to May 2022
- Must comply with American Iron & Steel (AIS)
- Must provide Davis Bacon Wages
- Contact:
    - Charlie Parkins (Grants and Loans Supervisor)
      [phone redacted]

The best funding option for the City of Tetonia is to obtain a grant from ICDBG, USDA-RD, or from the US Army Corps of Engineers. If a grant cannot be awarded, the second-best option would be to obtain a loan either from the IDEQ State Revolving Loan Fund or USDA-RD.

5.12. Land Availability

The following alternatives will require additional land:

- Alternative 8: Additional Aerated Treatment Lagoon (~2.7 acres)
- Alternative 9 (9A or 9B): Mechanical Treatment Plant (~7 acres)
- Alternative 11: Additional Winter Storage Lagoon (~4.3 acres)
- Alternative 12A: Slow Rate Land Application by Sprinkler Irrigation (~45 ac land app + area around that is outside of pivot for a total of ~60.5 acres)
- Alternative 12B: Soil Aquifer Treatment by Rapid Infiltration (~15 acres (for 2045) and ~21 total acres (for 2065))

The City owns a total of 20 acres on which the existing lagoon system is located. Additional undeveloped land north of the existing lagoon treatment site could provide approximately 11 more acres, which would be sufficient for the new treatment and winter storage lagoon. This area would also be suitable for a conventional treatment plant. Additional land will need to be acquired for the land application site or rapid infiltration basins. All other projects will be completed on land owned by the City of Tetonia.

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6. Public Participation

This section will be updated if/when documentation of a public meeting being held is available before a particular alternative has been officially selected by the City.

The Technical Draft of the Wastewater Facilities Planning Study was uploaded to the City of Tetonia website, and a physical copy was provided at the Tetonia City Office to allow the public to review the document and provide public comment. An announcement was made in the local paper on August 13th, 2026, and posted online to notify the public. The announcement is included in Appendix ___. A Public Comment Meeting was held as part of the City Council Meeting at the Tetonia City Office on Wednesday, August 27th, 2026. Sunrise Engineering presented the study and its proposed alternatives to Council and the public. The public had 2 weeks prior to the comment meeting to review the study, therefore the public comment period ended on Wednesday, September 10th, 2025.

A single public comment was provided following the presentation, when the public had the opportunity to ask questions and provide comments. The comment expressed _____. This comment was addressed, and no other public comments were received by the City of Tetonia regarding this study.

Following public comments at the meeting, Council made a motion to approve the Wastewater Facilities Planning Study and the recommended alternatives presented in the report. The meeting minutes are provided in Appendix __.

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Exhibits

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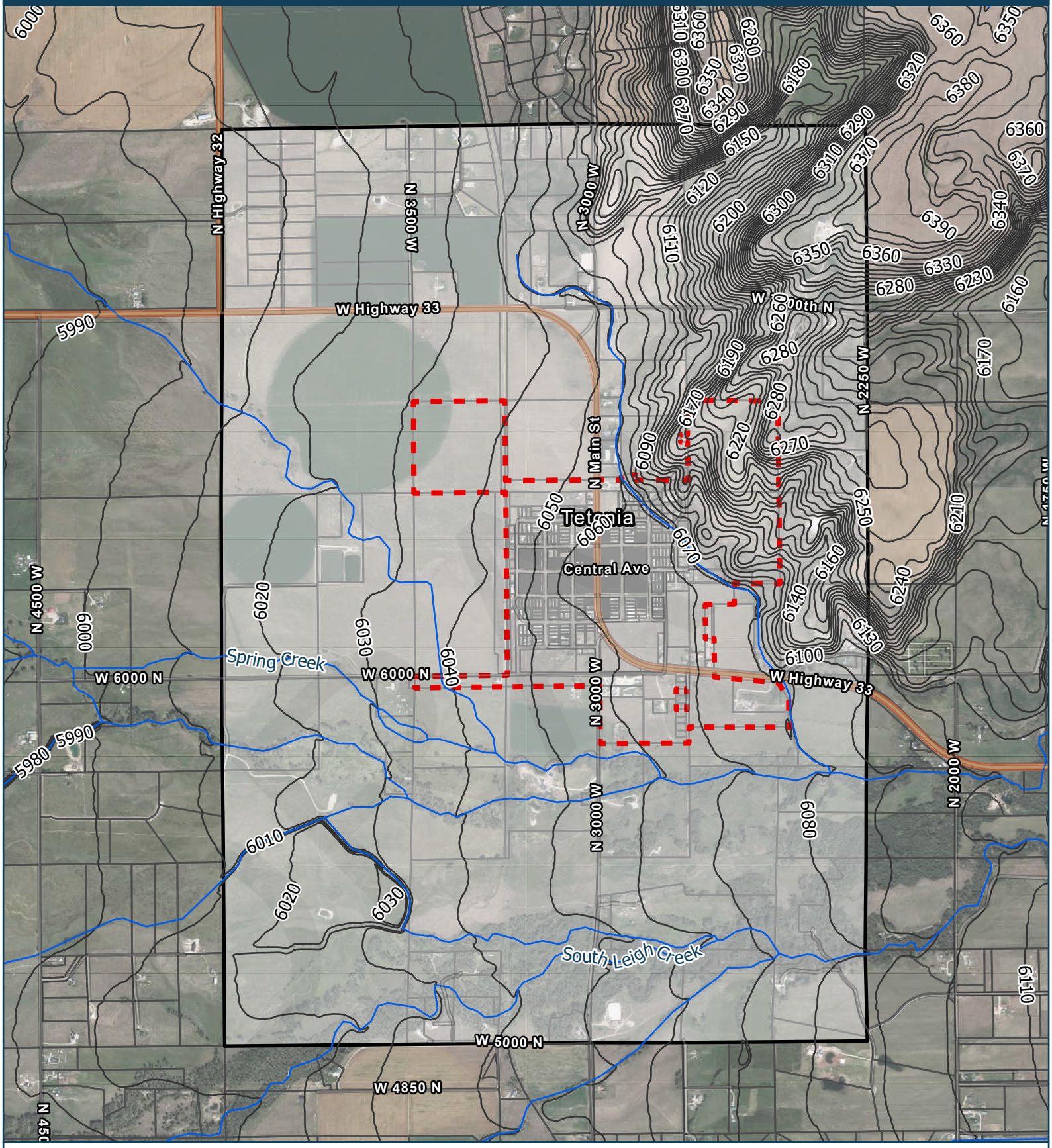
CITY OF TETONIA | EXISTING TOPOGRAPHY



LEGEND

- TETONIA CITY LIMITS
- TETONIA IMPACT AREA (PROJECT PLANNING AREA)
- TETON COUNTY PARCELS
- RIVER/STREAM
- 10' CONTOUR INTERVAL

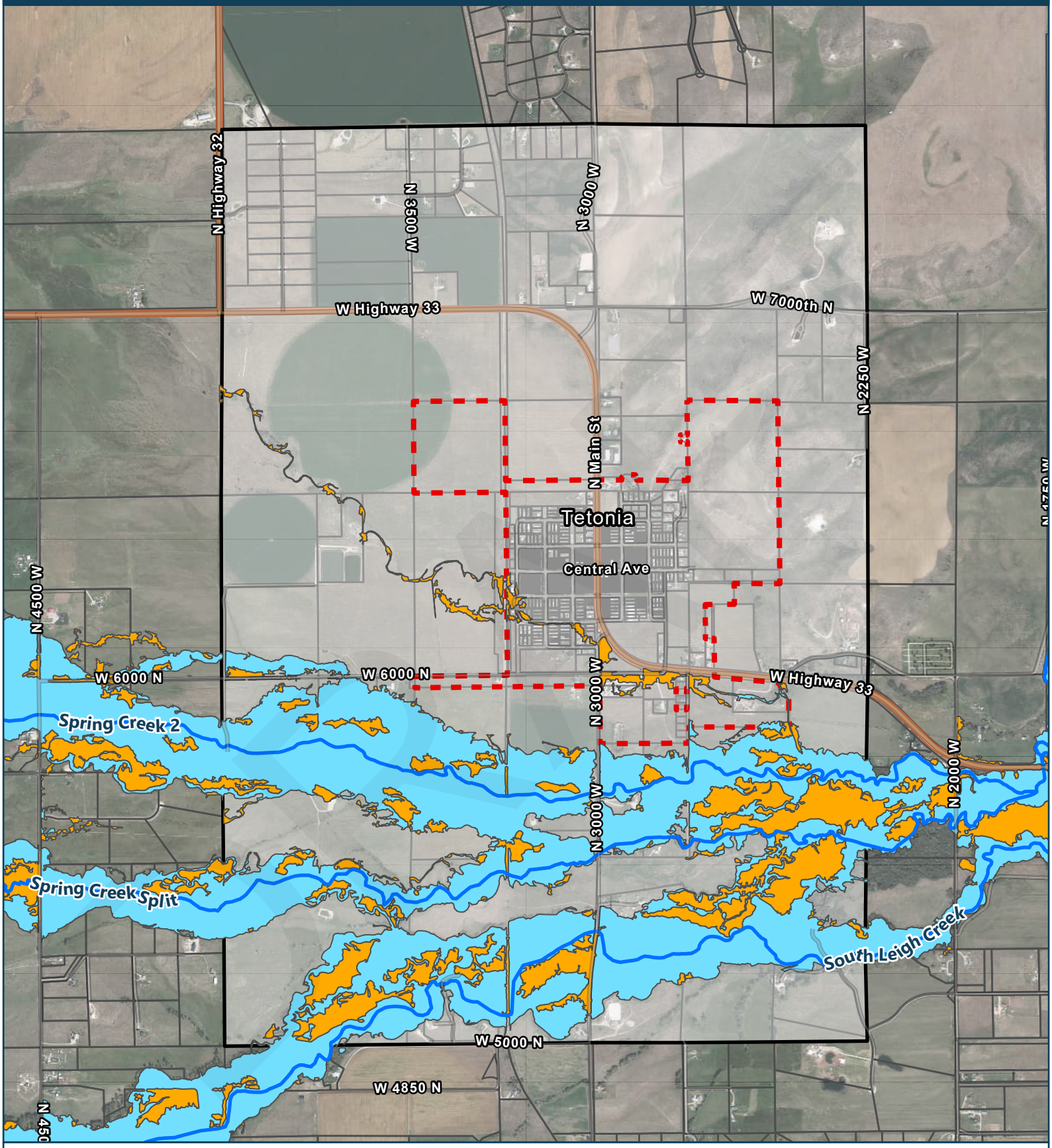
LAST UPDATED ON: 9/29/2025
CREATED BY: LAURA RADKE, PE

0 0.25 0.5 Miles

SUNRISE ENGINEERING

EXHIBIT 1

CITY OF TETONIA | PRELIMINARY FLOODPLAINS



LEGEND

- FLOWLINE

FEMA FLOOD ZONE

- ZONE A (WITHOUT BFE)
- ZONE X (500-YEAR FLOOD)
- TETONIA CITY LIMITS
- TETONIA IMPACT AREA (PROJECT PLANNING AREA)
- TETON COUNTY PARCELS

LAST UPDATED ON: 9/29/2025
CREATED BY: LAURA RADKE, PE

0 0.25 0.5 Miles

SUNRISE ENGINEERING

EXHIBIT 2

CITY OF TETONIA | EXISTING WASTEWATER SYSTEM OVERVIEW

EXHIBIT ##



3/12/2026

CITY OF TETONIA | OPERATIONAL PIPE CONDITION OVERVIEW

EXHIBIT ##

LEGEND

- MANHOLE
- LIFT STATION
- LAGOON
- PRESSURE SEWER PIPE

OPERATIONAL CONDITION OF GRAVITY SEWER PIPE

- GOOD (<3)
- MODERATE (3)
- SEVERE (4)
- MOST SEVERE (5)
- NO VIDEO

0 0.025 0.05 0.1 Miles

SUNRISE ENGINEERING

MH-2 MH-3 MH-4 MH-5 MH-6 MH-7 MH-8 MH-9 MH-10 MH-11 MH-12 MH-13 MH-14 MH-15 MH-16 MH-17 MH-18 MH-18B MH-19 MH-20 MH-21 MH-22 MH-23 MH-24 MH-25 MH-26 MH-27 MH-28 MH-29 MH-30 MH-31 MH-32 MH-33 MH-34 MH-35 MH-36 MH-37 MH-38 MH-39 MH-40 MH-41 MH-42 MH-43 MH-44 MH-45 MH-45B MH-46 MH-47 MH-48 MH-49 MH-50 MH-51 MH-52 MH-53 MH-54 MH-55 MH-55B MH-56 MH-57 MH-58 MH-59 MH-60 MH-61 MH-62 MH-63 MH-64 MH-65 MH-66 MH-67 MH-68 MH-69 MH-70 MH-71 MH-72 MH-73 MH-74 MH-75 MH-76 CO-1 CO-2 CO-3 PS

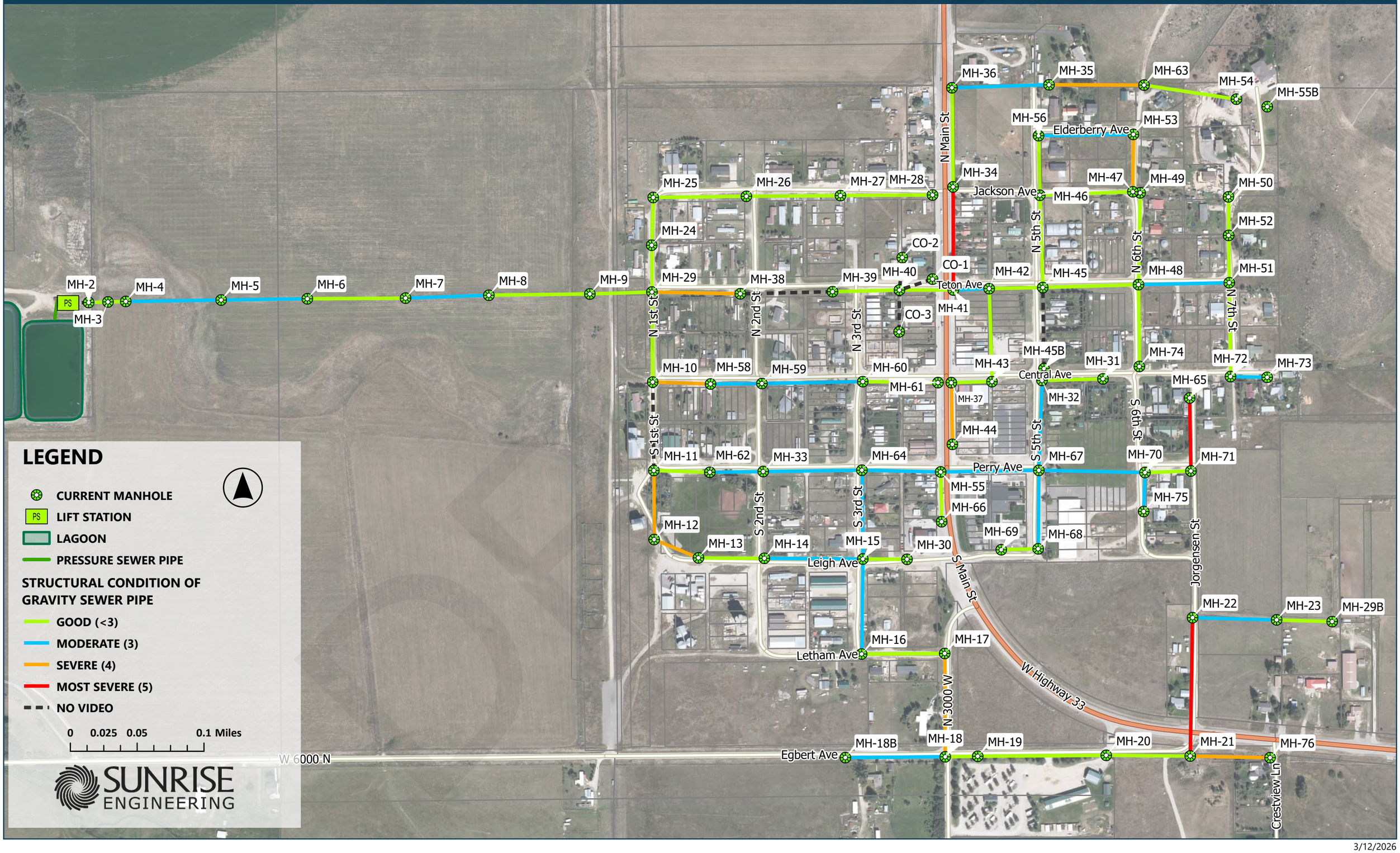
N Main St S Main St N 1st St S 1st St N 2nd St S 2nd St N 3rd St S 3rd St N 5th St S 5th St N 6th St S 6th St N 7th St Jorgensen St N 3000 W

Jackson Ave Elderberry Ave Teton Ave Central Ave Perry Ave Leigh Ave Letham Ave Egbert Ave W Highway 33 W 6000 N Crestview Ln

3/12/2026

CITY OF TETONIA | STRUCTURAL PIPE CONDITION OVERVIEW

EXHIBIT ##



LEGEND

- CURRENT MANHOLE
- PS LIFT STATION
- LAGOON
- PRESSURE SEWER PIPE

STRUCTURAL CONDITION OF GRAVITY SEWER PIPE

- GOOD (<3)
- MODERATE (3)
- SEVERE (4)
- MOST SEVERE (5)
- NO VIDEO

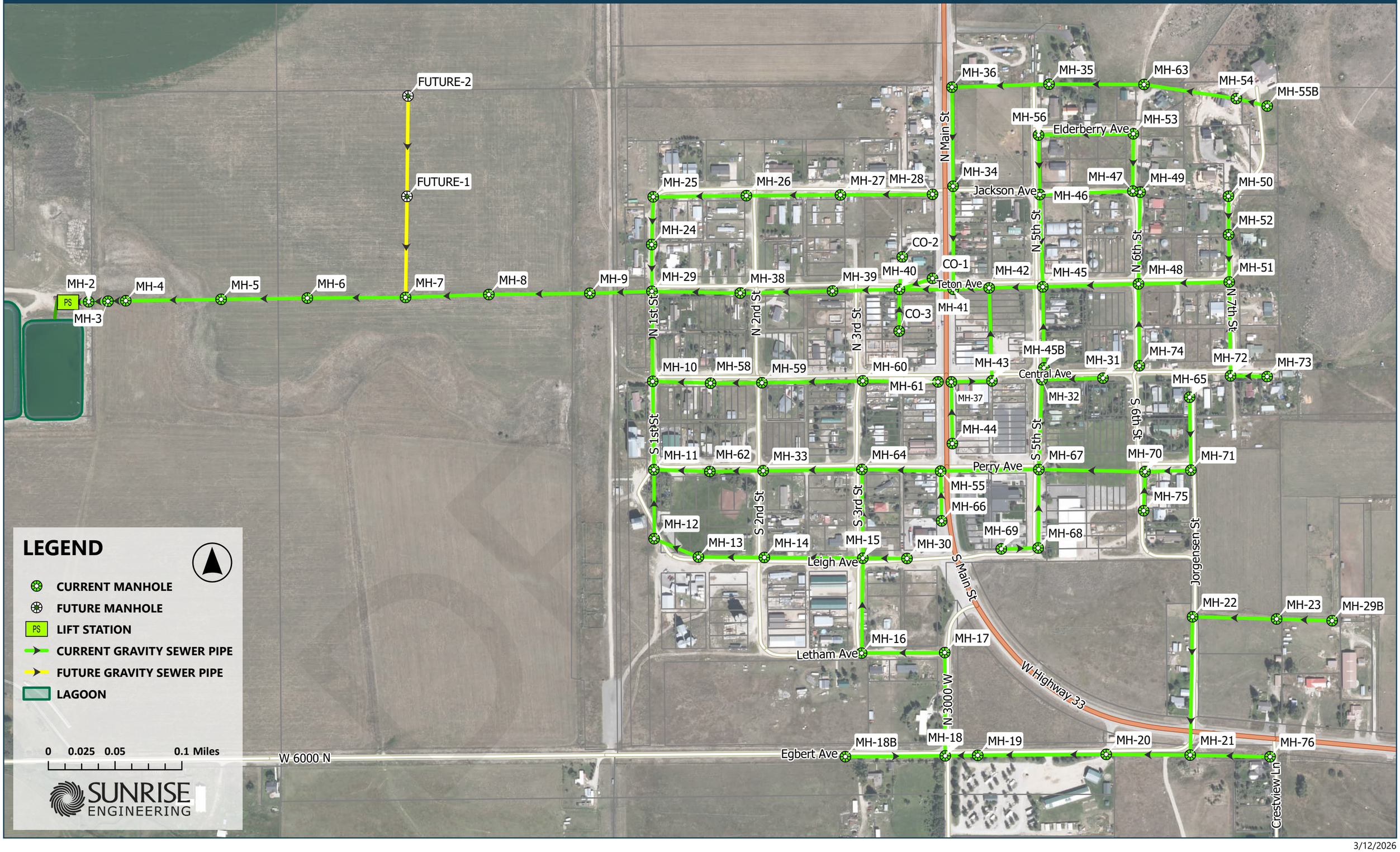
0 0.025 0.05 0.1 Miles

SUNRISE ENGINEERING

3/12/2026

CITY OF TETONIA | MANHOLE AND PIPE FLOW DIRECTION OVERVIEW

EXHIBIT ##



LEGEND

- CURRENT MANHOLE
- FUTURE MANHOLE
- PS LIFT STATION
- CURRENT GRAVITY SEWER PIPE
- FUTURE GRAVITY SEWER PIPE
- LAGOON

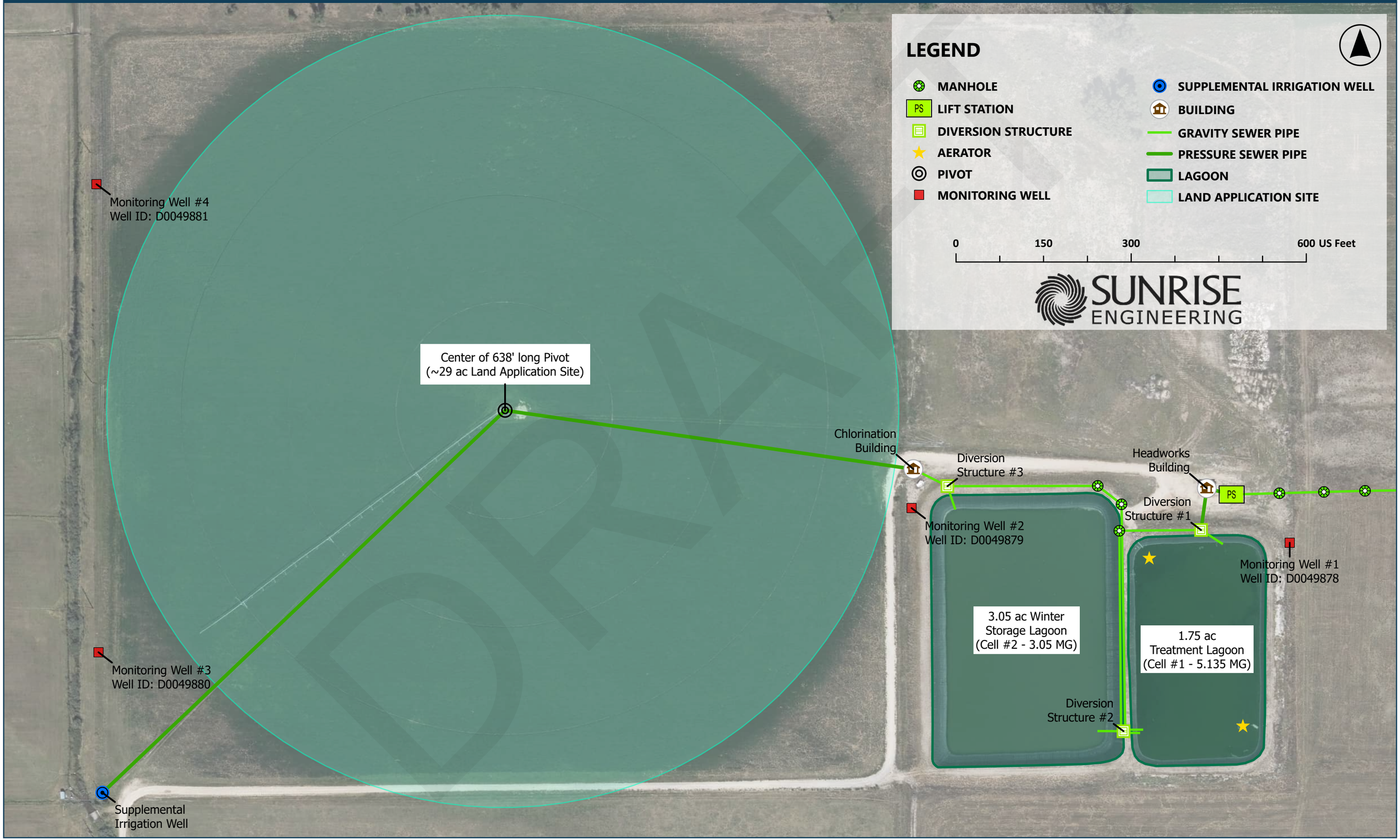
0 0.025 0.05 0.1 Miles

SUNRISE ENGINEERING

3/12/2026

CITY OF TETONIA | EXISTING WASTEWATER TREATMENT SYSTEM OVERVIEW

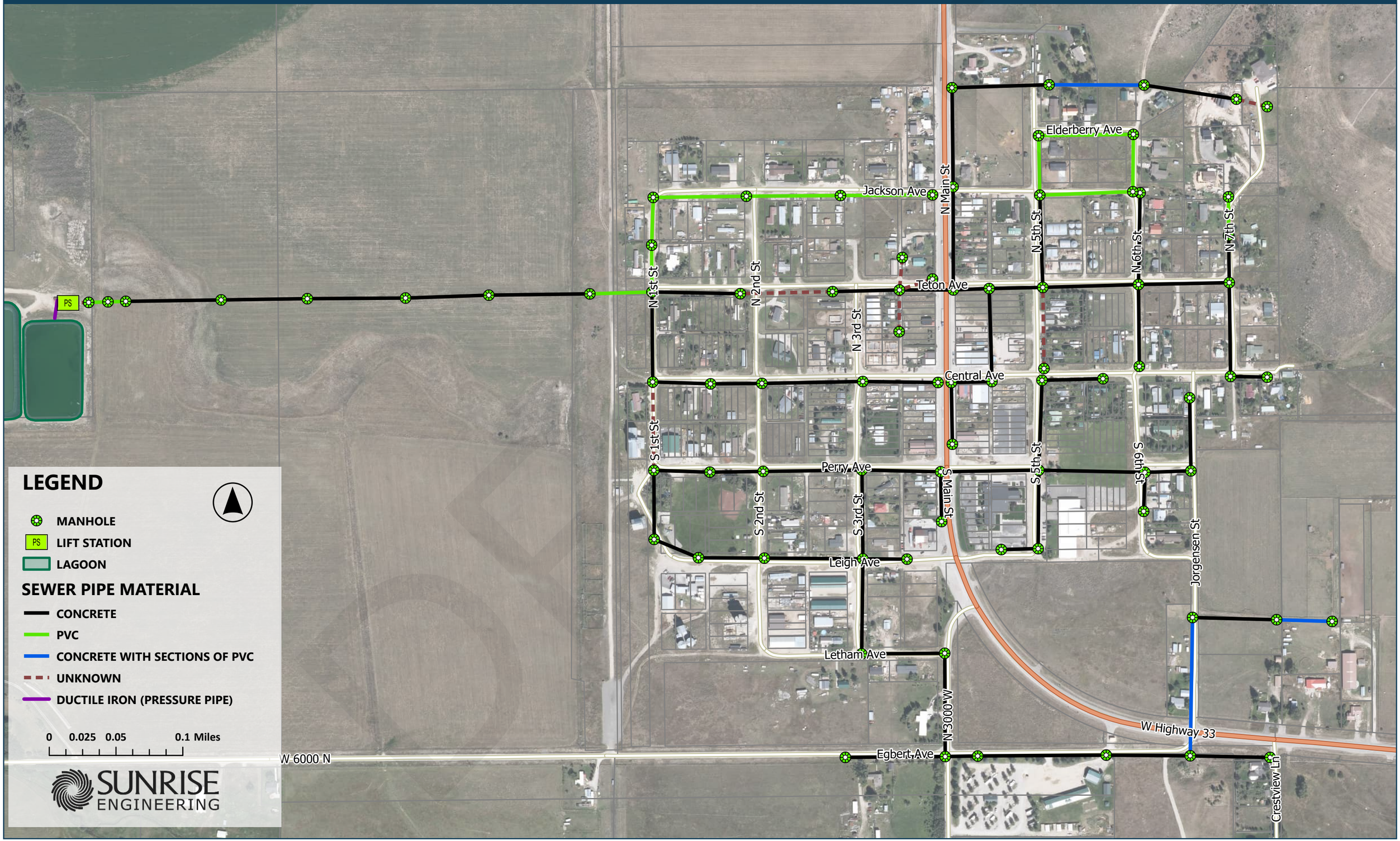
EXHIBIT ##



3/12/2026

CITY OF TETONIA | PIPE MATERIAL OVERVIEW

EXHIBIT ##



LEGEND

- MANHOLE
- PS LIFT STATION
- LAGOON

SEWER PIPE MATERIAL

- CONCRETE
- PVC
- CONCRETE WITH SECTIONS OF PVC
- UNKNOWN
- DUCTILE IRON (PRESSURE PIPE)

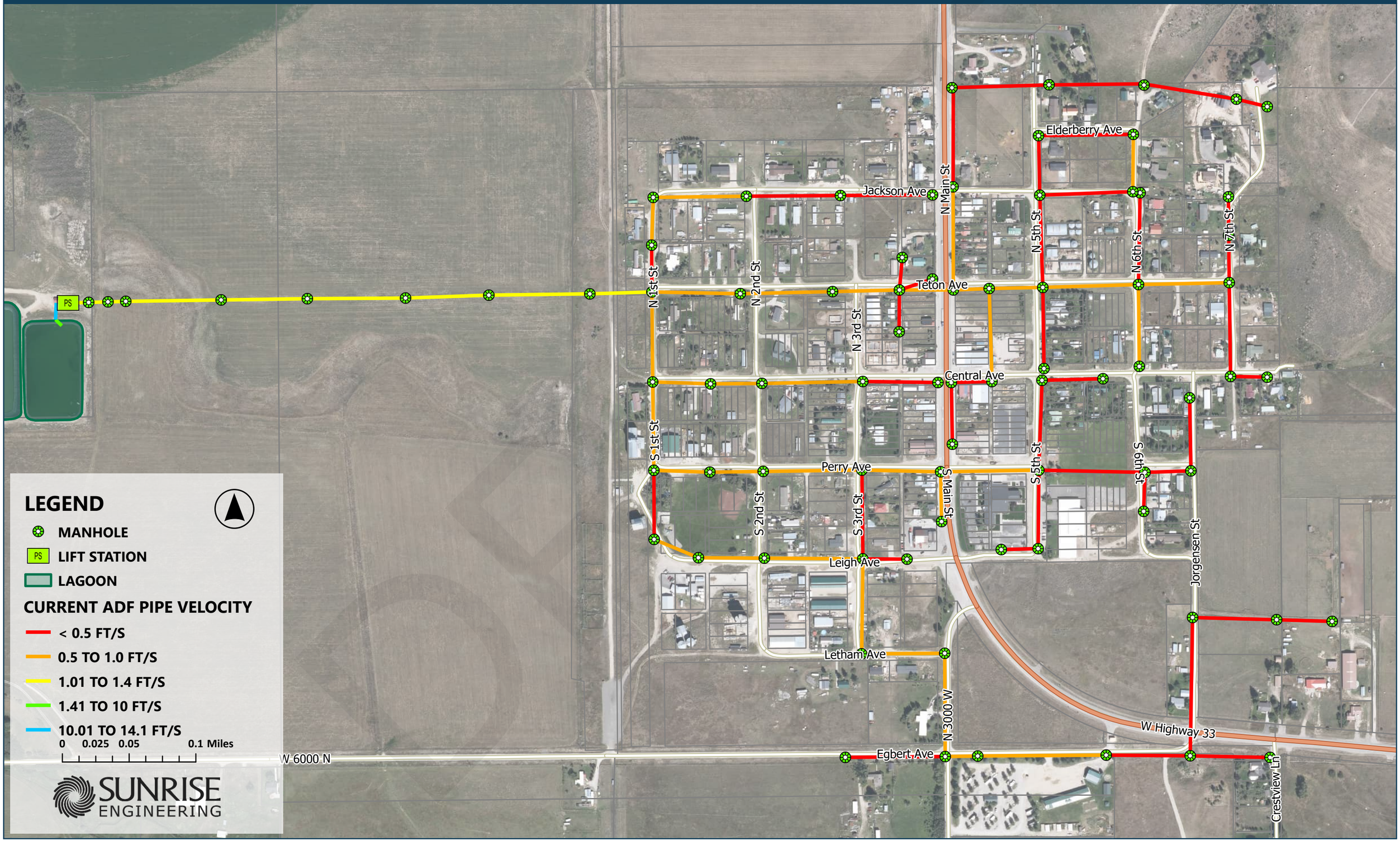
0 0.025 0.05 0.1 Miles

SUNRISE ENGINEERING

3/12/2026

CITY OF TETONIA | MODEL RESULTS FOR CURRENT (2025) ADF - PIPE VELOCITY

EXHIBIT ##



LEGEND

- MANHOLE
- PS LIFT STATION
- LAGOON

CURRENT ADF PIPE VELOCITY

- < 0.5 FT/S
- 0.5 TO 1.0 FT/S
- 1.01 TO 1.4 FT/S
- 1.41 TO 10 FT/S
- 10.01 TO 14.1 FT/S

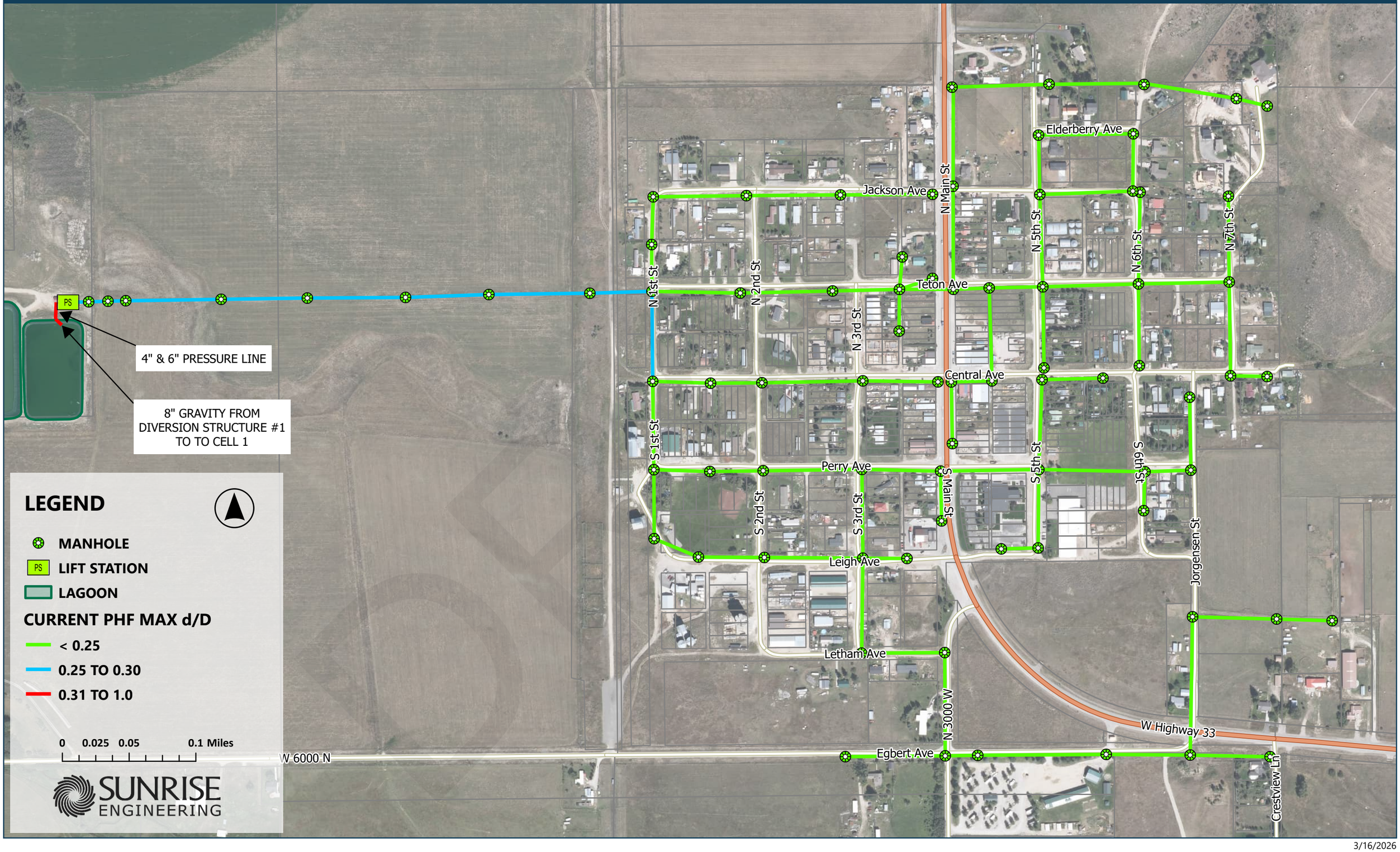
0 0.025 0.05 0.1 Miles

SUNRISE ENGINEERING

3/16/2026

CITY OF TETONIA | MODEL RESULTS FOR CURRENT (2025) PHF - MAXIMUM d/D

EXHIBIT ##



LEGEND

- MANHOLE
- PS LIFT STATION
- LAGOON

CURRENT PHF MAX d/D

- < 0.25
- 0.25 TO 0.30
- 0.31 TO 1.0

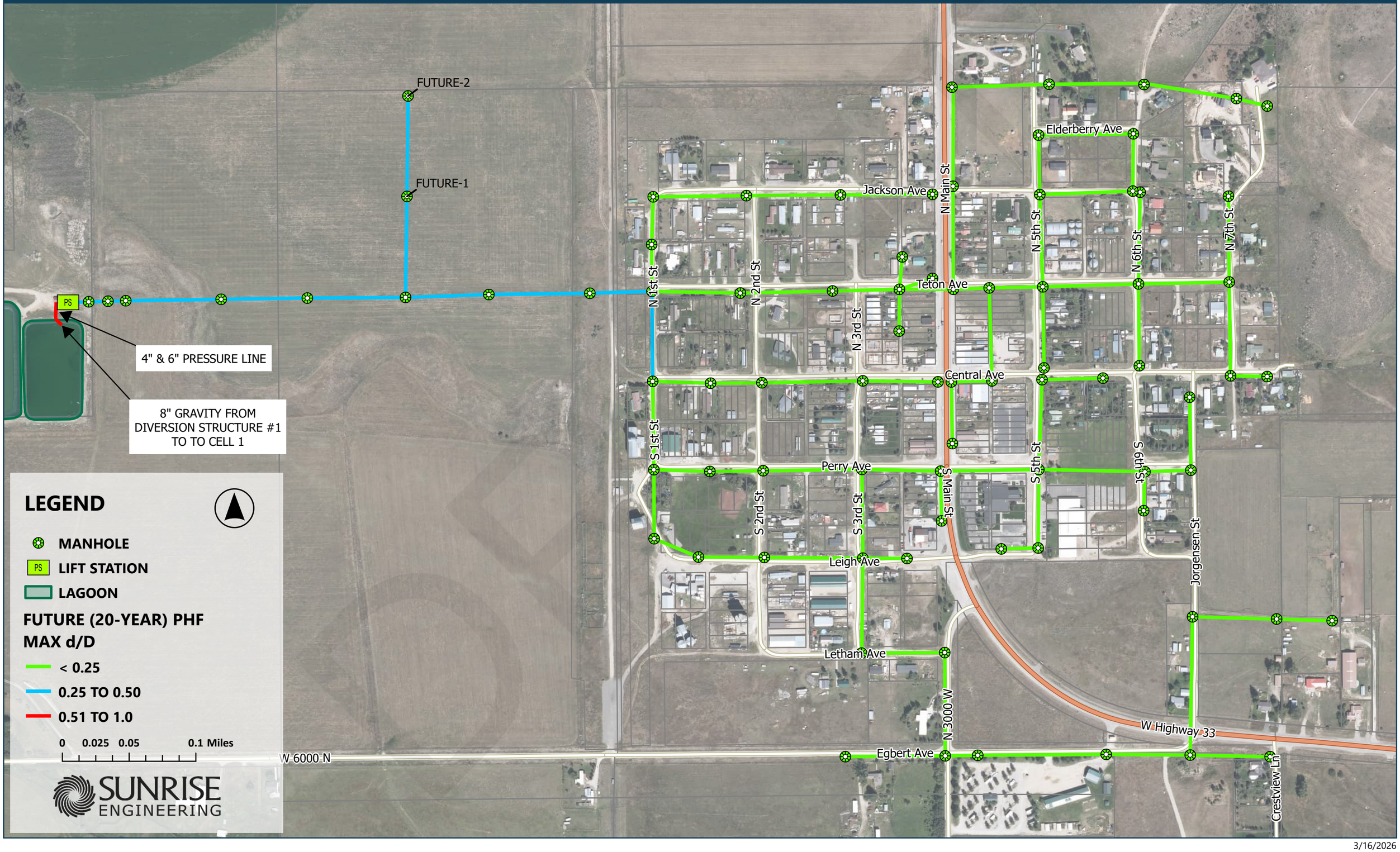
0 0.025 0.05 0.1 Miles

SUNRISE ENGINEERING

3/16/2026

CITY OF TETONIA | MODEL RESULTS FOR FUTURE (2045) PHF - MAXIMUM d/D

EXHIBIT ##



LEGEND

- MANHOLE
- PS LIFT STATION
- LAGOON

FUTURE (20-YEAR) PHF MAX d/D

- < 0.25
- 0.25 TO 0.50
- 0.51 TO 1.0

0 0.025 0.05 0.1 Miles

SUNRISE ENGINEERING

3/16/2026

CITY OF TETONIA | MODEL RESULTS FOR FUTURE (2065) PHF - MAXIMUM d/D

EXHIBIT ##

FUTURE-2

FUTURE-1

PS

4" & 6" PRESSURE LINE

8" GRAVITY FROM DIVERSION STRUCTURE #1 TO TO CELL 1

Elderberry Ave

Jackson Ave

N Main St

N 1st St

N 2nd St

N 3rd St

N 5th St

N 6th St

N 7th St

Teton Ave

Central Ave

S 1st St

S 2nd St

S 3rd St

S Main St

S 5th St

S 6th St

Perry Ave

Leigh Ave

Jorgensen St

Letham Ave

N 3000 W

W Highway 33

Egbert Ave

W 6000 N

Crestview Ln

LEGEND

- MANHOLE
- PS LIFT STATION
- LAGOON

FUTURE (40-YEAR) PHF MAX D/D

- < 0.25
- 0.25 TO 0.5
- 0.51 TO 0.70
- 0.71 TO 1

0 0.025 0.05 0.1 Miles

SUNRISE ENGINEERING

3/16/2026

Appendix A – Calculations

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Alternative	Upstream MH	Downstream MH	Material	Length	Reason for Maintenance
Moderate Pipe Segments (Rating 3)					
4B.15	MH-18B	Mh-18	Concrete	243	Roots in joint
4B.16	MH-23	MH-22	Concrete	364	Sagging & Joint Deflection
4B.17	MH-16	MH-15	Concrete	357	Roots in joint
4B.18	MH-15	MH-64	Concrete	341	A lot of sediment or grease built up near mh-15; roots in joints
4B.19	MH-15	MH-14	Concrete	385	Infiltration at last service upstream of mh-14
4B.20	MH-75	MH-70	Concrete	153	Lots built up near mh-75
4B.21	MH-68	MH-67	Concrete	346	Cracking & Corrosion
4B.22	MH-70	MH-67	Concrete	390	Some corrosion at joints
4B.23	MH-32	MH-67	Concrete	355	Sediments and rocks built up in mh-32
4B.24	MH-67	MH-55	Concrete	395	Some corrosion at joint
4B.25	MH-64	MH-33	Concrete	387	Some corrosion at joint
4B.26	MH-55	MH-64	Concrete	302	Appears to have corrosion around service and it sticks out
4B.27	MH-33	MH-62	Concrete	206	Debris at mh-33
4B.28	MH-60	MH-59	Concrete	226.9	Sagging Pipe
4B.29	MH-59	MH-58	Concrete	227	Sagging
4B.30	MH-73	MH-72	Concrete	137	Corrosion
4B.31	MH-51	MH-48	Concrete	320	Roots in joints; some corrosion around service

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Alternative	Upstream MH	Downstream MH	Material	Length	Reason for Maintenance
4B.32	MH-53	MH-56	PVC	332	Rocks near in pipe at mh-53, roots in tap (before pre-cleaning)
4B.33	MH-42	MH-41	Concrete	131	Cracking
4B.34	MH-35	MH-36	Concrete	396	Joint obstruction; joint separation; roots in joint
4B.35	MH-8	MH-7	Concrete	330	Corrosion
4B.36	MH-6	MH-5	Concrete	341	Corrosion
4B.37	MH-5	MH-4	Concrete	377	Corrosion

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SUNRISE ENGINEERING

EVALUATION OF SEWER MAINS

Project: City of Tetonia WWFPS
Project Number: 16084
Last Revised on: 2/24/2026
Created By: Laura Radke, PE

RATING	STATUS	ACTION
5	MOST SEVERE	NEEDS IMMEDIATE REPAIR
4	SEVERE	REPAIR
3	MODERATE	PLAN FOR FUTURE MAINTENANCE
2	MINOR	MONTIOR
< 2	MINIMAL	NO ACTION

PIPE SECTION	UPSTREAM MH	DOWNSTREAM MH	MATERIAL	SLOPE	LENGTH (FT)	SIZE (IN)	STRUCTURAL CRITERIA								MAX SCORE (Structural)	OPERATIONAL CRITERIA			MAX SCORE (Operational)	COMMENTS
							CRACKING	DEFORMATION	SAGGING	JOINT DEFECTS	CORROSION	CONDITION OF SERVICE	I&I	ROOTS		DEBRIS/ SEDIMENT	GREASE/ FOG	OBSTRUCTIONS		
1	MH-18B	MH-18	CONCRETE		242.5	8			3		3			3	3				0	ROOTS IN JOINTS
2	MH-29B	MH-23	CONCRETE/PVC		232.4	8	2		2		2				2	2	2		2	
3	MH-23	MH-22	CONCRETE		363.5	8			3	3					3	2			2	
4	MH-22	MH-21	CONCRETE/PVC		192.4	8			3		2		2	5	5	3		4	4	INFILTRATION AT JOINT, BAD ROOTS - COULDN'T COMPLETE CAMERA
5	MH-21	MH-20	CONCRETE		342.1	8			2		2				2	2			2	
6	MH-20	MH-19	CONCRETE		323.6	8			2		2				2	2			2	
7	MH-76	MH-21	CONCRETE		246.1	8				4			4		4	2			2	LOTS OF INFILTRATION IN JOINT CLOSEST TO MH-21; BEAVER SLIDE AT MH-21
8	MH19	MH-18	CONCRETE		137.5	8									0	2			2	BEAVER SLIDE AT MH-18
9	MH-18	MH-17	CONCRETE		387	8				3				4	4				0	ROOTS IN JOINTS
10	MH-17	MH-16	CONCRETE		291.2	8			2						2				0	
11	MH-16	MH-15	CONCRETE		356.9	8			2					3	3	2			2	ROOTS IN JOINT
12	MH-30	MH-15	CONCRETE		166.7	8									0		3		3	SEDIMENT OR GREASE BUILT UP NEAR MH-30
13	MH-15	MH-64	CONCRETE		341.2	8			2	3				3	3	3	3		3	A LOT OF SEDIMENT OR GREASE BUILT UP NEAR MH-15; ROOTS IN JOINTS
14	MH-15	MH-14	CONCRETE		385.2	8			2		2	3	3		3				0	INFILTRATION AT LAST SERVICE UPSTREAM OF MH-14
15	MH-14	MH-13	CONCRETE		389.5	8			2						2	2			2	
16	MH-12	MH-11	CONCRETE		218.4	8			4	3	3			2	4				0	CORROSION AT JOINT
17	MH-13	MH-12	CONCRETE		113.9	8			4						4				0	
18	MH-69	MH-68	CONCRETE		138.3	8									0				0	
19	MH-65	MH-71	CONCRETE		293.9	8		5		3		5			5	3	5	4	5	LARGE HOLE (BUT IT LOOKS LIKE THERE IS WHITE PVC PIPE OR SO BEHIND IT); LOTS OF GREASE AND ROCKS BUILT UP NEAR MH-65
20	MH-75	MH-70	CONCRETE		152.9	8					3				3	3	3		3	LOTS BUILT UP NEAR MH-75
21	MH-71	MH-70	CONCRETE		184.2	8									0	4			4	LOTS BUILT UP NEAR MH-70
22	MH-68	MH-67	CONCRETE		345.9	8	3				3				3	2	2		2	
23	MH-70	MH-67	CONCRETE		390	8	2			2	3				3	2			2	SOME CORROSION AT JOINTS
24	MH-32	MH-67	CONCRETE		354.8	8		2		3					3	2			2	SEDIMENTS AND ROCKS BUILT UP IN MH-32
25	MH-31	MH-32	CONCRETE		190.4	8			2						2	2			2	LOTS BUILT UP NEAR MH-31
26	MH-66	MH-55	CONCRETE		194	8			2						2	4	3		4	
27	MH-67	MH-55	CONCRETE		395.3	8	2			3	3				3	3	2		3	SOME CORROSION AT JOINT
28	MH-64	MH-33	CONCRETE		386.7	8			2	3	3				3	2			2	SOME CORROSION AT JOINT
29	MH-55	MH-64	CONCRETE		302.4	8				3		3			3	2			2	APPEARS TO HAVE CORROSION AROUND SERVICE AND IT STICKS OUT
30	MH-62	MH-11	CONCRETE		196.5	8									0		3		3	
31	MH-33	MH-62	CONCRETE		205.7	8	3		2						3	2			2	DEBRIS AT MH-33
32	MH-44	MH-37	CONCRETE		239.7	8	4	2		3	3				4	4	2		4	SOME JOINT SEPARATION, NOT MUCH FLOW (STANDING WATER/TP)
33	MH-37	MH-43	CONCRETE		143.4	8			2	2					2	2			2	
34	MH-60	MH-59	CONCRETE		389.7	8				3	3				3	3	2		3	JOINT SEPARATION
35	MH-61	MH-60	CONCRETE		217.6	8					2				2	3			3	LOTS OF DEBRIS BUILT UP AT MH-61
36	MH-59	MH-58	CONCRETE		226.9	8		2	3						3	2			2	

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SUNRISE ENGINEERING

EVALUATION OF SEWER MAINS

Project: City of Tetonia WWFPS
Project Number: 16084
Last Revised on: 2/24/2026
Created By: Laura Radke, PE

RATING	STATUS	ACTION
5	MOST SEVERE	NEEDS IMMEDIATE REPAIR
4	SEVERE	REPAIR
3	MODERATE	PLAN FOR FUTURE MAINTENANCE
2	MINOR	MONTIOR
< 2	MINIMAL	NO ACTION

PIPE SECTION	UPSTREAM MH	DOWNSTREAM MH	MATERIAL	SLOPE	LENGTH (FT)	SIZE (IN)	STRUCTURAL CRITERIA								MAX SCORE (Structural)	OPERATIONAL CRITERIA			MAX SCORE (Operational)	COMMENTS
							CRACKING	DEFORMATION	SAGGING	JOINT DEFECTS	CORROSION	CONDITION OF SERVICE	I&I	ROOTS		DEBRIS/ SEDIMENT	GREASE/ FOG	OBSTRUCTIONS		
37	MH-58	MH-10	CONCRETE		228.9	8		2	3			3		4	4	3			3	LARGE ROOT GROWING OUT OF RIM OF SERVICE; SAGGING/BUILT UP NEAR MH-10
38	MH-73	MH-72	CONCRETE		136.5	8					3				3	3			3	
39	MH-72	MH-51	CONCRETE		357.8	8	2		2						2	2			2	BUILD UP CAUSING BACKUP IN SECTION
40	MH-52	MH-51	CONCRETE		185.6	8			2	2					2	3			3	
41	MH-50	MH-52	PVC		149.3	8			2						2	1			1	THIS WAS POST-JETTING
42	MH-51	MH-48	CONCRETE		319.7	8				3	2			3	3	2			2	ROOTS IN JOINTS; SOME CORROSION AROUND SERVICE
43	MH-49	MH-48	CONCRETE		365.3	8				2	2				2	3	2		3	SOME CORROSION IN JOINT
44	MH-53	MH-47	PVC		78.4	8		2	4						4	2			2	ABANDONED DUE TO DEBRIS IN PIPE, SAGGING (15% OF VERTICAL DIMESNION)
45	MH-53	MH-56	PVC		331.6	8			3			3			3	3			3	ROCKS NEAR IN PIPE AT MH-53, ROOTS IN TAP (BEFORE PRE-CLEANING)
46	MH-74	MH-48	CONCRETE		311.2	8				2					2				0	
47	MH-47	MH-46	PVC		348.1	8									0	2			2	BUILD UP NEAR MH-47
48	MH-56	MH-46	PVC		233.1	8									0	2			2	
49	MH-46	MH-45	CONCRETE		242.2	8			2	2	2				2			4	4	SEALING RING CROSSES AT JOINT
50	MH-48	MH-45	CONCRETE		383.3	8				2					2	2			2	INTRUDING SEALING GROUT
51	MH-43	MH-42	CONCRETE		363.5	8	2	2	2	2					2	3		3	3	A LOT OF TP BUILT UP CAUSING BACKUP; SEALING GROUT IN JOINT
52	MH-45	MH-42	CONCRETE		209.5	8			2						2				0	
53	MH-42	MH-41	CONCRETE		130.6	8	3								3				0	
54	MH-54	MH-63	CONCRETE		327.3	8	2		2		2				2				0	DEBRIS/SEDIMENT NEAR MH-63 SEEN BEFORE PRE-CLEANING
55	MH-63	MH-35	CONCRETE/PVC		255.7	8	2			2				4	4	2			2	ROOTS NEAR MH-35, ROOTS IN SEVERAL JOINTS (5% PIPE LOST)
56	MH-35	MH-36	CONCRETE		396.1	8				3				3	3				0	JOINT OBSTRUCTION; JOINT SEPARATION; ROOTS IN JOINT
57	MH-36	MH-34	CONCRETE		353.9	8					2				2		3		3	A LOT OD DEBRIS IN JOINTS
58	MH-34	MH-41	CONCRETE		161	8			2	3				5	5	3	2	5	5	LARGE OBSTRUCTION - ROOTS IN JOINT
59	MH-41	MH-40	CONCRETE		204.8	8									0	3			3	
60	MH-28	MH-27	PVC	0.36%	357.1	8			2						2	3			3	APPEARS TO HAVE ROCKS IN BOTTOM OF PIPE
61	MH-27	MH-26	PVC	0.55%	370.6	8									0	3	2		3	
62	MH-26	MH-25	PVC	0.32%	366.3	8									0				0	
63	MH-25	MH-24	PVC	0.36%	185	8			2						2				0	
64	MH-38	MH-29	CONCRETE		22.6	8			4						4			4	4	CAMERA COULDN'T GET THROUGH
65	MH-40	MH-39	CONCRETE		358.7	8			2						2				0	
66	MH-29	MH-9	PVC		245.2	8									0				0	
67	MH-9	MH-8	CONCRETE		447.6	8			2						2	3			3	PIPE LONGER THAN 400 FT
68	MH-8	MH-7	CONCRETE		329.5	8			2		3				3	3			3	
69	MH-7	MH-6	CONCRETE		387.4	8			2						2				0	
70	MH-6	MH-5	CONCRETE		340.5	8			2		3				3				0	
71	MH-5	MH-4	CONCRETE		377.1	8			2		3				3				0	
72	MH-4	MH-3	PVC			8									0	3	5	4	5	OBSTRUCTION - COULDN'T COMPLETE CAMERA TEST
73	MH-10	MH-29	CONCRETE		364.7	8			2						2	3			3	
74	MH-24	MH-29	PVC	0.36%	184.7	8									0				0	
75	MH-3	MH-2	PVC		76.1	8									0		4		4	

SOURCE: 2024 CCTV CAMERA VIDEOS AND REPORT

TOTAL # OF SECTIONS CAMERA'D = 86

TOTAL LENGTH OF PIPE = 22,795 FT
= 4.32 MILES

General Recommendations:

- Implement a flushng schedule to clear out buildup (due to shallow slopes)
- Lift the Manhole Rims to prevent rocks from getting into manholes and pipes

Material	Size	Length		% of Total System
Concrete	8"	16,559	FT	81.7%
PVC	8"	2,926	FT	14.4%
Concrete/PVC	8"	681	FT	3.4%
DI Pressure Pipe	4"	40	FT	0.2%
DI Pressure Pipe	6"	65	FT	0.3%
	Total	**20,270**	**FT**	**100.0%**

Pipe Condition Summary				
Max Rating	Number of Pipes	Length (ft)	Number of Pipes	Length (ft)
	Structural		Operational	
<=3	63	17,727	65	18,559
>3	12	2,438	10	1,606

DRAFT

SUNRISE ENGINEERING

ERU Determination

Project: City of Tetonia WFPS Amendment
Project Number: 17101
Last Revised on: 5/11/2026
Created By: Laura Radke, PE

				Data Based on Sewer Fee Schedule*			
Name	Type of User	Service Address	Water Meter Size	Classification	EDUs from Sewer Fee Table	Count	Calculated # of ERUs
Tetonia Grinders	Commercial	2869 W Hwy 33	1	Café, Drive-In	2	1	2
City of Tetonia	Commercial	3192 Perry Ave	0.75	Office	1	1	1
Little Teton Gem LLC	Commercial	6490 N Main	0.75	Office	1	1	1
Teton Peaks Resort	Commercial	2901 Egbert Ave	2	See Note 1	16	1	16
Teton Peaks Resort RV	Commercial	2969 Egbert Ave	2	See Note 2	10.25	1	10.25
Majestic Mountain Iron	Commercial	6101 South 2nd Street	0.75	Garage/Maintenance Shop	1	1	1
Tetonia City Ball Park	Commercial	Perry Ave (2670)	0.75	No Sewer	0	0	0
Berry Oil	Industrial	3193 Leigh Ave	0.75	Garage/Maintenance Shop	1	1	1
Tetonia City Park Restrooms	Commercial	Perry Ave (2675)	0.75	Public Restrooms, per toilet, urinal	0.125	4	0.5
Hibbert Rentals	Commercial	6318 N 3rd Street	0.75	Single Dwelling Unit	1	1	1
Right Angle Group LLC	Commercial	3059 Teton Ave	1	Garage/Maintenance Shop	1	1	1
Legacy 11	Commercial	6270 S 3rd St	0.75	Single Dwelling Unit	1	4	4
Action Excavation	Commercial	6256 S 3rd St	0.75	Garage/Maintenance Shop	1	1	1
City of Tetonia Pocket Park	Commercial	Highway 33	0.75	No Sewer	0	0	0
Grand View General Store / JCB&Sons	Commercial	6170 S Main	0.75	Service Station/Grocery Store	2	1	2
Sun Shack/Tetonia Tire	Commercial	3031 Central Ave	0.75	See Note 3	1	1	1
Daves Pubb LLC	Commercial	6290 N Main Street	0.75	Bar or Tavern (Per seat/Total Cap.)	0.06	34	2.0
Silverstar	Commercial	6309 N Main	0.75	Office	1	1	1
GNBE Holdco LLC	Commercial	6299 N Main	2	Café, up to 50 seats	2	1	2
Historic Woodworks LLC	Commercial	6293 N Main	0.75	Garage/Maintenance Shop	1	1	1
US Post Office	Commercial	6229 S Main	0.75	Office	1	1	1
Church of JC of LDS	Commercial	209 S Main St	2	See Note 4	6	1	6
Teton School Dist 401	Commercial	215 S 5th St	1.5	School with cafeteria, per student & employee	0.05	88	4.4
Teton County Fire District	Commercial	3204 Perry Ave	2	Garage/Maintenance Shop	1	1	1
[name redacted]	Residential	3162 Teton Avenue	0.75	Single Dwelling Unit	1	1	1
	Residential	6435 N 5th Street	1	Single Dwelling Unit	1	1	1
	Residential	6458 N 7th Street	1	Single Dwelling Unit	1	1	1
	Residential	6468 N Main Unit B	1	Single Dwelling Unit	1	1	1
	Residential	6311 N 3rd Street Unit A	1	Single Dwelling Unit	1	1	1
	Residential	6311 N 3rd Street Unit B	1	Single Dwelling Unit	1	1	1
	Residential	3038 Central Avenue B	1	Single Dwelling Unit	1	1	1
	Residential	3038 Central Avenue A	1	Single Dwelling Unit	1	1	1
	Residential	3040 Central Avenue B	1	Single Dwelling Unit	1	1	1
	Residential	3040 Central Avenue A	1	Single Dwelling Unit	1	1	1
	Residential	3060 Central Avenue A	1	Single Dwelling Unit	1	1	1
	Residential	3060 Central Avenue Unit B	1	Single Dwelling Unit	1	1	1
	Residential	2959 Jackson Avenue	1	Single Dwelling Unit	1	1	1
	Residential	6276 S 1st St	0.75	Single Dwelling Unit	1	1	1
	Residential	6304 N 1st Street	1	Single Dwelling Unit	1	1	1
	Residential	3185 Central Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3170 Perry Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3173 Central Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	6232 S 2nd Street	0.75	Single Dwelling Unit	1	1	1
	Residential	3122 Central Ave	1	Single Dwelling Unit	1	1	1
	Residential	3176 Central Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	6321 N 1st St	0.75	Single Dwelling Unit	1	1	1
	Residential	6393 N 1st	0.75	Single Dwelling Unit	1	1	1
	Residential	6366 N 1st St	0.75	Single Dwelling Unit	1	1	1
	Residential	6406 N 1st St	0.75	Single Dwelling Unit	1	1	1
	Residential	3191 Jackson Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3196 Jackson Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3170 Jackson Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6408 N 2nd Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6390 N 2nd Street	0.75	Single Dwelling Unit	1	1	1

ERU Determination

Project: City of Tetonia WFPS Amendment
Project Number: 17101
Last Revised on: 5/11/2026
Created By: Laura Radke, PE

				Data Based on Sewer Fee Schedule*			
Name	Type of User	Service Address	Water Meter Size	Classification	EDUs from Sewer Fee Table	Count	Calculated # of ERUs
[name redacted]	Residential	3126 Jackson Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3095 Jackson Avenue	0.75	Single Dwelling Unit	1	1	1
	Residential	3127 Jackson Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3121 Jackson Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3111 Jackson Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3079 Jackson Avenue	0.75	Single Dwelling Unit	1	1	1
	Residential	3080 Jackson Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3050 Jackson Avenue	0.75	Single Dwelling Unit	1	1	1
	Residential	6440 N Main	0.75	Single Dwelling Unit	1	1	1
	Residential	6464 N Main- ADU	0.75	Single Dwelling Unit	1	1	1
	Residential	6470 Main St	0.75	Single Dwelling Unit	1	1	1
	Residential	6515 N Main	0.75	Single Dwelling Unit	1	1	1
	Residential	6445 N Main Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6401 N main	0.75	Single Dwelling Unit	1	1	1
	Residential	6385 N Main	0.75	Single Dwelling Unit	1	1	1
	Residential	6377 North Main Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6361 N Main	0.75	Single Dwelling Unit	1	1	1
	Residential	6327 N 5th St	1	Single Dwelling Unit	1	1	1
	Residential	6360 N 5th Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6382 N 5th St	0.75	Single Dwelling Unit	1	1	1
	Residential	6402 N 5th Street	0.75	Single Dwelling Unit	1	1	1
	Residential	2917 Elderberry Avenue	0.75	Single Dwelling Unit	1	1	1
	Residential	6475 N 5th St	0.75	Single Dwelling Unit	1	1	1
	Residential	2906 Elderberry Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	2894 Elderberry Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	6511 N Main	0.75	Single Dwelling Unit	1	1	1
	Residential	2850 Eldererry Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	6445 N 6th Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6239 E Jorgenson	0.75	Single Dwelling Unit	1	1	1
	Residential	6405 N 6th St	0.75	Single Dwelling Unit	1	1	1
	Residential	6398 N 6th Street	0.75	Single Dwelling Unit	1	1	1
	Residential	2834 Teton Ave (2360)	0.75	Single Dwelling Unit	1	1	1
	Residential	6375 N 7th St	0.75	Single Dwelling Unit	1	1	1
	Residential	6372 N 7th Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6400 N 7th St	0.75	Single Dwelling Unit	1	1	1
	Residential	6416 N 7th Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6428 N 7th Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6491 N 7th Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6428 N 7th -B Street	0.75	Single Dwelling Unit	1	1	1
	Residential	2821 Teton Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	6324 7th Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6323 N 7th Street	0.75	Single Dwelling Unit	1	1	1
	Residential	2766 Central Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	2749 Central Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	2771 Central Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	6292 North 7th Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6261 Jorgensen St	0.75	Single Dwelling Unit	1	1	1
	Residential	6239 S 6th St	0.75	Single Dwelling Unit	1	1	1
	Residential	2833 Perry Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	6459 N 6th Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6177 S 6th St	0.75	Single Dwelling Unit	1	1	1
	Residential	6159 S 6th St	0.75	Single Dwelling Unit	1	1	1
	Residential	6034 Jorgensen Street	0.75	Single Dwelling Unit	1	1	1
	Residential	2756 W Hwy 33	0.75	Single Dwelling Unit	1	1	1

ERU Determination

Project: City of Tetonia WFPS Amendment
Project Number: 17101
Last Revised on: 5/11/2026
Created By: Laura Radke, PE

				Data Based on Sewer Fee Schedule*			
Name	Type of User	Service Address	Water Meter Size	Classification	EDUs from Sewer Fee Table	Count	Calculated # of ERUs
[name redacted]	Residential	2734 W Highway 33	1	Single Dwelling Unit	1	1	1
	Residential	2688 W HWY 33	0.75	Single Dwelling Unit	1	1	1
	Residential	5986 Crestview Ln	0.75	Single Dwelling Unit	1	1	1
	Residential	2801 Egbert Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3061 Egbert Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	6030 N 3000 W	0.75	Single Dwelling Unit	1	1	1
	Residential	3027 Letham Avenue	0.75	Single Dwelling Unit	1	1	1
	Residential	3051 Letham Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3084 Letham Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3083 Letham Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3102 Central Avenue	0.75	Single Dwelling Unit	1	1	1
	Residential	3080 Central Avenue	0.75	Single Dwelling Unit	1	1	1
	Residential	6330 N 3rd Street, Unit A	1	Single Dwelling Unit	1	1	1
	Residential	6330 N 3rd Street, Unit B	1	Single Dwelling Unit	1	1	1
	Residential	3115 Central Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3112 Perry Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	6248 S 3rd St	0.75	Single Dwelling Unit	1	1	1
	Residential	3103 Perry Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	6181 S 2nd St	0.75	Single Dwelling Unit	1	1	1
	Residential	6170 South 3rd Street	0.75	Single Dwelling Unit	1	1	1
	Residential	3098 Leigh Avenue	1	Single Dwelling Unit	1	1	1
	Residential	3114 Leigh Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3037 Leigh Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3044 Leigh Avenue	0.75	Single Dwelling Unit	1	1	1
	Residential	3044 Leigh Avenue	0.75	Single Dwelling Unit	1	1	1
	Residential	6208 S Main	0.75	Single Dwelling Unit	1	1	1
	Residential	6191 S 3rd St	0.75	Single Dwelling Unit	1	1	1
	Residential	6201 South 3rd Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6247 S 3rd St	0.75	Single Dwelling Unit	1	1	1
	Residential	6210 South 3rd Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6236 S. Main Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6258 S Main	0.75	Single Dwelling Unit	1	1	1
	Residential	6266 S Main	0.75	Single Dwelling Unit	1	1	1
	Residential	6263 S Main Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6247 S Main	0.75	Single Dwelling Unit	1	1	1
	Residential	6334 N Main	0.75	Single Dwelling Unit	1	1	1
	Residential	6384 North Main	0.75	Single Dwelling Unit	1	1	1
	Residential	2945 Central Ave (2320)	0.75	Single Dwelling Unit	1	1	1
	Residential	6247 S 5th St	0.75	Single Dwelling Unit	1	1	1
	Residential	6263 S 5th Street	0.75	Single Dwelling Unit	1	1	1
	Residential	6293 N 5th St	0.75	Single Dwelling Unit	1	1	1
	Residential	2880 Central Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	2871 Central Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	2864 Central Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	2840 Central Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	2828 Central Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	6266 Jorgensen St	0.75	Single Dwelling Unit	1	1	1
	Residential	6257 S 6th St	0.75	Single Dwelling Unit	1	1	1
	Residential	3035 Teton Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3066 Teton Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	6350 N 3rd	0.75	Single Dwelling Unit	1	1	1
	Residential	3124 Teton Avenue Tetonia 83452	0.75	Single Dwelling Unit	1	1	1
	Residential	6339 N 2nd St	0.75	Single Dwelling Unit	1	1	1

ERU Determination

Project: City of Tetonia WFPS Amendment
Project Number: 17101
Last Revised on: 5/11/2026
Created By: Laura Radke, PE

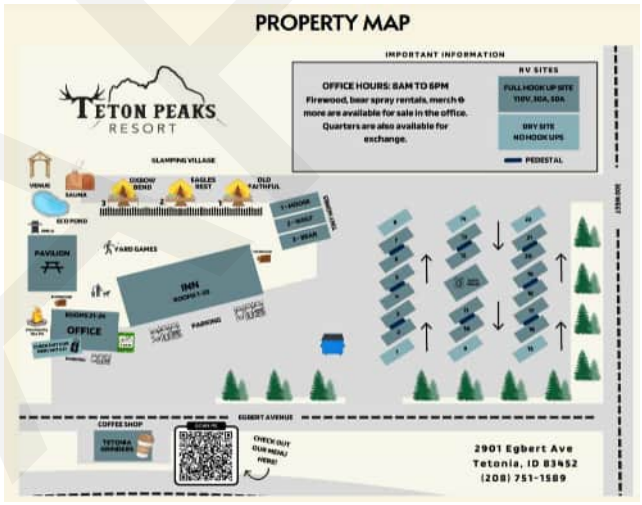
				Data Based on Sewer Fee Schedule*			
Name	Type of User	Service Address	Water Meter Size	Classification	EDUs from Sewer Fee Table	Count	Calculated # of ERUs
[name redacted]	Residential	3159 Teton Ave	0.75	Single Dwelling Unit	1	1	1
	Residential	3172 Teton Avenue	0.75	Single Dwelling Unit	1	1	1
	Residential	3152 Teton Avenue	0.75	Single Dwelling Unit	1	1	1
*Number of EDUs are based on City of **Tetonia Resolution No 2024-03** Section 2 - Sewer Fee Tables.					Total # of ERUs =		201.2

# of Residential Connections =	140
# of Commercial Connections =	23
Total =	163

# of Residential ERUs =	140
# of Commercial ERUs =	61
Total =	201

Note 1:
Teton Peaks Resort* consists of:

	EDUs	Count	Total EDUs
Office Building:			
Office	1	1	1
Hotels & Motels (Per unit with showers)	0.5	4	2
Inn:			
Hotels & Motels (Per unit with showers)	0.5	20	10
Tiny Homes:			
Single Dwelling Unit	1	3	3
*Assumptions based on Property Map		Total =	16



Note 2:
Teton Peaks Resort RV* consists of:

	EDUs	Count	Total EDUs
Bath House with Laundry:			
Laundromat, up to 10 washers (Seasonal EDUs)	2	1	2
Public Showers and Bathrooms (per avg person day) (Seasonal EDUs)**	0.25	6	1.5
RV Trailer Sites with Hookups:			
Trailer or RV Park per Overnight Trailers (with showers/bath) (Seasonal EDUs)	0.25	16	4
Trailer or RV Park per Overnight Trailers (no showers/bath) (Seasonal EDUs)	0.125	6	0.75
Dump Station:			
Trailer or RV Park per Dump Station (Seasonal EDUs)	2	1	2
*Assumptions based on Property Map		Total =	10.25

**Assume each Glamping Site (3) has 2 people who use the Bathroom facility

Note 3:
Sun Shack & Tetonia Tire consists of:

	EDUs	Count	Total EDUs
Sun Shack:			
Barber and Beauty Shop (per chair)	0.5	2	1
Tetonia Tire:			
Garage or Maintenance Shop*	1	0	0
*There is no bathroom or connection to the Garage -> Bathroom in the Barber Shop is used		Total =	1

Note 4:
The Church of JC of LDS* consists of:

	EDUs	Count	Total EDUs
Churches (single congreation)	2.5	1	2.5
Additional for each additional congregation	2.5	1	2.5
Additional for kitchen	1	1	1
*The church has 2 wards (congregations) and is equipped with a full kitchen		Total =	6

20-Year & 40-Year Population Projections

Project: City of Tetonia WWFPS
Project Number: 16084
Last Revised on: 11/3/2025
Created By: Laura Radke, PE

Proposed Population with 8.5% Annual % Growth for first 5 years and 3.0% after

Growth Rate next 5 years = 8.5%
Growth Rate after 2030 = 3.0%

	Year	Population	Annual % Growth
Historic	1970	176	-
	1980	191	0.8%
	1990	132	-3.6%
	2000	247	6.5%
	2010	269	0.9%
	2020	308	1.4%
20-Year Future	**2025**	**442**	**7.5%**
	2026	479	**8.5%**
	2027	520	8.5%
	2028	564	8.5%
	2029	612	8.5%
	2030	**664**	**8.5%**
	2031	684	3.0%
	2032	705	3.0%
	2033	726	3.0%
	2034	748	3.0%
	2035	**770**	**3.0%**
	2036	793	3.0%
	2037	817	3.0%
	2038	841	3.0%
	2039	867	3.0%
	2040	**893**	**3.0%**
	2041	919	3.0%
	2042	947	3.0%
	2043	975	3.0%
	2044	1005	3.0%
	2045	**1035**	**3.0%**
40-Year Future	2046	1066	3.0%
	2047	1098	3.0%
	2048	1131	3.0%
	2049	1165	3.0%
	2050	**1200**	**3.0%**
	2051	1236	3.0%
	2052	1273	3.0%
	2053	1311	3.0%
	2054	1350	3.0%
	2055	**1391**	**3.0%**
	2056	1432	3.0%
	2057	1475	3.0%
	2058	1520	3.0%
	2059	1565	3.0%
	2060	**1612**	**3.0%**
	2061	1661	3.0%
	2062	1710	3.0%
	2063	1762	3.0%
	2064	1815	3.0%
	2065	**1869**	**3.0%**

Estimated Existing Population

50-Year Avg =	1.1%
40-Year Avg =	1.2%
30-Year Avg =	2.9%
20-Year Avg =	1.1%
10-Year Avg =	1.4%

2020 - 2025 Building Permit and New Connections

Year	Building Permits	New Connections
2020	10	5
2021	8	2
2022	9	12
2023	12	5 (1 commercial)
2024	2	2
2025	5 (pending)	6 (pending)
Sum	**46**	**32**

Assumption:
1 Unit = 2.91 people (based on 2020 Census)

Estimated 2020 - 2025 Population

Year	# Building Permits	Estimated Population[1]	Annual % Growth
2020	0	308	- (Census)
2020	10	337	2.3% [2]
2021	8	360	6.9%
2022	9	386	7.3%
2023	12	421	9.0%
2024	2	427	1.4%
2025	5	442	3.4%
		2020 - 2024 AVG =	**8.5%**

[1]Population estimated based on assumption of 2.91 people per household based on 2020 Census.
[2]Based on 2020 Census Population + (10 new Building Permits * 2.91 people per household)

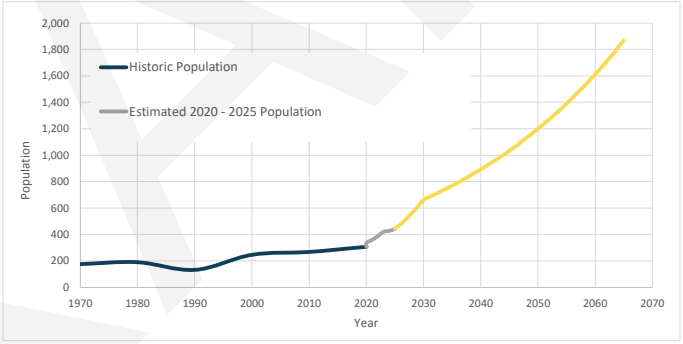
Percent Growth Calculation:

$$P_t = P_0(1+k)^n$$

where:
$P_t = population\ at\ time\ t$
$P_0 = population\ at\ time\ zero$
$k = growth\ rate$
$n = number\ of\ periods$

Solve for growth rate (k):

$$k = \left(\frac{P_t}{P_0}\right)^{\frac{1}{n}} - 1$$



Growth Rate next 5 years = 8.5%
Growth Rate after 2030 = 3.0%

ERU Projections

Year	Residential ERUs	Commercial ERUs	Total ERUs	New ERUs Since 2025
2025	140	61	201	-
2030	211	92	303	101
2035	244	107	351	150
2040	283	124	407	205
2045	328	143	471	270
2050	380	166	546	345
2055	441	193	633	432
2060	511	223	734	533
2065	592	259	851	650

Growth Rate next 5 years = 8.5%
Growth Rate after 2030 = 3.0%

Future Population

Year	Population	Residential Connection	Commercial Connections	Total Connections	New Connections
2026	479	165	49	214	-
2031	684	235	74	310	95
2036	793	273	86	359	145
2041	919	316	100	416	202
2046	1066	367	116	483	268

[1]Estimated based on 8.5% growth rate, assuming that there were 42 commercial connections in 2024 (based on Forsgren Population Projection Updates dated April 2025)

DRAFT

2022 & 2023 Raw WW Flow Data & Summaries

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	2/9/2026
Created By:	Laura Radke, PE

Color Ramp

- Low Flow
- Medium Flow
- High Flow

Source: 'City of Tetonia Water and Sewer Flow Rates Nov2023' spreadsheet (provided by City)

Date	WWTP Daily Flow (Gal)
9/9/2022	11,251
9/10/2022	20,031
9/11/2022	23,913
9/12/2022	20,247
9/13/2022	19,902
9/14/2022	20,267
9/15/2022	20,207
9/16/2022	19,648
9/17/2022	21,419
9/18/2022	23,209
9/19/2022	21,536
9/20/2022	20,472
9/21/2022	20,181
9/22/2022	23,940
9/23/2022	20,308
9/24/2022	21,004
9/25/2022	25,184
9/26/2022	25,176
9/27/2022	20,783
9/28/2022	20,290
9/29/2022	20,740
9/30/2022	19,950
10/1/2022	22,497
10/2/2022	24,754
10/3/2022	22,369
10/4/2022	21,174
10/5/2022	20,836
10/6/2022	22,875
10/7/2022	23,670

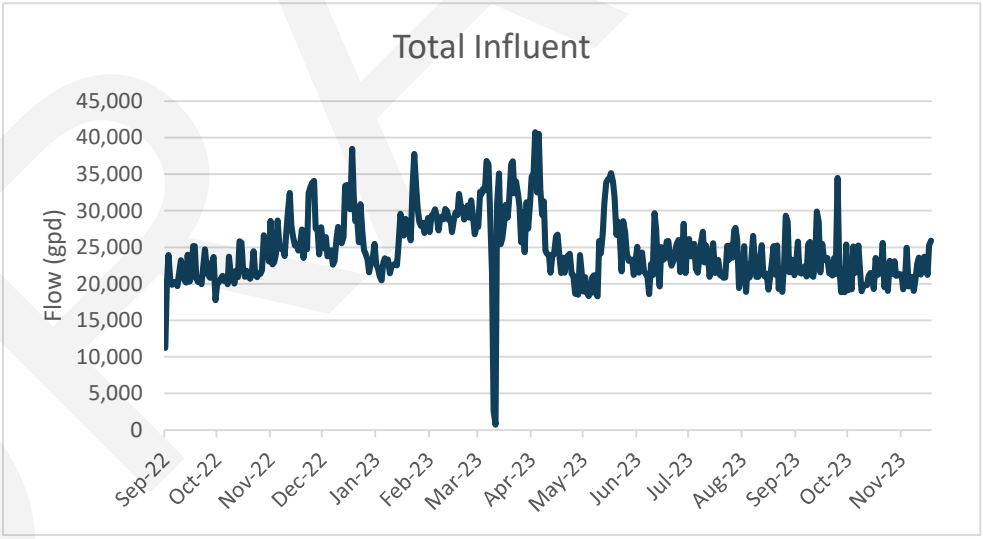
Annual Recorded Flow Data		
Year	2022	2023
Total Flow (MG)	2.8	8.2
# Days	113	329
ADD (gpd)	**24,527**	**24,856**
ADD (gpm)	**17.0**	**17.3**

Average Flows (gal/day)		
	2022	2023
Jan	-	24,935
Feb	-	29,204
Mar	-	28,915
Apr	-	28,102
May	-	24,442
Jun	-	23,522
Jul	-	23,665
Aug	-	22,699
Sep	20,894	23,401
Oct	21,711	21,804
Nov	25,223	21,883
Dec	28,459	-

DRAFT

Date	WWTP Daily Flow (Gal)
10/8/2022	17,770
10/9/2022	19,969
10/10/2022	20,250
10/11/2022	20,663
10/12/2022	21,078
10/13/2022	20,410
10/14/2022	20,719
10/15/2022	19,958
10/16/2022	23,712
10/17/2022	21,183
10/18/2022	21,138
10/19/2022	20,043
10/20/2022	21,779
10/21/2022	20,900
10/22/2022	25,835
10/23/2022	25,648
10/24/2022	22,085
10/25/2022	20,962
10/26/2022	21,779
10/27/2022	21,201
10/28/2022	20,715
10/29/2022	21,263
10/30/2022	24,463
10/31/2022	21,333
11/1/2022	20,905
11/2/2022	21,398
11/3/2022	21,367
11/4/2022	21,855
11/5/2022	26,620
11/6/2022	23,664
11/7/2022	26,058
11/8/2022	23,023
11/9/2022	28,632
11/10/2022	22,665
11/11/2022	22,934
11/12/2022	24,084
11/13/2022	28,687
11/14/2022	25,088
11/15/2022	24,787
11/16/2022	24,881
11/17/2022	23,774
11/18/2022	26,938
11/19/2022	30,179

Maximum Flows (gal/day)		
	2022	2023
Jan	-	37,762
Feb	-	33,315
Mar	-	36,792
Apr	-	40,745
May	-	35,122
Jun	-	29,660
Jul	-	28,201
Aug	-	27,615
Sep	25,184	29,869
Oct	25,835	34,482
Nov	32,384	25,883
Dec	38,471	-
Max =	38,471	40,745



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Date	WWTP Daily Flow (Gal)
11/20/2022	32,384
11/21/2022	27,957
11/22/2022	26,519
11/23/2022	25,266
11/24/2022	25,466
11/25/2022	24,563
11/26/2022	25,312
11/27/2022	27,406
11/28/2022	23,527
11/29/2022	26,024
11/30/2022	24,717
12/1/2022	32,397
12/2/2022	33,318
12/3/2022	33,797
12/4/2022	34,071
12/5/2022	27,528
12/6/2022	27,361
12/7/2022	23,993
12/8/2022	27,707
12/9/2022	25,670
12/10/2022	24,844
12/11/2022	26,362
12/12/2022	23,735
12/13/2022	24,465
12/14/2022	24,589
12/15/2022	22,615
12/16/2022	23,119
12/17/2022	26,134
12/18/2022	27,768
12/19/2022	26,740
12/20/2022	25,575
12/21/2022	26,376
12/22/2022	33,399
12/23/2022	33,521
12/24/2022	32,100
12/25/2022	30,204
12/26/2022	38,471
12/27/2022	31,944
12/28/2022	28,584
12/29/2022	29,263
12/30/2022	25,700
12/31/2022	30,868
1/1/2023	26,979
1/2/2023	24,657
1/3/2023	24,139

DRAFT

Date	WWTP Daily Flow (Gal)
1/4/2023	23,325
1/5/2023	21,585
1/6/2023	23,053
1/7/2023	23,396
1/8/2023	25,457
1/9/2023	22,691
1/10/2023	22,026
1/11/2023	21,054
1/12/2023	20,490
1/13/2023	22,790
1/14/2023	23,478
1/15/2023	23,010
1/16/2023	23,287
1/17/2023	21,438
1/18/2023	22,399
1/19/2023	22,582
1/20/2023	22,759
1/21/2023	22,510
1/22/2023	25,416
1/23/2023	29,579
1/24/2023	28,293
1/25/2023	26,588
1/26/2023	28,900
1/27/2023	26,871
1/28/2023	26,971
1/29/2023	25,950
1/30/2023	33,549
1/31/2023	37,762
2/1/2023	33,315
2/2/2023	30,200
2/3/2023	28,488
2/4/2023	27,900
2/5/2023	28,317
2/6/2023	26,933
2/7/2023	27,612
2/8/2023	29,003
2/9/2023	27,071
2/10/2023	29,335
2/11/2023	29,516
2/12/2023	30,214
2/13/2023	29,335
2/14/2023	27,283
2/15/2023	28,947
2/16/2023	29,204
2/17/2023	28,864

DRAFT

Date	WWTP Daily Flow (Gal)
2/18/2023	30,225
2/19/2023	29,931
2/20/2023	28,768
2/21/2023	28,922
2/22/2023	27,059
2/23/2023	28,824
2/24/2023	29,758
2/25/2023	29,408
2/26/2023	32,274
2/27/2023	30,546
2/28/2023	30,455
3/1/2023	28,805
3/2/2023	29,424
3/3/2023	30,729
3/4/2023	29,045
3/5/2023	31,413
3/6/2023	29,070
3/7/2023	26,771
3/8/2023	27,896
3/9/2023	27,748
3/10/2023	32,571
3/11/2023	32,217
3/12/2023	32,997
3/13/2023	32,784
3/14/2023	36,792
3/15/2023	36,340
3/16/2023	29,893
3/17/2023	21,548
3/18/2023	2,624
3/19/2023	733
3/20/2023	30,971
3/21/2023	35,097
3/22/2023	25,427
3/23/2023	26,145
3/24/2023	28,271
3/25/2023	30,786
3/26/2023	29,067
3/27/2023	31,761
3/28/2023	36,349
3/29/2023	36,726
3/30/2023	32,371
3/31/2023	34,009
4/1/2023	32,346
4/2/2023	30,599
4/3/2023	25,694

DRAFT

Date	WWTP Daily Flow (Gal)
4/4/2023	29,799
4/5/2023	24,341
4/6/2023	31,160
4/7/2023	27,570
4/8/2023	31,090
4/9/2023	34,643
4/10/2023	35,151
4/11/2023	40,745
4/12/2023	32,479
4/13/2023	40,508
4/14/2023	32,938
4/15/2023	29,412
4/16/2023	31,285
4/17/2023	24,546
4/18/2023	24,079
4/19/2023	23,901
4/20/2023	21,538
4/21/2023	23,953
4/22/2023	24,038
4/23/2023	26,450
4/24/2023	26,732
4/25/2023	24,089
4/26/2023	21,489
4/27/2023	23,572
4/28/2023	21,536
4/29/2023	23,517
4/30/2023	23,854
5/1/2023	24,096
5/2/2023	21,363
5/3/2023	21,201
5/4/2023	18,638
5/5/2023	18,788
5/6/2023	18,508
5/7/2023	23,897
5/8/2023	21,658
5/9/2023	18,924
5/10/2023	20,916
5/11/2023	18,759
5/12/2023	18,310
5/13/2023	18,725
5/14/2023	20,857
5/15/2023	21,164
5/16/2023	18,701
5/17/2023	18,277
5/18/2023	25,854

DRAFT

Date	WWTP Daily Flow (Gal)
5/19/2023	24,191
5/20/2023	26,770
5/21/2023	30,925
5/22/2023	33,890
5/23/2023	34,283
5/24/2023	34,423
5/25/2023	35,122
5/26/2023	34,026
5/27/2023	31,852
5/28/2023	26,703
5/29/2023	28,482
5/30/2023	26,719
5/31/2023	21,694
6/1/2023	28,574
6/2/2023	27,087
6/3/2023	24,296
6/4/2023	23,144
6/5/2023	23,240
6/6/2023	23,320
6/7/2023	21,235
6/8/2023	23,245
6/9/2023	25,078
6/10/2023	21,515
6/11/2023	22,785
6/12/2023	24,311
6/13/2023	21,694
6/14/2023	21,396
6/15/2023	20,903
6/16/2023	18,585
6/17/2023	22,711
6/18/2023	21,160
6/19/2023	29,660
6/20/2023	27,416
6/21/2023	22,261
6/22/2023	19,641
6/23/2023	25,024
6/24/2023	23,254
6/25/2023	23,473
6/26/2023	25,802
6/27/2023	25,855
6/28/2023	23,293
6/29/2023	22,501
6/30/2023	23,188
7/1/2023	24,358
7/2/2023	25,448

DRAFT

Date	WWTP Daily Flow (Gal)
7/3/2023	25,982
7/4/2023	21,626
7/5/2023	23,497
7/6/2023	28,201
7/7/2023	21,472
7/8/2023	25,471
7/9/2023	26,108
7/10/2023	23,721
7/11/2023	23,773
7/12/2023	25,468
7/13/2023	22,065
7/14/2023	21,548
7/15/2023	23,454
7/16/2023	25,917
7/17/2023	27,114
7/18/2023	22,902
7/19/2023	25,269
7/20/2023	23,704
7/21/2023	20,969
7/22/2023	23,193
7/23/2023	25,546
7/24/2023	21,473
7/25/2023	22,903
7/26/2023	23,239
7/27/2023	21,188
7/28/2023	21,086
7/29/2023	20,839
7/30/2023	20,869
7/31/2023	25,207
8/1/2023	23,281
8/2/2023	25,242
8/3/2023	23,552
8/4/2023	27,353
8/5/2023	27,615
8/6/2023	26,135
8/7/2023	19,418
8/8/2023	20,708
8/9/2023	20,493
8/10/2023	25,158
8/11/2023	18,905
8/12/2023	22,672
8/13/2023	20,863
8/14/2023	23,091
8/15/2023	26,546
8/16/2023	23,364

DRAFT

Date	WWTP Daily Flow (Gal)
8/17/2023	20,953
8/18/2023	20,979
8/19/2023	23,088
8/20/2023	25,282
8/21/2023	21,264
8/22/2023	20,947
8/23/2023	21,398
8/24/2023	19,179
8/25/2023	20,821
8/26/2023	23,022
8/27/2023	25,187
8/28/2023	21,288
8/29/2023	25,241
8/30/2023	19,288
8/31/2023	21,345
9/1/2023	18,874
9/2/2023	22,805
9/3/2023	29,310
9/4/2023	28,498
9/5/2023	21,571
9/6/2023	23,317
9/7/2023	23,228
9/8/2023	21,188
9/9/2023	23,023
9/10/2023	25,779
9/11/2023	21,589
9/12/2023	21,390
9/13/2023	21,897
9/14/2023	22,410
9/15/2023	20,998
9/16/2023	25,437
9/17/2023	25,749
9/18/2023	21,183
9/19/2023	20,946
9/20/2023	23,156
9/21/2023	29,869
9/22/2023	28,494
9/23/2023	21,571
9/24/2023	25,457
9/25/2023	23,597
9/26/2023	23,159
9/27/2023	23,513
9/28/2023	21,453
9/29/2023	21,423
9/30/2023	21,131

DRAFT

Date	WWTP Daily Flow (Gal)
10/1/2023	23,525
10/2/2023	21,373
10/3/2023	34,482
10/4/2023	22,656
10/5/2023	18,828
10/6/2023	20,662
10/7/2023	18,862
10/8/2023	25,364
10/9/2023	19,095
10/10/2023	20,610
10/11/2023	19,233
10/12/2023	25,139
10/13/2023	21,503
10/14/2023	22,948
10/15/2023	25,232
10/16/2023	21,278
10/17/2023	18,952
10/18/2023	19,691
10/19/2023	19,887
10/20/2023	19,852
10/21/2023	21,080
10/22/2023	21,498
10/23/2023	21,037
10/24/2023	19,296
10/25/2023	23,540
10/26/2023	21,201
10/27/2023	21,472
10/28/2023	21,441
10/29/2023	25,601
10/30/2023	19,540
10/31/2023	21,039
11/1/2023	19,018
11/2/2023	23,133
11/3/2023	21,426
11/4/2023	21,372
11/5/2023	23,102
11/6/2023	21,087
11/7/2023	21,195
11/8/2023	21,333
11/9/2023	21,210
11/10/2023	19,231
11/11/2023	20,902
11/12/2023	24,968
11/13/2023	19,616
11/14/2023	20,779

DRAFT

Date	WWTP Daily Flow (Gal)
11/15/2023	20,985
11/16/2023	19,031
11/17/2023	20,502
11/18/2023	22,799
11/19/2023	23,561
11/20/2023	21,274
11/21/2023	23,089
11/22/2023	23,674
11/23/2023	23,252
11/24/2023	21,234
11/25/2023	25,289
11/26/2023	25,883

DRAFT

2024 & 2025 Raw WW Flow Data from Manual LS Run Times & Summaries

Project: City of Tetonia WWFPS
Project Number: 16084
Last Revised On: 2/9/2026
Created By: Laura Radke, PE

Legend:
Value Adjusted*
Input
*Mannually recorded value adjusted due to error

Assumptions:

LS #1 Pump* = 363.0 gpm
LS #2 Pump* = 363.0 gpm
**See 'Pump Info' on page 14 for flow determination of Lift Station Pumps.*

Color Ramp:
Low Flow
Medium Flow
High Flow

Sources: Hand Recorded LS Run Hours provided by City (2024 Copy of Sewer_Pumps Data & 2025 Sewer and Pumps data)

Date	LS #1 Pump Run Time (hrs)	LS #2 Pump Run Time (hrs)	LS #1 Hrs/day	LS #2 Hrs/day	LS #1 gpd	LS #2 gpd	Total gpd	Total gpm
1/1/2024								
1/2/2024								
1/3/2024	2134.6	2768.8						
1/4/2024	2135.2	2769.3	0.60	0.50	13,068	10,890	23,958	16.6
1/5/2024	2135.6	2769.8	0.40	0.50	8,712	10,890	19,602	13.6
1/6/2024								
1/7/2024								
1/8/2024	2137.2	2771.3	0.53	0.50	11,616	10,890	22,506	15.6
1/9/2024	2137.7	2771.8	0.50	0.50	10,890	10,890	21,780	15.1
1/10/2024	2138.3	2771.9	0.60	0.10	13,068	2,178	15,246	10.6
1/11/2024	2139.2	2772.1	0.90	0.20	19,602	4,356	23,958	16.6
1/12/2024	2140.3	2772.9	1.10	0.80	23,958	17,424	41,382	28.7
1/13/2024								
1/14/2024								
1/15/2024								
1/16/2024	2142.1	2774.5	0.45	0.40	9,801	8,712	18,513	12.9
1/17/2024	2142.9	2775.5	0.80	1.00	17,424	21,780	39,204	27.2
1/18/2024	2143.5	2776.6	0.60	1.10	13,068	23,958	37,026	25.7
1/19/2024	2144.1	2777.3	0.60	0.70	13,068	15,246	28,314	19.7
1/20/2024								
1/21/2024								
1/22/2024	2145.1	2778.5	0.33	0.40	7,260	8,712	15,972	11.1
1/23/2024	2146.2	2780.6	1.10	2.10	23,958	45,738	69,696	48.4
1/24/2024	2146.8	2781.3	0.60	0.70	13,068	15,246	28,314	19.7
1/25/2024	2147.0	2781.9	0.20	0.60	4,356	13,068	17,424	12.1
1/26/2024	2147.7	2782.3	0.70	0.40	15,246	8,712	23,958	16.6
1/27/2024								
1/28/2024								
1/29/2024	2149.3	2783.8	0.53	0.50	11,616	10,890	22,506	15.6
1/30/2024	2149.8	2784.4	0.50	0.60	10,890	13,068	23,958	16.6
1/31/2024								
2/1/2024	2150.7	2785.4	0.45	0.50	9,801	10,890	20,691	14.4
2/2/2024	2151.2	2785.9	0.50	0.50	10,890	10,890	21,780	15.1
2/3/2024								
2/4/2024								

DRAFT

Sources: *Hand Recorded LS Run Hours provided by City (2024 Copy of Sewer_Pumps Data & 2025 Sewer and Pumps data)*

Date	LS #1 Pump Run Time (hrs)	LS #2 Pump Run Time (hrs)	LS #1 Hrs/day	LS #2 Hrs/day	LS #1 gpd	LS #2 gpd	Total gpd	Total gpm
2/5/2024	2152.9	2788.0	0.57	0.70	12,342	15,246	27,588	19.2
2/6/2024	2153.5	2788.8	0.60	0.80	13,068	17,424	30,492	21.2
2/7/2024	2154.0	2789.8	0.50	1.00	10,890	21,780	32,670	22.7
2/8/2024	2154.5	2791.0	0.50	1.20	10,890	26,136	37,026	25.7
2/9/2024	2155.0	2791.2	0.50	0.20	10,890	4,356	15,246	10.6
2/10/2024								
2/11/2024								
2/12/2024	2156.4	2804.0	0.47	4.27	10,164	92,928	103,092	71.6
2/13/2024	2156.9	2807.3	0.50	3.30	10,890	71,874	82,764	57.5
2/14/2024	2157.3	2810.6	0.40	3.30	8,712	71,874	80,586	56.0
2/15/2024	2157.8	2814.3	0.50	3.70	10,890	80,586	91,476	63.5
2/16/2024	2158.3	2817.3	0.50	3.00	10,890	65,340	76,230	52.9
2/17/2024								
2/18/2024								
2/19/2024								
2/20/2024	2160.5	2828.4	0.55	2.77	11,979	60,439	72,418	50.3
2/21/2024	2161.0	2829.8	0.50	1.40	10,890	30,492	41,382	28.7
2/22/2024	2161.5	2830.8	0.50	1.00	10,890	21,780	32,670	22.7
2/23/2024	2162.1	2832.0	0.60	1.20	13,068	26,136	39,204	27.2
2/24/2024								
2/25/2024								
2/26/2024								
2/27/2024	2164.2	2840.3	0.52	2.08	11,434	45,194	56,628	39.3
2/28/2024	2164.7	2841.9	0.50	1.60	10,890	34,848	45,738	31.8
2/29/2024	2165.1	2843.0	0.40	1.10	8,712	23,958	32,670	22.7
3/1/2024	2165.7	2844.6	0.60	1.60	13,068	34,848	47,916	33.3
3/2/2024								
3/3/2024								
3/4/2024	2168.3	2848.0	0.87	1.13	18,876	24,684	43,560	30.3
3/5/2024	2169.3	2851.1	1.00	3.10	21,780	67,518	89,298	62.0
3/6/2024	2170.4	2852.4	1.10	1.30	23,958	28,314	52,272	36.3
3/7/2024	2172.4	2854.3	2.00	1.90	43,560	41,382	84,942	59.0
3/8/2024	2174.2	2855.4	1.80	1.10	39,204	23,958	63,162	43.9
3/9/2024								
3/10/2024								
3/11/2024	2178.6	2857.3	1.47	0.63	31,944	13,794	45,738	31.8
3/12/2024	2179.3	2858.6	0.70	1.30	15,246	28,314	43,560	30.3
3/13/2024	2171.9	2861.7	0.00	3.10	0	67,518	67,518	46.9
3/14/2024	2172.5	2863.4	0.60	1.70	13,068	37,026	50,094	34.8
3/15/2024	2172.9	2864.6	0.40	1.20	8,712	26,136	34,848	24.2
3/16/2024								
3/17/2024								
3/18/2024	2174.8	2869.5	0.63	1.63	13,794	35,574	49,368	34.3
3/19/2024	2175.4	2871.2	0.60	1.70	13,068	37,026	50,094	34.8
3/20/2024	2175.9	2872.9	0.50	1.70	10,890	37,026	47,916	33.3
3/21/2024	2176.6	2874.8	0.70	1.90	15,246	41,382	56,628	39.3
3/22/2024	2177.2	2877.0	0.60	2.20	13,068	47,916	60,984	42.3

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Sources: *Hand Recorded LS Run Hours provided by City (2024 Copy of Sewer_Pumps Data & 2025 Sewer and Pumps data)*

Date	LS #1 Pump Run Time (hrs)	LS #2 Pump Run Time (hrs)	LS #1 Hrs/day	LS #2 Hrs/day	LS #1 gpd	LS #2 gpd	Total gpd	Total gpm
3/23/2024								
3/24/2024								
3/25/2024	2178.9	2882.2	0.57	1.73	12,342	37,752	50,094	34.8
3/26/2024	2179.2	2884.2	0.30	2.00	6,534	43,560	50,094	34.8
3/27/2024	2179.9	2885.5	0.70	1.30	15,246	28,314	43,560	30.3
3/28/2024	2180.4	2886.9	0.50	1.40	10,890	30,492	41,382	28.7
3/29/2024	2180.9	2888.0	0.50	1.10	10,890	23,958	34,848	24.2
3/30/2024								
3/31/2024								
4/1/2024	2182.6	2893.2	0.57	1.73	12,342	37,752	50,094	34.8
4/2/2024	2183.4	2894.6	0.80	1.40	17,424	30,492	47,916	33.3
4/3/2024	2183.6	2895.1	0.20	0.50	4,356	10,890	15,246	10.6
4/4/2024	2184.1	2896.2	0.50	1.10	10,890	23,958	34,848	24.2
4/5/2024	2184.7	2896.8	0.60	0.60	13,068	13,068	26,136	18.2
4/6/2024								
4/7/2024								
4/8/2024	2185.7	2904.5	0.33	2.57	7,260	55,902	63,162	43.9
4/9/2024	2186.2	2906.0	0.50	1.50	10,890	32,670	43,560	30.3
4/10/2024	2186.5	2907.4	0.30	1.40	6,534	30,492	37,026	25.7
4/11/2024	2186.9	2908.7	0.40	1.30	8,712	28,314	37,026	25.7
4/12/2024	2187.3	2909.8	0.40	1.10	8,712	23,958	32,670	22.7
4/13/2024								
4/14/2024								
4/15/2024	2188.5	2913.5	0.40	1.23	8,712	26,862	35,574	24.7
4/16/2024	2188.9	2914.5	0.40	1.00	8,712	21,780	30,492	21.2
4/17/2024	2189.2	2915.9	0.30	1.40	6,534	30,492	37,026	25.7
4/18/2024	2189.6	2917.3	0.40	1.40	8,712	30,492	39,204	27.2
4/19/2024	2189.9	2918.1	0.30	0.80	6,534	17,424	23,958	16.6
4/20/2024								
4/21/2024								
4/22/2024	2191.1	2922.7	0.40	1.53	8,712	33,396	42,108	29.2
4/23/2024	2191.6	2924.1	0.50	1.40	10,890	30,492	41,382	28.7
4/24/2024	2192.0	2925.4	0.40	1.30	8,712	28,314	37,026	25.7
4/25/2024	2192.3	2926.1	0.30	0.70	6,534	15,246	21,780	15.1
4/26/2024	2192.7	2927,4	0.40		8,712		8,712	6.0
4/27/2024								
4/28/2024								
4/29/2024	2194.2	2931.8	0.50		10,890		10,890	7.6
4/30/2024	2194.6	2932.8	0.40	1.00	8,712	21,780	30,492	21.2
5/1/2024	2195.0	2933.7	0.40	0.90	8,712	19,602	28,314	19.7
5/2/2024	2195.5	2934.8	0.50	1.10	10,890	23,958	34,848	24.2
5/3/2024	2195.8	2935.4	0.30	0.60	6,534	13,068	19,602	13.6
5/4/2024								
5/5/2024								
5/6/2024	2197.0	2938.6	0.40	1.07	8,712	23,232	31,944	22.2
5/7/2024	2197.5	2939.9	0.50	1.30	10,890	28,314	39,204	27.2
5/8/2024	2198.0	2941.1	0.50	1.20	10,890	26,136	37,026	25.7

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Date	LS #1 Pump Run Time (hrs)	LS #2 Pump Run Time (hrs)	LS #1 Hrs/day	LS #2 Hrs/day	LS #1 gpd	LS #2 gpd	Total gpd	Total gpm
5/9/2024	2198.4	2941.9	0.40	0.80	8,712	17,424	26,136	18.2
5/10/2024	2198.7	2942.8	0.30	0.90	6,534	19,602	26,136	18.1
5/11/2024								
5/12/2024								
5/13/2024	2200.0	2947.1	0.43	1.43	9,438	31,218	40,656	28.2
5/14/2024	2200.4	2948.5	0.40	1.40	8,712	30,492	39,204	27.2
5/15/2024	2201.0	2950.3	0.60	1.80	13,068	39,204	52,272	36.3
5/16/2024	2201.3	2952.1	0.30	1.80	6,534	39,204	45,738	31.8
5/17/2024	2201.8	2952.4	0.50	0.30	10,890	6,534	17,424	12.1
5/18/2024								
5/19/2024								
5/20/2024	2202.5	2953.8	0.23	0.47	5,082	10,164	15,246	10.6
5/21/2024	2203.4	2954.1	0.90	0.30	19,602	6,534	26,136	18.1
5/22/2024	2203.8	2954.5	0.40	0.40	8,712	8,712	17,424	12.1
5/23/2024	2204.2	2954.9	0.40	0.40	8,712	8,712	17,424	12.1
5/24/2024	2204.6	2955.2	0.40	0.30	8,712	6,534	15,246	10.6
5/25/2024								
5/26/2024								
5/27/2024								
5/28/2024	2206.3	2956.7	0.43	0.38	9,257	8,168	17,424	12.1
5/29/2024	2206.7	2957.1	0.40	0.40	8,712	8,712	17,424	12.1
5/30/2024	2207.2	2957.6	0.50	0.50	10,890	10,890	21,780	15.1
5/31/2024	2207.8	2958.1	0.60	0.50	13,068	10,890	23,958	16.6
6/1/2024								
6/2/2024	2209.3	2959.7	0.75	0.80	16,335	17,424	33,759	23.4
6/3/2024	2209.8	2960.1	0.50	0.40	10,890	8,712	19,602	13.6
6/4/2024	2210.5	2960.9	0.70	0.80	15,246	17,424	32,670	22.7
6/5/2024	2211.2	2961.5	0.70	0.60	15,246	13,068	28,314	19.7
6/6/2024	2211.8	2962.1	0.60	0.60	13,068	13,068	26,136	18.2
6/7/2024								
6/8/2024								
6/9/2024	2213.5	2963.8	0.57	0.57	12,342	12,342	24,684	17.1
6/10/2024	2213.9	2964.1	0.40	0.30	8,712	6,534	15,246	10.6
6/11/2024	2214.4	2964.7	0.50	0.60	10,890	13,068	23,958	16.6
6/12/2024	2214.8	2965.0	0.40	0.30	8,712	6,534	15,246	10.6
6/13/2024	2215.3	2965.4	0.50	0.40	10,890	8,712	19,602	13.6
6/14/2024								
6/15/2024								
6/16/2024	2216.7	2966.8	0.47	0.47	10,164	10,164	20,328	14.1
6/17/2024	2217.1	2967.2	0.40	0.40	8,712	8,712	17,424	12.1
6/18/2024	2217.6	2967.8	0.50	0.60	10,890	13,068	23,958	16.6
6/19/2024	2218.1	2968.4	0.50	0.60	10,890	13,068	23,958	16.6
6/20/2024		2968.8		0.40		8,712	8,712	6.1
6/21/2024								
6/22/2024								
6/23/2024								
6/24/2024	2219.6	2969.6	0.30	0.20	6,534	4,356	10,890	7.6

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Date	LS #1 Pump Run Time (hrs)	LS #2 Pump Run Time (hrs)	LS #1 Hrs/day	LS #2 Hrs/day	LS #1 gpd	LS #2 gpd	Total gpd	Total gpm
6/25/2024	2220.0	2970.0	0.40	0.40	8,712	8,712	17,424	12.1
6/26/2024	2220.4	2970.6	0.40	0.60	8,712	13,068	21,780	15.1
6/27/2024	2220.6	2971.3	0.20	0.70	4,356	15,246	19,602	13.6
6/28/2024		2971.6		0.30		6,534	6,534	4.5
6/29/2024								
6/30/2024								
7/1/2024	2221.9	2975.0	0.33	1.13	7,079	24,684	31,763	22.1
7/2/2024	2222.7	2976.4	0.80	1.40	17,424	30,492	47,916	33.3
7/3/2024	2223.5	2977.3	0.80	0.90	17,424	19,602	37,026	25.7
7/4/2024								
7/5/2024	2224.0	2978.2	0.25	0.45	5,445	9,801	15,246	10.6
7/6/2024								
7/7/2024								
7/8/2024	2225.5	2978.9	0.50	0.23	10,890	5,082	15,972	11.1
7/9/2024	2225.9	2979.3	0.40	0.40	8,712	8,712	17,424	12.1
7/10/2024	2226.5	2979.7	0.60	0.40	13,068	8,712	21,780	15.1
7/11/2024	2226.9	2980.1	0.40	0.40	8,712	8,712	17,424	12.1
7/12/2024	2227.3	2980.5	0.40	0.40	8,712	8,712	17,424	12.1
7/13/2024								
7/14/2024								
7/15/2024	2228.4	2981.9	0.37	0.47	7,986	10,164	18,150	12.6
7/16/2024	2228.8	2982.2	0.40	0.30	8,712	6,534	15,246	10.6
7/17/2024	2229.2	2982.6	0.40	0.40	8,712	8,712	17,424	12.1
7/18/2024	2229.5	2982.9	0.30	0.30	6,534	6,534	13,068	9.1
7/19/2024	2230.0	2983.4	0.50	0.50	10,890	10,890	21,780	15.1
7/20/2024								
7/21/2024								
7/22/2024	2231.2	2984.5	0.40	0.37	8,712	7,986	16,698	11.6
7/23/2024	2231.7	2984.9	0.50	0.40	10,890	8,712	19,602	13.6
7/24/2024	2232.0	2985.3	0.30	0.40	6,534	8,712	15,246	10.6
7/25/2024	2232.4	2985.7	0.40	0.40	8,712	8,712	17,424	12.1
7/26/2024	2232.7	2986.0	0.30	0.30	6,534	6,534	13,068	9.1
7/27/2024								
7/28/2024								
7/29/2024	2233.7	2986.9	0.33	0.30	7,260	6,534	13,794	9.6
7/30/2024	2234.0	2987.2	0.30	0.30	6,534	6,534	13,068	9.1
7/31/2024	2234.4	2987.5	0.40	0.30	8,712	6,534	15,246	10.6
8/1/2024	2234.8	2987.9	0.40	0.40	8,712	8,712	17,424	12.1
8/2/2024	2235.1	2988.2	0.30	0.30	6,534	6,534	13,068	9.1
8/3/2024								
8/4/2024								
8/5/2024	2236.6	2989.5	0.50	0.43	10,890	9,438	20,328	14.1
8/6/2024	2237.0	2989.9	0.40	0.40	8,712	8,712	17,424	12.1
8/7/2024	2237.2	2990.3	0.20	0.40	4,356	8,712	13,068	9.1
8/8/2024	2237.6	2990.6	0.40	0.30	8,712	6,534	15,246	10.6
8/9/2024	2237.9	2990.9	0.30	0.30	6,534	6,534	13,068	9.1
8/10/2024								

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Date	LS #1 Pump Run Time (hrs)	LS #2 Pump Run Time (hrs)	LS #1 Hrs/day	LS #2 Hrs/day	LS #1 gpd	LS #2 gpd	Total gpd	Total gpm
8/11/2024								
8/12/2024	2239.0	2991.9	0.37	0.33	7,986	7,260	15,246	10.6
8/13/2024	2239.3	2992.2	0.30	0.30	6,534	6,534	13,068	9.1
8/14/2024	2239.8	2992.6	0.50	0.40	10,890	8,712	19,602	13.6
8/15/2024	2240.2	2992.9	0.40	0.30	8,712	6,534	15,246	10.6
8/16/2024		2993.2		0.30		6,534	6,534	4.5
8/17/2024								
8/18/2024		2994.2		0.50		10,890	10,890	7.6
8/19/2024	2241.5	2994.4	0.33	0.20	7,079	4,356	11,435	7.9
8/20/2024	2241.8	2994.7	0.30	0.30	6,534	6,534	13,068	9.1
8/21/2024	2242.1	2995.0	0.30	0.30	6,534	6,534	13,068	9.1
8/22/2024	2242.4	2995.4	0.30	0.40	6,534	8,712	15,246	10.6
8/23/2024	2242.8	2995.3	0.40	0.00	8,712	0	8,712	6.1
8/24/2024								
8/25/2024								
8/26/2024	2243.8	2996.3	0.33	0.33	7,260	7,260	14,520	10.1
8/27/2024	2244.2	2996.6	0.40	0.30	8,712	6,534	15,246	10.6
8/28/2024	2244.6	2996.9	0.40	0.30	8,712	6,534	15,246	10.6
8/29/2024	2244.8	2997.2	0.20	0.30	4,356	6,534	10,890	7.6
8/30/2024	2245.2	2997.4	0.40	0.20	8,712	4,356	13,068	9.1
8/31/2024								
9/1/2024								
9/2/2024	2246.3	2998.5	0.37	0.37	7,986	7,986	15,972	11.1
9/3/2024	2246.6	2998.9	0.30	0.40	6,534	8,712	15,246	10.6
9/4/2024	2247.0	2999.1	0.40	0.20	8,712	4,356	13,068	9.1
9/5/2024	2247.3	2999.5	0.30	0.40	6,534	8,712	15,246	10.6
9/6/2024	2247.7	2999.8	0.40	0.30	8,712	6,534	15,246	10.6
9/7/2024								
9/8/2024								
9/9/2024	2249.0	3000.8	0.43	0.33	9,438	7,260	16,698	11.6
9/10/2024	2249.4	3001.1	0.40	0.30	8,712	6,534	15,246	10.6
9/11/2024	2249.8	3001.4	0.40	0.30	8,712	6,534	15,246	10.6
9/12/2024	2250.2	3001.8	0.40	0.40	8,712	8,712	17,424	12.1
9/13/2024	2250.6	3002.1	0.40	0.30	8,712	6,534	15,246	10.6
9/14/2024								
9/15/2024								
9/16/2024	2251,8	3003,2						
9/17/2024	2252.3	3003.7						
9/18/2024	2252,8	3004.1		0.40		8,712	8,712	6.1
9/19/2024	2253.2	3004.4		0.30		6,534	6,534	4.5
9/20/2024	2253.6	3004.9	0.40	0.50	8,712	10,890	19,602	13.6
9/21/2024								
9/22/2024								
9/23/2024	2254.8	3006.0	0.40	0.37	8,712	7,986	16,698	11.6
9/24/2024	2255.2	3006.3	0.40	0.30	8,712	6,534	15,246	10.6
9/25/2024	2255.6	3006.8	0.40	0.50	8,712	10,890	19,602	13.6
9/26/2024	2256.0	3006.9	0.40	0.10	8,712	2,178	10,890	7.6

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Date	LS #1 Pump Run Time (hrs)	LS #2 Pump Run Time (hrs)	LS #1 Hrs/day	LS #2 Hrs/day	LS #1 gpd	LS #2 gpd	Total gpd	Total gpm
9/27/2024	2256.4	3007.4	0.40	0.50	8,712	10,890	19,602	13.6
9/28/2024								
9/29/2024								
9/30/2024	2257.7	3008.4	0.43	0.33	9,438	7,260	16,698	11.6
10/1/2024	2257.9	3008.8	0.20	0.40	4,356	8,712	13,068	9.1
10/2/2024	2258.1	3009.0	0.20	0.20	4,356	4,356	8,712	6.0
10/3/2024	2258.4	3009.2	0.30	0.20	6,534	4,356	10,890	7.6
10/4/2024	2258.8	3009.6	0.40	0.40	8,712	8,712	17,424	12.1
10/5/2024								
10/6/2024								
10/7/2024	2259.9	3010.7	0.37	0.37	7,986	7,986	15,972	11.1
10/8/2024	2260.2	3011.0	0.30	0.30	6,534	6,534	13,068	9.1
10/9/2024	2260.5	3011.2	0.30	0.20	6,534	4,356	10,890	7.6
10/10/2024	2260.8	3011.6	0.30	0.40	6,534	8,712	15,246	10.6
10/11/2024	2261.2	3011.8	0.40	0.20	8,712	4,356	13,068	9.1
10/12/2024								
10/13/2024								
10/14/2024	2262.1	3012.6	0.30	0.27	6,534	5,808	12,342	8.6
10/15/2024	2262.4	3012.9	0.30	0.30	6,534	6,534	13,068	9.1
10/16/2024	2262.8	3013.1	0.40	0.20	8,712	4,356	13,068	9.1
10/17/2024	2263.1	3013.4	0.30	0.30	6,534	6,534	13,068	9.1
10/18/2024	2263.5	3013.7	0.40	0.30	8,712	6,534	15,246	10.6
10/19/2024								
10/20/2024								
10/21/2024	2264.6	3014.7	0.37	0.33	7,986	7,260	15,246	10.6
10/22/2024	2264.9	3015.0	0.30	0.30	6,534	6,534	13,068	9.1
10/23/2024	2265.2	3015.5	0.30	0.50	6,534	10,890	17,424	12.1
10/24/2024	2265.6	3015.7	0.40	0.20	8,712	4,356	13,068	9.1
10/25/2024	2266.0	3015.8	0.40	0.10	8,712	2,178	10,890	7.6
10/26/2024								
10/27/2024								
10/28/2024	2267.0	3016.7.	0.33		7,260		7,260	5.0
10/29/2024	2267.4	3016.9	0.40		8,712		8,712	6.1
10/30/2024	2267.6	3017.2	0.20	0.30	4,356	6,534	10,890	7.6
10/31/2024	2268.0	3017.5	0.40	0.30	8,712	6,534	15,246	10.6
11/1/2024	2268.4	3017.9	0.40	0.40	8,712	8,712	17,424	12.1
11/2/2024								
11/3/2024								
11/4/2024	2269.5	3019.0	0.37	0.37	7,986	7,986	15,972	11.1
11/5/2024	2269.8	3019.3	0.30	0.30	6,534	6,534	13,068	9.1
11/6/2024	2270.1	3019.6	0.30	0.30	6,534	6,534	13,068	9.1
11/7/2024	2270.5	3019.9	0.40	0.30	8,712	6,534	15,246	10.6
11/8/2024	2271.0	3020.3	0.50	0.40	10,890	8,712	19,602	13.6
11/9/2024								
11/10/2024								
11/11/2024								
11/12/2024	2272.6	3021.9	0.40	0.40	8,712	8,712	17,424	12.1

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Sources: *Hand Recorded LS Run Hours provided by City (2024 Copy of Sewer_Pumps Data & 2025 Sewer and Pumps data)*

Date	LS #1 Pump Run Time (hrs)	LS #2 Pump Run Time (hrs)	LS #1 Hrs/day	LS #2 Hrs/day	LS #1 gpd	LS #2 gpd	Total gpd	Total gpm
11/13/2024	2273.1	3022.4	0.50	0.50	10,890	10,890	21,780	15.1
11/14/2024	2273,6	3022.9		0.50		10,890	10,890	7.6
11/15/2024	2274.1	3023.3		0.40		8,712	8,712	6.1
11/16/2024								
11/17/2024								
11/18/2024	2275.7	3024.7	0.53	0.47	11,616	10,164	21,780	15.1
11/19/2024	2276.1	3025.1	0.40	0.40	8,712	8,712	17,424	12.1
11/20/2024	2276.5	3025.5	0.40	0.40	8,712	8,712	17,424	12.1
11/21/2024	2277.0	3026.0	0.50	0.50	10,890	10,890	21,780	15.1
11/22/2024	2277.4	3026.3	0.40	0.30	8,712	6,534	15,246	10.6
11/23/2024								
11/24/2024								
11/25/2024	2278.8	3027.5	0.47	0.40	10,164	8,712	18,876	13.1
11/26/2024	2279.2	3027.9	0.40	0.40	8,712	8,712	17,424	12.1
11/27/2024	2279.7	3020.3	0.50	0.00	10,890	0	10,890	7.6
11/28/2024								
11/29/2024	2281.2	3021.2	0.75	0.45	16,335	9,801	26,136	18.1
11/30/2024								
12/1/2024								
12/2/2024	2282.1	3030.6	0.30	3.13	6,534	68,244	74,778	51.9
12/3/2024	2282.7	3031.1	0.60	0.50	13,068	10,890	23,958	16.6
12/4/2024	2283.2	3031.5	0.50	0.40	10,890	8,712	19,602	13.6
12/5/2024	2283.7	3031.9	0.50	0.40	10,890	8,712	19,602	13.6
12/6/2024	2284.2	3032.4	0.50	0.50	10,890	10,890	21,780	15.1
12/7/2024								
12/8/2024								
12/9/2024	2285.8	3033.8	0.53	0.47	11,616	10,164	21,780	15.1
12/10/2024	2286.4	3034.4	0.60	0.60	13,068	13,068	26,136	18.1
12/11/2024	2286.8	3034.8	0.40	0.40	8,712	8,712	17,424	12.1
12/12/2024	2287.4	3035.2	0.60	0.40	13,068	8,712	21,780	15.1
12/13/2024	2287.9.	3035.7		0.50		10,890	10,890	7.6
12/14/2024								
12/15/2024								
12/16/2024	2288.0	3038.6		0.97		21,054	21,054	14.6
12/17/2024		3039.5		0.90		19,602	19,602	13.6
12/18/2024		3040.5		1.00		21,780	21,780	15.1
12/19/2024		3041.4		0.90		19,602	19,602	13.6
12/20/2024		3042.2		0.80		17,424	17,424	12.1
12/21/2024								
12/22/2024								
12/23/2024		3045.3		1.03		22,506	22,506	15.6
12/24/2024		3046.2		0.90		19,602	19,602	13.6
12/25/2024								
12/26/2024		3048.1		0.95		20,691	20,691	14.4
12/27/2024		3048.9		0.80		17,424	17,424	12.1
12/28/2024								
12/29/2024								

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Sources: *Hand Recorded LS Run Hours provided by City (2024 Copy of Sewer_Pumps Data & 2025 Sewer and Pumps data)*

Date	LS #1 Pump Run Time (hrs)	LS #2 Pump Run Time (hrs)	LS #1 Hrs/day	LS #2 Hrs/day	LS #1 gpd	LS #2 gpd	Total gpd	Total gpm
12/30/2024		3051.8		0.97		21,054	21,054	14.6
12/31/2024		3053.0		1.20		26,136	26,136	18.1
1/1/2025								
1/2/2025	2289.0	3054.5	0.06	0.75	1,281	16,335	17,616	12.2
1/3/2025	2289.7	3055.0	0.70	0.50	15,246	10,890	26,136	18.1
1/4/2025								
1/5/2025								
1/6/2025	2291.0	3056.6	0.43	0.53	9,438	11,616	21,054	14.6
1/7/2025	2291.6	3057.0	0.60	0.40	13,068	8,712	21,780	15.1
1/8/2025	2292.1	3057.4	0.50	0.40	10,890	8,712	19,602	13.6
1/9/2025	2292.6	3058.0	0.50	0.60	10,890	13,068	23,958	16.6
1/10/2025	2293.1	3058.5	0.50	0.50	10,890	10,890	21,780	15.1
1/11/2025								
1/12/2025								
1/13/2025	2294.8	3060.0	0.57	0.50	12,342	10,890	23,232	16.1
1/14/2025	2295.4	3060.7	0.60	0.70	13,068	15,246	28,314	19.7
1/15/2025	2296.0	3061.3	0.60	0.60	13,068	13,068	26,136	18.2
1/16/2025	2296.6	3061.9	0.60	0.60	13,068	13,068	26,136	18.1
1/17/2025		3062.5		0.60		13,068	13,068	9.1
1/18/2025								
1/19/2025								
1/20/2025								
1/21/2025	2299.9	3065.4	0.66	0.73	14,375	15,791	30,165	20.9
1/22/2025	2300.7	3066.0	0.80	0.60	17,424	13,068	30,492	21.2
1/23/2025	2301.4	3066.7	0.70	0.70	15,246	15,246	30,492	21.2
1/24/2025	2302.1	3067.3	0.70	0.60	15,246	13,068	28,314	19.7
1/25/2025								
1/26/2025								
1/27/2025	2304.4	3070.5	0.77	1.07	16,698	23,232	39,930	27.7
1/28/2025	2304.9	3071.2	0.50	0.70	10,890	15,246	26,136	18.1
1/29/2025	2305.6	3071.8	0.70	0.60	15,246	13,068	28,314	19.7
1/30/2025	2306.5	3072.2	0.90	0.40	19,602	8,712	28,314	19.7
1/31/2025	2307.0		0.50		10,890		10,890	7.6
2/1/2025								
2/2/2025								
2/3/2025	2308.8	3074.1	0.60	0.48	13,068	10,346	23,414	16.3
2/4/2025	2309.7	3075.0	0.90	0.90	19,602	19,602	39,204	27.2
2/5/2025	2310.4	3075.6	0.70	0.60	15,246	13,068	28,314	19.7
2/6/2025	2311.0	3076.3	0.60	0.70	13,068	15,246	28,314	19.7
2/7/2025	2311.6	3076.8	0.60	0.50	13,068	10,890	23,958	16.6
2/8/2025								
2/9/2025								
2/10/2025	2313.7	3079.1	0.70	0.77	15,246	16,698	31,944	22.2
2/11/2025	2314.4	3079.6	0.70	0.50	15,246	10,890	26,136	18.2
2/12/2025	2314.8	3080.0	0.40	0.40	8,712	8,712	17,424	12.1
2/13/2025	2315.6	3080.9	0.80	0.90	17,424	19,602	37,026	25.7
2/14/2025	2316.2	3081.4	0.60	0.50	13,068	10,890	23,958	16.6

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Date	LS #1 Pump Run Time (hrs)	LS #2 Pump Run Time (hrs)	LS #1 Hrs/day	LS #2 Hrs/day	LS #1 gpd	LS #2 gpd	Total gpd	Total gpm
2/15/2025								
2/16/2025								
2/17/2025								
2/18/2025	2319.0	3084.1	0.70	0.67	15,246	14,701	29,948	20.8
2/19/2025	2319.5	3084.6	0.50	0.50	10,890	10,890	21,780	15.1
2/20/2025	2320.1	3085.4	0.60	0.80	13,068	17,424	30,492	21.2
2/21/2025	2320.7	3085.9	0.60	0.50	13,068	10,890	23,958	16.6
2/22/2025								
2/23/2025								
2/24/2025	2322.6	3087.8	0.63	0.63	13,794	13,794	27,588	19.2
2/25/2025	2323.3	3088.5	0.70	0.70	15,246	15,246	30,492	21.2
2/26/2025	2324.0	3089.2	0.70	0.70	15,246	15,246	30,492	21.2
2/27/2025	2324.5	3089.7	0.50	0.50	10,890	10,890	21,780	15.1
2/28/2025	2325.1	3090.3	0.60	0.60	13,068	13,068	26,136	18.2
3/1/2025								
3/2/2025								
3/3/2025	2327.1	3092.3	0.67	0.67	14,520	14,520	29,040	20.2
3/4/2025	2327.8	3093.0	0.70	0.70	15,246	15,246	30,492	21.2
3/5/2025	2328.5	3093.6	0.70	0.60	15,246	13,068	28,314	19.7
3/6/2025	2329.2	3094.2	0.70	0.60	15,246	13,068	28,314	19.7
3/7/2025	2329.8	3094.9	0.60	0.70	13,068	15,246	28,314	19.7
3/8/2025								
3/9/2025								
3/10/2025	2331.7	3096.8	0.63	0.63	13,794	13,794	27,588	19.2
3/11/2025	2332.4	3097.6	0.70	0.80	15,246	17,424	32,670	22.7
3/12/2025	2333.1	3098.2	0.70	0.60	15,246	13,068	28,314	19.7
3/13/2025	2333.8	3098.9	0.70	0.70	15,246	15,246	30,492	21.2
3/14/2025	2334.2	3099.4	0.40	0.50	8,712	10,890	19,602	13.6
3/15/2025								
3/16/2025								
3/17/2025	2335.9	3101.1	0.57	0.57	12,342	12,342	24,684	17.1
3/18/2025	2336.5	3101.6	0.60	0.50	13,068	10,890	23,958	16.6
3/19/2025	2337.1	3102.3	0.60	0.70	13,068	15,246	28,314	19.7
3/20/2025	2337.6	3102.9	0.50	0.60	10,890	13,068	23,958	16.6
3/21/2025	2338.2	3103.3	0.60	0.40	13,068	8,712	21,780	15.1
3/22/2025								
3/23/2025								
3/24/2025	2339.9	3105.0	0.57	0.57	12,342	12,342	24,684	17.1
3/25/2025	2340.4	3105.7	0.50	0.70	10,890	15,246	26,136	18.1
3/26/2025	2340.5	3106.2	0.10	0.50	2,178	10,890	13,068	9.1
3/27/2025	2341.5	3106.7	1.00	0.50	21,780	10,890	32,670	22.7
3/28/2025	2342.0	3107.2	0.50	0.50	10,890	10,890	21,780	15.1
3/29/2025								
3/30/2025								
3/31/2025	2343.5	3108.8	0.50	0.53	10,890	11,616	22,506	15.6
4/1/2025		3109.4		0.60		13,068	13,068	9.1
4/2/2025	2344.2	3109.9	0.35	0.50	7,623	10,890	18,513	12.9

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Date	LS #1 Pump Run Time (hrs)	LS #2 Pump Run Time (hrs)	LS #1 Hrs/day	LS #2 Hrs/day	LS #1 gpd	LS #2 gpd	Total gpd	Total gpm
4/3/2025	2344.7	3110.3	0.50	0.40	10,890	8,712	19,602	13.6
4/4/2025	2345.1	3110.7	0.40	0.40	8,712	8,712	17,424	12.1
4/5/2025	2345.5		0.40		8,712		8,712	6.1
4/6/2025								
4/7/2025	2346.9	3112.2	0.70	0.50	15,246	10,890	26,136	18.2
4/8/2025	2347.3	3112.6	0.40	0.40	8,712	8,712	17,424	12.1
4/9/2025	2347.8	3113.1	0.50	0.50	10,890	10,890	21,780	15.1
4/10/2025	2348.3	3113.6	0.50	0.50	10,890	10,890	21,780	15.1
4/11/2025	2348.7	3114.0	0.40	0.40	8,712	8,712	17,424	12.1
4/12/2025								
4/13/2025								
4/14/2025	2350.1	3115.4	0.47	0.47	10,164	10,164	20,328	14.1
4/15/2025	2350.6	3115.9	0.50	0.50	10,890	10,890	21,780	15.1
4/16/2025	2351.0	3116.3	0.40	0.40	8,712	8,712	17,424	12.1
4/17/2025	2351.4	3116.7	0.40	0.40	8,712	8,712	17,424	12.1
4/18/2025	2351.8	3117.1	0.40	0.40	8,712	8,712	17,424	12.1
4/19/2025								
4/20/2025								
4/21/2025	2353.0	3118.3	0.40	0.40	8,712	8,712	17,424	12.1
4/22/2025	2353.4	3118.7	0.40	0.40	8,712	8,712	17,424	12.1
4/23/2025	2353.8	3119.2	0.40	0.50	8,712	10,890	19,602	13.6
4/24/2025	2354.2	3119.6	0.40	0.40	8,712	8,712	17,424	12.1
4/25/2025	2354.6	3119.9	0.40	0.30	8,712	6,534	15,246	10.6
4/26/2025								
4/27/2025								
4/28/2025	2355.9	3121.3	0.43	0.47	9,438	10,164	19,602	13.6
4/29/2025	2356.3	3121.6	0.40	0.30	8,712	6,534	15,246	10.6
4/30/2025								
5/1/2025								
5/2/2025	2357.6	3122.9	0.43	0.43	9,438	9,438	18,876	13.1
5/3/2025								
5/4/2025								
5/5/2025	2358.7	3124.1	0.37	0.40	7,986	8,712	16,698	11.6
5/6/2025	2359.2	3124.6	0.50	0.50	10,890	10,890	21,780	15.1
5/7/2025	2359.7	3125.0	0.50	0.40	10,890	8,712	19,602	13.6
5/8/2025	2360.1	3125.5	0.40	0.50	8,712	10,890	19,602	13.6
5/9/2025	2360.6	3125.9	0.50	0.40	10,890	8,712	19,602	13.6
5/10/2025								
5/11/2025								
5/12/2025	2361.7	3127.0	0.37	0.37	7,986	7,986	15,972	11.1
5/13/2025	2362.1	3127.4	0.40	0.40	8,712	8,712	17,424	12.1
5/14/2025	2362.3	3127.8	0.20	0.40	4,356	8,712	13,068	9.1
5/15/2025	2362.7	3128.1	0.40	0.30	8,712	6,534	15,246	10.6
5/16/2025	2363.0	3128.4	0.30	0.30	6,534	6,534	13,068	9.1
5/17/2025								
5/18/2025								
5/19/2025	2364.4	3129.7	0.47	0.43	10,164	9,438	19,602	13.6

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Date	LS #1 Pump Run Time (hrs)	LS #2 Pump Run Time (hrs)	LS #1 Hrs/day	LS #2 Hrs/day	LS #1 gpd	LS #2 gpd	Total gpd	Total gpm
5/20/2025	2364.7	3130.2	0.30	0.50	6,534	10,890	17,424	12.1
5/21/2025	2365.1	3130.5	0.40	0.30	8,712	6,534	15,246	10.6
5/22/2025	2365.5	3130.9	0.40	0.40	8,712	8,712	17,424	12.1
5/23/2025	2365.8	3131.2	0.30	0.30	6,534	6,534	13,068	9.1
5/24/2025								
5/25/2025								
5/26/2025								
5/27/2025	2367.6	3132.9	0.45	0.43	9,801	9,257	19,058	13.2
5/28/2025	2368.1	3133.4	0.50	0.50	10,890	10,890	21,780	15.1
5/29/2025	2368.6	3133.8	0.50	0.40	10,890	8,712	19,602	13.6
5/30/2025	2369.1	3134.2	0.50	0.40	10,890	8,712	19,602	13.6
12/1/2025	2509.4	3274.4	0.76	0.76	16,517	16,506	33,023	22.9
12/2/2025	2509.9	3275.6	0.50	1.20	10,890	26,136	37,026	25.7
12/3/2025	2510.8	3276.0	0.90	0.40	19,602	8,712	28,314	19.7
12/4/2025	2511.0	3276.8	0.20	0.80	4,356	17,424	21,780	15.1
12/5/2025	2513.1	3278.1	2.10	1.30	45,738	28,314	74,052	51.4
12/6/2025								
12/7/2025								
12/8/2025	2515.9	3280.8	0.93	0.90	20,328	19,602	39,930	27.7
12/9/2025	2516.9	3281.8	1.00	1.00	21,780	21,780	43,560	30.3
12/10/2025	2517.9	3282.8	1.00	1.00	21,780	21,780	43,560	30.3
12/11/2025	2518.4	3283.4	0.50	0.60	10,890	13,068	23,958	16.6
12/12/2025	2519.5	3284.2	1.10	0.80	23,958	17,424	41,382	28.7
12/13/2025	2520.0	3285.0	0.50	0.80	10,890	17,424	28,314	19.7
12/14/2025								
12/15/2025								
12/16/2025								
12/17/2025	2523.4	3288.4	0.85	0.85	18,513	18,513	37,026	25.7
12/18/2025	2524.2	3289.1	0.80	0.70	17,424	15,246	32,670	22.7
12/19/2025	2524.9	3289.9	0.70	0.80	15,246	17,424	32,670	22.7
12/20/2025	2525.8	3290.8	0.90	0.90	19,602	19,602	39,204	27.2
12/21/2025								
12/22/2025	2527.7	3292.7	0.95	0.95	20,691	20,691	41,382	28.7
12/23/2025	2529.9	3293.9	2.20	1.20	47,916	26,136	74,052	51.4
12/24/2025								
12/25/2025								
12/26/2025								
12/27/2025								
12/28/2025	2532.4	3297.4	0.50	0.70	10,890	15,246	26,136	18.2
12/29/2025	2534.2	3299.2	1.80	1.80	39,204	39,204	78,408	54.4
12/30/2025	2535.3	3300.3	1.10	1.10	23,958	23,958	47,916	33.3
12/31/2025	2536.6	3301.6	1.30	1.30	28,314	28,314	56,628	39.3

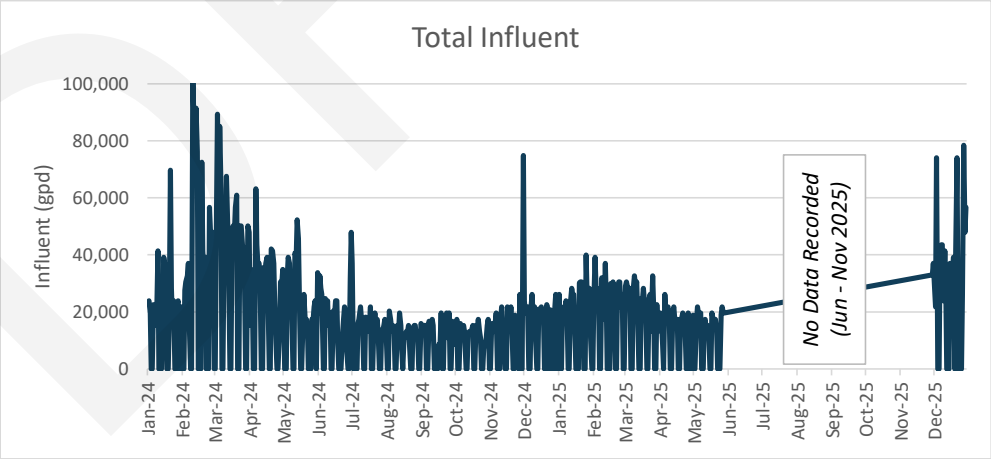
DRAFT

2024	Total Hrs	Date Start	Date End	Total Gal	MG/Year	gpd	ADD (gpm)
LS #1 =	153.4	1/3/2024	12/16/2024	3,341,052	3.3	9,601	6.7
LS #2 =	284.2	1/3/2024	12/31/2024	6,189,876	6.2	17,052	11.8
			SUM =	9,530,928	9.5	26,653	18.5

2025	Total Hrs	Date Start	Date End	Total Gal	MG/Year	gpd	ADD (gpm)
LS #1 =	247.6	1/2/2025	12/31/2025	5,392,728	5.4	14,856	10.3
LS #2 =	247.1	1/2/2025	12/31/2025	5,381,838	5.4	14,826	10.3
			SUM =	10,774,566	10.8	29,682	20.6

Average Flows (gal/day)		
	2024	2025
Jan	27,407	24,850
Feb	49,492	27,492
Mar	52,756	26,032
Apr	33,924	18,100
May	27,753	17,687
Jun	20,491	-
Jul	19,627	-
Aug	13,944	-
Sep	15,170	-
Oct	12,910	-
Nov	16,851	-
Dec	23,076	41,952

Maximum Flows (gal/day)		
	2024	2025
Jan	69,696	39,930
Feb	103,092	39,204
Mar	89,298	32,670
Apr	63,162	26,136
May	52,272	21,780
Jun	33,759	-
Jul	47,916	-
Aug	20,328	-
Sep	19,602	-
Oct	17,424	-
Nov	26,136	-
Dec	74,778	78,408
Max =	103,092	78,408



DRAFT

Pump Info:

Drawdown Tests done by Cole & David:			
Day of Week =	Thursday	Monday	
Rise =	13	8	in
Time =	22	15.35	min
Wet Well Dia =	96	96	in
Total Gal =	407.4	250.7	gal
Average Gal=	18.5	16.3	gpm
Average =	**17.4**		**gpm**

Source: Annual Report for Sewer Lagoon, Wastewater Lift Station dated 9/24/2025

Pump #1 (Test 1):			**Pump #1 (Test 2):**		
Rise =	12	in	Rise =	12	in
Time =	1.02	min	Time =	0.95	min
Wet Well Dia =	96	in	Wet Well Dia =	96	in
Total Gal =	376.0	gal	Total Gal =	376.0	gal
Average Gal=	369.9	gpm	Average Gal=	395.8	gpm
Influent* =	17.4	gpm	Influent* =	17.4	gpm
Pump #1 Flow =	**352.4**	**gpm**	**Pump #1 Flow =**	**378.4**	**gpm**
Average Pump #1 Flow =			**365.4**	gpm	

Pump #2 (Test 1):			**Pump #2 (Test 2):**		
Rise =	12	in	Rise =	12	in
Time =	0.93	min	Time =	1.13	min
Wet Well Dia =	96	in	Wet Well Dia =	96	in
Total Gal =	376.0	gal	Total Gal =	376.0	gal
Average Gal=	402.9	gpm	Average Gal=	331.8	gpm
Influent* =	17.4	gpm	Influent* =	17.4	gpm
Pump #2 Flow =	**385.5**	**gpm**	**Pump #2 Flow =**	**314.4**	**gpm**
Average Pump #2 Flow =			**349.9**	gpm	

Pump Curve:		
Design Flow =	363.3	gpm
~	363.0	gpm
Design Head =	32.66	ft

Conclusion: Use 363 gpm for both pumps. This represents the design flow from the pump curve. Based on pump tests, the pumps are running in this range.

DRAFT

Infiltration & Inflow

Project: City of Tetonia WWFPS
Project Number: 16084
Last Revised on: 2/9/2026
Created By: Laura Radke, PE

Assumption: Flow in Winter months is high due to faucets being left on to prevent pipe freezing.

Color Legend:
Temp < 32 Deg

Average Max & Min Temperatures (°F)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	24	26	31	41	65	67	81	75	69	53	42	33
	7	5	12	19	38	41	48	47	41	30	22	14
2024	30	35	38	50	56	74	81	78	72	62	36	34
	14	17	17	27	30	44	48	46	42	32	18	18
2025	22	32	41	53	63	73	81	79	71	53	47	38
	2	14	21	26	36	42	48	48	40	30	26	22

Source: Western Regional Climate Center (Tetonia Experiment Stn, ID - 109065)

Max Flow Dates (in 2024 & 2025)				
Date	Daily Flow (gpm)	Precipication (in)	Max Temp (°F)	Min Temp (°F)
2/12/2024	71.6	0	27	17
2/15/2024	63.5	0.32	34	24
3/5/2024	62.0	0.12	23	6
3/7/2024	59.0	0.03	33	20
2/13/2024	57.5	0	28	19
2/14/2024	56.0	0.24	31	23
12/29/2025	54.4	0	17	-3
2/16/2024	52.9	0.55	35	24
12/2/2024	51.9	0	32	13
12/23/2025	51.4	0.05	44	33

Source: National Centers for Environmental Information (NOAA) - Climate Data Online Search (Station: Tetonia Experiment Station)

Max Flow Dates (in 2022 & 2023)				
Date	Daily gpm	Precipication (in)	Max Temp (°F)	Min Temp (°F)
4/11/2023	28.3	0	52	29
4/13/2023	28.1	0.32	51	27
12/26/2022	26.7	0	29	24
1/31/2023	26.2	0	-5	-21
3/14/2023	25.6	0	43	27
3/29/2023	25.5	0	33	12
3/28/2023	25.2	0	26	8
3/15/2023	25.2	0.1	43	32
4/10/2023	24.4	0	46	27
5/25/2023	24.4	0.09	58	39

Source: National Centers for Environmental Information (NOAA) - Climate Data Online Search (Station: Tetonia Experiment Station)

Flow	Year	Dry Weather Flow (gpm)	Wet Weather Flow (gpm)	Difference b/w Dry & Wet Weather Flows		Wet Weather (gpcd)
				Flow	%	
ADF	2023	16	17	2	10%	60
	2024	12	27	14	54%	90
	2025	12	24	12	49%	79

Conclusion: Wet Weather Flows are less than 100 gpcd, therefore no significant I&I Concerns. Temperatures below freezing for most of the winter months indicate users are leaving faucets running to prevent freezing of pipelines. This explains the high flows observed in the winter months.

DRAFT

Gravity Pipe Flow Capacity

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	3/6/2026
Created By:	Laura Radke, PE

Legend:
- Linked Cell
- Calculation

Pipe Capacity at minimum Slope:

50% Pipe Flow Capacity:

n =	0.013	Concrete			
=	0.011	(PVC Pipe)			
D =	8	in			
=	0.67	ft			
d =	4.00	in			
=	0.33	ft			
S =	0.40%				
R =	A/P				

From Appendix 16.A from PE Civil Reference Manual:

d/D =	0.5				
area/D^2 =	0.3927	->	area =	0.174533333	ft^2
wetted P/D=	1.5708	->	vetted P =	1.0472	ft
R =	0.1666667				

Concrete:			PVC:		
$Q_{50\%}$ =	**0.38**	cfs	$Q_{50\%}$ =	**0.45**	cfs

70% Pipe Flow Capacity:

n =	0.013	Concrete			
=	0.011	(PVC Pipe)			
D =	8	in			
=	0.67	ft			
d =	5.60	in			
=	0.47	ft			
S =	0.40%				
R =	A/P				

From Appendix 16.A from PE Civil Reference Manual:

d/D =	0.7				
area/D^2 =	0.5872	->	area =	0.26098	ft^2
wetted P/D=	1.9823	->	wetted P =	1.32153	ft
R =	0.19748				

Concrete:			PVC:		
$Q_{70\%}$ =	**0.64**	cfs	$Q_{70\%}$ =	**0.76**	cfs

Trunkline Pipe Capacity Calculations:

Design Flows

Current PHF =	82	gpm	=	0.18 cfs
Future PHF (2045) =	193	gpm	=	0.43 cfs
Future PHF (2065) =	349	gpm	=	0.78 cfs

Mannings Equation:

$$Q = \frac{1.486}{n} A R^{2/3} S^{0.5}$$

Full Pipe Flow Capacity:

n =	0.013	Concrete
=	0.011	(PVC Pipe)
D =	8	in
=	0.67	ft
A =	0.35	ft^2
S =	0.55%	
R =	A/P	
$P = \pi D$		
=	2.1	
R =	0.2	

Q_{full} =	**0.90**	cfs (Concrete)
Q_{full} =	**1.06**	cfs (PVC)

Pipe Capacity:

d/D	< 50%	Good Capacity
d/D	50% - 70%	Fair Capacity
d/D	> 70%	Out of Capacity

Where,
- d = depth of flow
- D = Pipe Diameter (Full Pipe)

Current PHF:		Future PHF (2045):		Future PHF (2065):	
q =	0.18 cfs	q =	0.43 cfs	q =	0.78 cfs
Q =	0.90 cfs	Q =	0.90 cfs	Q =	1.06 cfs
q/Q =	0.20	q/Q =	0.48	q/Q =	0.73

Find d/D using "Hydraulic Elements Graph for Circular Pipe" from the PE Civil Reference Handbook (Version 1.2):

d/D =	0.36	d/D =	0.56	d/D =	0.81
From d/D, find d:					
D =	8.00 in	D =	8.00 in	D =	8.00 in
d =	2.88 in	d =	4.48 in	d =	6.48 in

Max Capacity:

d/D =	0.70
find q/Q using Graph:	
q/Q =	0.72

Find q using Q for full pipe flow and q/Q from chart:

Q =	0.90 cfs
q =	**0.65 cfs**
	290 gpm
1 ERU =	0.41 gpm at Peak Hour
# of Total ERUs =	**707**

DRAFT

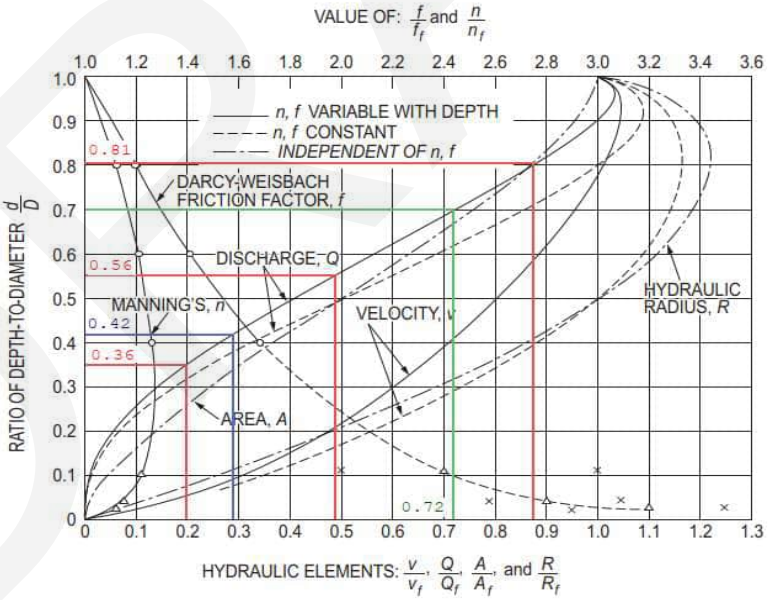
Gravity Pipe Flow Capacity

Future Full Pipe Flow Capacity:		
n =	0.013	Concrete
=	0.011	(PVC Pipe)
D =	12	in
=	1.00	ft
A =	0.79	ft^2
S =	0.55%	
R =	A/P	
$P = \pi D$		
=	3.1	
R =	0.3	
Q_{full} =	**2.64**	cfs (Concrete)
Q_{full} =	**3.12**	cfs (PVC)

Future PHF (2065) with 12" Dia. Pipe:		
q =	0.78	cfs
Q =	2.64	cfs
q/Q =	0.29	
Find d/D using graph:		
d/D =	0.42	
From d/D, find d:		
D =	8.00	in
d =	3.36	in

6.4.5.3 Flow in Circular Pipe

Hydraulic Elements Graph for Circular Pipe (Partial Flow Diagram)



Source: American Society of Civil Engineers. *Design and Construction of Sanitary and Storm Sewers*. Reston, VA: ASCE, 1970, pg. 87, fig. 24.

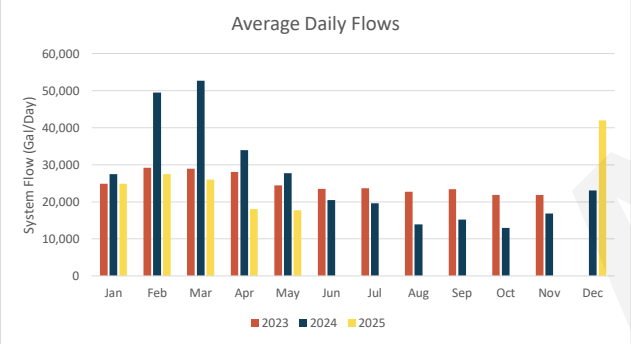
DRAFT

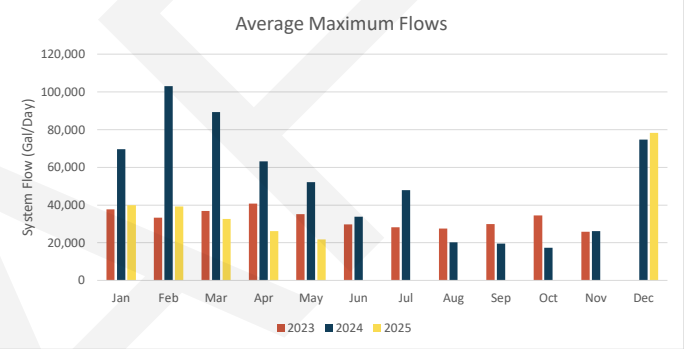
WASTEWATER FLOW CALCULATIONS - USING DAILY LIFT STATION PUMP HOUR RECORDINGS

Project: City of Tetonia WWFPS
Project Number: 16084
Last Revised on: 2/9/2026
Created By: Laura Radke, PE

Average Flows (gal/day)				
	2022	2023	2024	2025
Jan	-	24,935	27,407	24,850
Feb	-	29,204	49,492	27,492
Mar	-	28,915	52,756	26,032
Apr	-	28,102	33,924	18,100
May	-	24,442	27,753	17,687
Jun	-	23,522	20,491	-
Jul	-	23,665	19,627	-
Aug	-	22,699	13,944	-
Sep	20,894	23,401	15,170	-
Oct	21,711	21,804	12,910	-
Nov	25,223	21,883	16,851	-
Dec	28,459	-	23,076	41,952

Maximum Flows (gal/day)				
	2022	2023	2024	2025
Jan	-	37,762	69,696	39,930
Feb	-	33,315	103,092	39,204
Mar	-	36,792	89,298	32,670
Apr	-	40,745	63,162	26,136
May	-	35,122	52,272	21,780
Jun	-	29,660	33,759	-
Jul	-	28,201	47,916	-
Aug	-	27,615	20,328	-
Sep	25,184	29,869	19,602	-
Oct	25,835	34,482	17,424	-
Nov	32,384	25,883	26,136	-
Dec	38,471	-	74,778	78,408
MAX =	**38,471**	**40,745**	**103,092**	**78,408**





Annual Recorded Flow Data		
Year	2022	2023
Total Flow (MG)	2.8	8.2
# Days	113	329
ADD (gpd)	24,527	24,856
ADD (gpm)	**17.0**	**17.3**

2024							
	Total Hrs	Date Start	Date End	Total Gal	MG/Year	gpd	ADD (gpm)
LS #1 =	153.4	1/3/2024	12/16/2024	3,341,052	3.3	9,601	6.7
LS #2 =	284.2	1/3/2024	12/31/2024	6,189,876	6.2	17,052	11.8
			SUM =	**9,530,928**	**9.5**	**26,653**	**18.5**

2025							
	Total Hrs	Date Start	Date End	Total Gal	MG/Year	gpd	ADD (gpm)
LS #1 =	247.6	1/2/2025	12/31/2025	5,392,728	5.4	14,856	10.3
LS #2 =	247.1	1/2/2025	12/31/2025	5,381,838	5.4	14,826	10.3
			SUM =	**10,774,566**	**10.8**	**29,682**	**20.6**

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WASTEWATER FLOW CALCULATIONS - USING DAILY LIFT STATION PUMP HOUR RECORDINGS

Historic Sytem Flows

Year	2023	2024	2025	Design Criteria			
Estimated Population	421	427	442	Maximum	Peaking Factor	gpm/ERU[4]	gpd/ERU[4]
Total MG	8.2	9.5	10.8	10.8	-	-	-
ADF (gpm)	17	19	21	21	1.0	0.10	148
Dry Weather ADF[1] (gpm)	16	12	12	16	0.8	0.08	113
Wet Weather ADF[2] (gpm)	17	27	24	27	1.3	0.13	191
MMADF (gpm)	20	37	29	37	1.8	0.18	262
MDF (gpm)	28	72	54	72	3.5	0.36	512
PHF[3] (gpm)	69	74	82	82	4.0	0.41	590

NOTES:
[1]Dry Weather Flow = ADF of dry months - see Precipitation Table.
[2]Wet Weather Flow = ADF of wet months - see Precipitation Table.
[3]Peaking Factor for PHF = 4
(Based on Metcalf & Eddy 'Figure 3-13' on page 202)
[4] # of Residential ERUs = 140
[4] # of Commercial ERUs = 61
[4] # of Totall ERUs = 201

ADD per person = 67 gpcd

Total Precipitation (inches)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	2.51	2.46	3.45	1.17	1.54	4.35	0.33	2.81	2.18	3.21	0.59	1.73
	Wet	Wet	Wet			Wet	Dry	Wet		Wet	Dry	
2024	2.63	3.19	1.72	1.32	1.69	0.7	0.45	2.06	1.56	0.31	1.51	2.15
	Wet	Wet				Dry	Dry			Dry		
2025	1.21	2.88	1.32	1.63	1.18	0.24	0.26	1.41	1.47	3.67	0.46	3.16
		Wet			Dry*	Dry	Dry			Wet	Dry	Wet

Source: Western Regional Climate Center (Tetonia Experiment Stn, ID - 109065)

Scale:
0 to 1 Dry
1 to 2.5 Disregard
> 2.5 Wet
* Add due to minimal data available

DRAFT

WASTEWATER FLOW CALCULATIONS - USING DAILY LIFT STATION PUMP HOUR RECORDINGS

Design Criteria

CURRENT (2025) SYSTEM FLOWS							
Flow Per ERU							
Average Daily	0.10	gpm	148	gpd			
Max Month ADF	0.18	gpm	262	gpd	x	1.8	of Average
Max Daily	0.36	gpm	512	gpd	x	3.5	of Average
Peak Hour	0.41	gpm	590	gpd	x	4.0	of Average
Total Equivalent Residential Users (ERUs)					**201**		
System Flow							
Average Daily	21	gpm	29,682	gpd			
Max Month ADF	37	gpm	52,756	gpd	x	1.8	of Average
Max Daily	72	gpm	103,092	gpd	x	3.5	of Average
Peak Hour	82	gpm	118,728	gpd	x	4.0	of Average

FUTURE (2045) DESIGN FLOWS							
Flow Per ERU							
Average Daily	0.10	gpm	148	gpd			
Max Month ADF	0.18	gpm	262	gpd	x	1.8	of Average
Max Daily	0.36	gpm	512	gpd	x	3.5	of Average
Peak Hour	0.41	gpm	590	gpd	x	4.0	of Average
Total Equivalent Residential Users (ERUs)					**471**		
System Flow							
Average Daily	48	gpm	69,534	gpd			
Max Month ADF	86	gpm	123,589	gpd	x	1.8	of Average
Max Daily	168	gpm	241,508	gpd	x	3.5	of Average
Peak Hour	193	gpm	278,138	gpd	x	4.0	of Average

FUTURE (2065) DESIGN FLOWS							
Flow Per ERU							
Average Daily	0.10	gpm	148	gpd			
Max Month ADF	0.18	gpm	262	gpd	x	1.8	
Max Daily	0.36	gpm	512	gpd	x	3.5	of Average
Peak Hour	0.41	gpm	590	gpd	x	4.0	of Average
Total Equivalent Residential Users (ERUs)					**851**		
System Flow							
Average Daily	87	gpm	125,587	gpd			
Max Month ADF	155	gpm	223,215	gpd	x	1.8	of Average
Max Daily	303	gpm	436,191	gpd	x	3.5	of Average
Peak Hour	349	gpm	502,348	gpd	x	4.0	of Average

DRAFT

Treatment Capacity - BOD & NOD Loading

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	5/11/2026
Created By:	Laura Radke, PE
Checked By:	David Assan, PhD, PE

Input Data:

Lagoon Treatment Cell:

Cell #1 Area = 1.75 ac

Lab Results from 3/4/2026:

	Influent	Effluent	
BOD =	194	116	mg/L
Ammonia as N =	43.92	33.29	mg/L

Flow Data:

	gpm	MGD
Current ADF =	21	0.030
2045 ADF =	48	0.070
2065 ADF =	87	0.126

ADF per ERU = 0.10 gpm
= 148 gpd

Number of ERUs:

Current = 201
Future (2045) = 471
Future (2065) = 851

Newterra Aerators:

# of Aerators in Cell 1 =	2	
Electric Motor =	5	hp
Oxygen Transfer =	1.8	lbs of O_2/hp*hr
Oxygen Transfer per Aerator =	9.0	lbs of O_2/hr
Total Oxygen Transfer =	18	lbs of O_2/hr

Legend:

- Input
- Linked Cell
- Calculation
- Answer (Good)
- Answer (Bad)

Conversion of 'Ammonia as N' to TKN:

Multiplication Factor* =	1.56	
Influent TKN =	69	mg/L
Effluent TKN =	52	mg/L

*Ammonia as N is typically 64% of TKN. Therefore, multiply by 1.56 to convert to TKN (1 / 0.64 = 1.56)

Current (2025) BOD & NOD Loading:

BOD Loading = Q (MGD) * BOD (mg/L) *8.34
= 0.030 MGD * 194 mg/L * 8.34
= 48.0 lb BOD/day

NOD Loading = Q (MGD) * TKN (mg/L) *8.34
= 0.030 MGD * 69 mg/L * 8.34
= 17.0 lb TKN/day

Note: 8.34 is a conversion factor to convert to lb of BOD/day as shown below:

$$Conversion\ Factor = \frac{1{,}000{,}000\ gal}{1\ MG} * \frac{3.785\ L}{1\ gal} * \frac{1\ lb}{453{,}592\ mg} = \frac{3{,}785{,}000}{453{,}592} = 8.34\ \frac{lb}{MG * mg/L}$$

Future (2045) BOD & NOD Loading:

BOD Loading = Q (MGD) * BOD (mg/L) *8.34
= 0.070 MGD * 194 mg/L * 8.34
= 112.5 lb BOD/day

NOD Loading = Q (MGD) * TKN (mg/L) *8.34
= 0.070 MGD * 69 mg/L * 8.34
= 39.8 lb TKN/day

DRAFT

SUNRISE ENGINEERING

Treatment Capacity - BOD & NOD Loading

Future (2065) BOD & NOD Loading:

BOD Loading = Q (MGD) * BOD (mg/L) *8.34

= 0.126 MGD * 194 mg/L * 8.34

= **203.2** lb BOD/day

NOD Loading = Q (MGD) * TKN (mg/L) *8.34

= 0.126 MGD * 43.92 mg/L * 8.34

= **46.0** lb TKN/day

Oxygen Supply vs Demand:

Oxygen Supply:

Oxygen Transfer per Aerator = 9.0 lbs of O_2/hr = **216** lbs of O_2/day

Total System Oxygen Transfer* = **18** lbs of O_2/hr = **432** lbs of O_2/day

*Based on 2 aerators

Oxygen Demand:

For aerated lagoons: $O_2 = (1.5 * Influent\ BOD\ Loading) + (4.6 * Influent\ NOD\ Loading)$

Equation Per 10 State Standards Section 92.331

			BOD Loading				NOD Loading			
Current (2025) O_2 Demand =	1.5	*	48.0 lb/day	+	4.6	*	17.0 lb/day	=	**150**	lb O_2/day
Future (2045) O_2 Demand =	1.5	*	112.5 lb/day	+	4.6	*	39.8 lb/day	=	**352**	lb O_2/day
Future (2065) O_2 Demand =	1.5	*	203.2 lb/day	+	4.6	*	46.0 lb/day	=	**516**	lb O_2/day

Supply vs Demand:

	O_2 Demand (lb O_2/day)		O_2 Supply - 1 Aerator* (lb O_2/day)		Total # of Aerators Req.		Suffient until # of ERUs reaches
Current (2025) =	150	<	216	OK	2	->	289
Future (2045) =	352	>	216	Not Good	3	->	579
Future (2065) =	516	>	216	Not Good	4	->	1,135

**Only 1 Aertaor is considered in this supply vs demand comparison because there must be 1 redundant aerator.*

Future Aerators

Current # of Aerators Sufficient Until:

$$O_2\ Demand \leq O_2\ Supply$$

Total # of Aerators = 2

Total - 1 Redundant = 1

O_2 Transfer/ Aerator = 216 lbs of O_2/day

O_2 Supply = 216 lb O_2/day

Flow per ERU = 148 gpd/ERU

# of ERUs* = 289 *Use 'Goal Seek' to find flow at which # of ERUs the O_2 Demand equals 216 lb O_2/day.

BOD Loading = Q (MGD) * BOD (mg/L) *8.34

= **0.043** MGD * 194 mg/L * 8.34

= **69.1** lb BOD/day

NOD Loading = Q (MGD) * TKN (mg/L) *8.34

= **0.043** MGD * 69 mg/L * 8.34

= **24.4** lb TKN/day

O_2 Demand = $O_2 = (1.5 * Influent\ BOD\ Loading) + (4.6 * Influent\ NOD\ Loading)$

= **216.0** lb O_2/day

O_2 Demand	≤	**O_2 Supply**
216	=	216

Therefore, when the number of ERUs exceeds 289, an additional aerator will be needed.

DRAFT

Treatment Capacity - BOD & NOD Loading

1st Additional Aerator Sufficient Until:

$$O_2\ Demand \leq O_2\ Supply$$

Total # of Aerators = **3**
Total - 1 Redundant = 2
O_2 Transfer/ Aerator = 216 lbs of O_2/day
O_2 Supply = 432 lb O_2/day

Flow per ERU = 148 gpd/ERU
# of ERUs* = 579 *Use 'Goal Seek' to find flow at which # of ERUs the O_2 Demand equals 432 lb O_2/day.

BOD Loading = Q (MGD) * BOD (mg/L) *8.34
= 0.085 MGD * 194 mg/L * 8.34
= 138.1 lb BOD/day

NOD Loading = Q (MGD) * TKN (mg/L) *8.34
= 0.085 MGD * 69 mg/L * 8.34
= 48.9 lb TKN/day

O_2 Demand = $O_2 = (1.5 * Influent\ BOD\ Loading) + (4.6 * Influent\ NOD\ Loading)$
= 432.0 lb O_2/day

O_2 Demand	≤	O_2 Supply
432	=	432

Therefore, one additional aerator will be sufficient until the number of ERUs exceeds 579.

2nd Additional Aerator Sufficient Until:

$$O_2\ Demand \leq O_2\ Supply$$

Total # of Aerators = **4**
Total - 1 Redundant = 3
O_2 Transfer/ Aerator = 216 lbs of O_2/day
O_2 Supply = 648 lb O_2/day

Flow per ERU = 148 gpd/ERU
# of ERUs* = 1,135 *Use 'Goal Seek' to find flow at which # of ERUs the O_2 Demand equals 648 lb O_2/day.

BOD Loading = Q (MGD) * BOD (mg/L) *8.34
= 0.167 MGD * 194 mg/L * 8.34
= 270.9 lb BOD/day

NOD Loading = Q (MGD) * TKN (mg/L) *8.34
= 0.167 MGD * 69 mg/L * 8.34
= 95.8 lb TKN/day

O_2 Demand = $O_2 = (1.5 * Influent\ BOD\ Loading) + (4.6 * Influent\ NOD\ Loading)$
= 648.0 lb O_2/day

O_2 Demand	≤	O_2 Supply
648	=	648

Therefore, two additional aerators will be sufficient until the number of ERUs exceeds 1,135.

DRAFT

SUNRISE ENGINEERING

Lift Station Wet Well Sizing

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	5/11/2026
Created By:	Laura Radke, PE
Checked By:	David Assan, PhD, PE

Legend:

Input
Linked Cell
Calculation
Answer (Good)
Answer (Bad)

Input Data:

Flow Data:

	gpm	MGD
Current ADF =	21	0.030
2045 ADF =	48	0.070
2065 ADF =	87	0.126

Current PHF =	82	gpm
2045 PHF =	193	gpm
2065 PHF =	349	gpm

ADF per ERU = 0.10 gpm
= 148 gpd

Number of ERUs:

Current =	201
Future (2045) =	471
Future (2065) =	851

Lift Station Data:

Inside LS Dia =	96	in
Wet Well Depth =	194	in
Inlet Pipe Dia =	8	in
Outlet Pipe Dia =	4	in

Rim Elev =	6030.0	ft
Bottom of Wet Well =	6014.0	ft
Inlet Invert =	6021.2	ft

Lead Pump On =	6.0	ft
Lag Pump On =	6.9	ft
Pumps Off =	2.1	ft
High Water On =	7.0	ft

Existing Wetwell Volume Conversion*:

V (Lead On) =	1,817	gal
V (Lag Pump On) =	2,156	gal
V (Pumps Off) =	351	gal
V (HWL) =	2,194	gal

*Based on 8' diameter wet well as shown in the record drawings. This excludes the 1'-2" of dead storage at the bottom.

Wet Well Sizing Check:

Wet Well Design:

Filling Time* = 30 min

*Per 10-State Standards Section 42.62 on page 40-5.

			Volume Required* (Gal)		Volume Provided** (Gal)	
Current ADF =	21	gpm	618	<	1,817	OK
2045 ADF =	48	gpm	1,449	<	1,817	OK
2065 ADF =	87	gpm	2,616	>	1,817	Not Good

*Based on 30 min fill time of ADF

**Based on Volume at which lead pump turns on.

Maximum Wet Well Capacity:

Wet Well Volume =	1,817	gal
ADF per ERU =	0.10	gpm
Max # of ERUs =	591	
Max System ADF* =	1,817	gal

*Use "Goal Seek" Function to determine at which # of ERUs the System ADF = Max Volume of Wet Well

DRAFT

Flow Capacity - Number of Cells Required

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	5/11/2026
Created By:	Laura Radke, PE

Legend:

Input
Linked Cell
Calculation
Answer (Good)
Answer (Bad)

IDAPA 58.01.16.493.08.a

08. Number of Cells Required. (3-31-22)

a. A wastewater treatment pond system shall consist of a minimum of three (3) cells designed to facilitate both series and parallel operations. Two (2) cell systems may be utilized in very small installations of less than fifty thousand (50,000) gallons per day. (3-31-22)

b. All systems shall be designed with piping flexibility to permit isolation of any cell without affecting the transfer and discharge capabilities of the total system. (3-31-22)

Section 493 **Page 53**

Minimum # Cells Required =	*2*	*for systems*	<	*50,000*	*gpd*
Minimum # Cells Required =	*3*	*for systems*	≥	*50,000*	*gpd*

Design Criteria:

Referenced Data from 'Tetonia WW Flow Calculations' Spreadsheet:

Current (2025) ADF =	21	gpm	=	*29,682*	*gpd*	<	50,000	*gpd*
Future (2045) ADF =	48	gpm	=	*69,534*	*gpd*	>	50,000	*gpd*
Future (2065) ADF =	87	gpm	=	*125,587*	*gpd*	>	50,000	*gpd*

Third Lagoon Cell Requirement:

ADF per ERU = 0.10 gpm

= **148** gpd

New Cell Required when: $System\ ADF = 50{,}000\ gpd$

# of ERUs* = 339 *Use 'Goal Seek' to find at which # of ERUs the System ADF equals 50,000 gpd.

System ADF = **50,000** = *50,000 gpd*

Therefore, a third lagoon cell will be required when the total number of ERUs reached 339.

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Hydraulic Detention Time (t) of Treatment Lagoon

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	2/24/2026
Created By:	Laura Radke, PE

Hydraulic Detention Time (t):

$$t = \frac{E}{2.3k_1 * (100 - E)}$$

t = hydraulic detention time, days
E = percent of BOD_5 to be removed in aerated cell
k_1 = reaction coefficient, aerated pond, base 10. For normal domestic wastewater, the k_1 value may be assumed to be 0.12/day at 68°F (20°C) and 0.06/day at 34°F (1°C).

Source: 10-State Standards

Legend:

Input
Linked Cell
Calculation
Answer (Good)
Answer (Bad)

Design Criteria

Current (2025) ADD =	21	gpm
Future (2045) ADD =	48	gpm
Future (2065) ADD =	87	gpm

Referenced Data from 'Tetonia WW Flow Calculations' Spreadsheet:

Required Hydraulic Detention Time, $t_{85\%}$

Treatment		
E =	85	%
k_1 =	0.06	per day
$t_{85\%}$ =	41	days

Hydraulic Detention Time

$$HDT = \frac{V}{Q}$$

HDT = Hydraulic Detention Time (days)
V = Lagoon Volume (gal)
Q = Inflow Rate (gal/day)

Current Detention Time (2025)

Volume (Cell 1) = 5.135 MG
Flow = 21 gpm
29,682 gpd
Detention Time = Lagoon Volume / Flow
= 5,135,000 / 29,682
= **173.0005 days** > 41 days

Future Detention Time (2045)

Volume (Cell 1) = 5.135 MG
Flow = 48 gpm
69,534 gpd
Detention Time = Lagoon Volume / Flow
= 5,135,000 / 69,534
= **74 days** > 41 days

Future Detention Time (2065)

Volume (Cell 1) = 5.135 MG
Flow = 87.2 gpm
125,587 gpd
Detention Time = Lagoon Volume / Flow
= 5,135,000 / 125,587
= **40.9 days** < 41 days

Maximum Capacity

Volume (Cell 1) = 5.135 MG
Flow = **87.0 gpm**
125,244 gpd
Detention Time = Lagoon Volume / Flow*
= 5,135,000 / 125,244
= 41 days = 41 days

*Use 'Goal Seek' to find Flow at which Detention Time equals 41 days.

= **849** **ERUs**

DRAFT

Capacity of Winter Storage Lagoon

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	2/24/2026
Created By:	Laura Radke, PE

Legend:

Input
Linked Cell
Calculation
Answer (Good)
Answer (Bad)

Required Storage Time for Winter Lagoon (Cell #2)

(Non-growing Season per Reuse Permit)

Start of Nongrowing Season = 1-Nov

End of Nongrowing Season = 31-Mar

Winter T = **151** days

Storage/Retention Time

$$T = \frac{V}{Q}$$

T = Storage/Retention Time (days)

V = Lagoon Volume (gal)

Q = Inflow Rate (gal/day)

Design Criteria

Current (2025) ADD =	21	gpm	**29,682**	gpd
Future (2045) ADD =	48	gpm	**69,534**	gpd
Future (2065) ADD =	87	gpm	**125,587**	gpd

Referenced Data from 'Tetonia WW Flow Calculations' Spreadsheet:

Current (2025) Storage Time

$V_{cell\ \#2}$ = 9.656 MG

Q_{inflow} = 29,682 gal/day

$T_{Cell\ \#2}$ = **325** days > 151 days

Future (2045) Storage Time

$V_{cell\ \#2}$ = 9.656 MG

Q_{inflow} = 69,534 gal/day

$T_{Cell\ \#2}$ = **139** days < 151 days

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Capacity of Winter Storage Lagoon

Future (2065) Storage Time

$V_{cell\ \#2}$ =	9.656	MG				
Q_{inflow} =	125,587	gal/day				
$T_{Cell\ \#2}$ =	**77**	days	<	151	days	

Maximum Capacity

$V_{cell\ \#2}$ =	9.656	MG						
Q_{inflow}* =	**63,947**	**gal/day**	=	**44**	**gpm**	=	**433**	**Total ERUs**
$T_{Cell\ \#2}$ =	**151**	days	=	151	days			

*Use 'Goal Seek' to find Flow at which Retention Time equals 151 days.

Required Size of Additional Winter Storage Cell (sized for 2065)

$V_{cell\ \#2}$ =	9.656	MG			
$V_{New\ Cell}$ =	9.433	MG			
Total Cell V =	**19**	MG			
$Q_{inflow\ in\ 2065}$ =	125,587	gal/day			
$T_{New\ Cell}$ =	**152**	days	>	151	days

HRT Requirements:

- Source = EPA: Principles of Design and Operations of Wastewater Treatment Pond Systems for Plant Operators, Engineers, and Managers
- No specific requirements in Idaho - min HRT must be considered with regard to environmental conditions (pg A-2)
- Detention Time range from 20 - 180 days (pg 3-8)
- Detention Time can approach 200 days in northern climates where discharge restrictions prevail (pg 3-8)
- Total HRT in system is 120-180 days in climates with average Winter Air Temp < 0 Celcius (32 Fahrenheit) (pg 3-9)

DRAFT

Water Balance

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	5/8/2026
Created By:	Laura Radke, PE

Legend:

Input
Linked Cell
Calculation
Answer (Good)
Answer (Bad)

Design Flows

Current ADF =	20.6	gpm	0.03	MGD
2045 ADF =	48.3	gpm	0.07	MGD
2065 ADF =	87.2	gpm	0.13	MGD
ADF per ERU =	0.10	gpm		
ADF per ERU =	148	gpd		

Number of ERUs

Current (2025) =	201
Future (2045) =	471
Future (2065) =	851

Land Reuse Criteria

Current Land App Permit Restrictions:

Growing Season =	214	days
Discharge Limit =	45.208	MG/year
Discharge Acerage =	42	ac

Current Land App Site:

Length of Wheel Line =	638	ft
Land App Area** =	29.4	ac
Discharge Limit* =	31.599	MG/year
=	0.148	MGD

*Based on Permit: 29.4 ac * (45.208 MG/yr / 42 ac)

**Based on a circular pivot. Area calculated based on length of wheel line.

Current System Capacity*:

*Based on current land app site

$$\text{System } Capacity\ based\ on\ Water\ Balance = Influent - Effluent$$

Current Influent =	0.03	MGD
=	10.83	MG/year
Effluent (Discharge Limit) =	31.6	MG/year

Influent - Effluent:

Influent - Effluent =	-20.76	MG/year
	-0.057	MGD

Conversion to # ERUs:

1 ERU =	148	gpd
# Add ERUs capacity =	386	ERUs

Maximum System Capacity:

$$\#\ Add\ ERUs + Current\ \#\ ERUs$$

Maximum System Capacity =	587	ERUs

Therefore, the system has the capacity to handle an additional 0.057 MG per day. With an ERU being equivalent to 148 gpd, the system has the capacity for an additional 386 ERUs based on the water balance. Therefore, the system has capacity for a total of 587 ERUs.

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Water Balance

Future (2045) System Capacity*:

*Based on current land app site

$$\text{System } Capacity\ based\ on\ Water\ Balance = Influent - Effluent$$

2045 Influent =	0.07	MGD
=	25.38	MG/year
Effluent (Discharge Limit) =	31.6	MG/year

Influent - Effluent:

Influent - Effluent =	-6.22	MG/year
	-0.017	MGD

Conversion to # ERUs:

1 ERU =	148	gpd
# Add ERUs capacity =	115	ERUs

In 2045, the system will be able to handle an additional 115 ERUs.

Future (2065) System Capacity*:

*Based on current land app site

$$\text{System } Capacity\ based\ on\ Water\ Balance = Influent - Effluent$$

2065 Influent =	0.13	MGD
=	45.84	MG/year
Effluent (Discharge Limit) =	31.6	MG/year

Influent - Effluent:

Influent - Effluent =	14.24	MG/year
	0.039	MGD

Conversion to # ERUs:

1 ERU =	148	gpd
# Add ERUs capacity =	-264	ERUs

In 2065, the system will be out of capacity by 264 EDUs.

Area Required in 2065:

Min Discharge Limit* =	45.84	MG/Year
Min Area**=	42.6	ac

*Represents 2065 Influent

**Based on comparison of current permit requirements and min discharge limit = (45.84 MG/yr * 42 ac) / 45.208 MG/yr

In 2065, the land application site must have a minimum area of 42.6 ac with a capacity of 45.84 MG/yr.

DRAFT

Land Application Site - Minimum Area Calculations

Project:	City of Tetonia WWFPS
Project Number:	17101
Last Revised on:	5/11/2026
Created By:	Laura Radke, PE

Legend:

Linked Cell

Calculation

Slow Rate Land Application by Sprinkler Irrigation:

Current System ADF =	0.030	MG/day	**10.8**	MG/year
Future (2045) System ADF =	0.070	MG/day	**25.4**	MG/year
Future (2065) System ADF =	0.126	MG/day	**45.8**	MG/year

Avg. ET for growing season =	30.7	in/year
Avg. precipitation for growing season =	7.74	in/year

Minimum Size Required of Irrigated Area:

$$Irrigated\ Area = \frac{Daily\ Flow\left(\frac{gal}{day}\right)}{7.48\ \frac{gal}{ft^3}} * \frac{12\ \frac{in}{ft}}{ET - Precip.} * \frac{acre}{43{,}560\ ft^2}$$

Current Irrigated Area Req.=	**17.4**	acres
Future (2045) Irrigated Area Req. =	**40.7**	acres
Future (2065) Irrigated Area Req. =	**73.5**	acres

Existing Land Application Site:

Irrigated Area =	29.4	acres

$$Land\ App\ Area\ Req. \leq Land\ App.\ Area\ Available$$

Current Required Area =	17.4	<	29.4	ac
Future (2045) Required Area =	40.7	>	29.4	ac
Future (2065) Required Area =	73.5	>	29.4	ac

Additional Area Required in 2045 =	**11.4**	ac
Additional Area Required in 2065 =	**44.2**	ac

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Soil Aquifer Treatment by Rapid Infiltration Basins

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	3/6/2026
Created By:	Laura Radke, PE

Legend:
- Input
- Linked Cell
- Calculation
- Answer (Good)

1. Wastewater Flow Rate:

Current System ADF =	0.030	MG/day	10.8	MG/year
Future (2045) System ADF =	0.070	MG/day	25.4	MG/year
Future (2065) System ADF =	0.126	MG/day	45.8	MG/year

# of months in Summer (Min Temp > 32°F) = 5 months

WW Flow Rate (in 2045) = 166,883 gal/day
WW Flow Rate (in 2065) = 301,409 gal/day

2. Soil Percolation Rate

Ksat =	0.57	to	1.98	in/hr	Use:	0.57
Reduction Factor =	4%	to	10%		Use:	6%

Soil Percolation Rate = 0.82 in/day
Max Percolation Rate = 4.75 in/day (assuming 1.98 in/hr with 10% reduction factor)

3. Wet/Dry Ratio

Wet/Dry Ratio = 0.25

4. Area Calculation

RI Basin Area (in 2045) = 7.5 acres
RI Basin Area (in 2065) = 13.5 acres

Min # of Basins (2045) = 5

Wet Basins = 1
Dry Basins= 4
Wet/Dry = 0.25

Min Area of each Basin (2045) = 1.5 acres → **Use:** 2.0
Min Area of each Basin (2065) = 2.7 acres

OR

# of total Basins (in 2065) = 7 (using Area of 2045 Basins of 2.0 ac)

Water depth in 1 day = 3.1 in
Water depth in 2 day = 6.2 in

Water Depth/Dry Days	< or >	Max Soil Percolation Rate
0.77 in/day	<	0.82 in/day

To meet criteria above, Basin area was increased from the min required by the following:

Additional Area of Basin = 0.5 acres
Recommended Area per Basin = 2.0 acres

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Appendix B – Engineer's Opinion of Probable Cost

1. Alternative 1
2. Alternative 2
3. Alternative 3
4. Alternative 4
5. Alternative 5
6. Alternative 7
7. Alternative 8
8. Alternative 9
9. Alternative 10
10. Alternative 11
11. Alternative 12

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SUNRISE ENGINEERING, INC.

CONSULTING ENGINEERS AND SURVEYORS

Opinion of Probable Cost

System:	Collection System Improvements	Project Name:	Tetonia WWFPS
Alternative:	Alternative 1	Project No.:	16084
Project:	Cleaning & Video Inspection	Last Revised On:	4/13/2026
Owner:	City of Tetonia	Created By:	Laura Radke, PE
		Checked By:	Assan, PhD, PE

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Pipe Cleaning/Flushing	20,165	LF	$ 1.00	$ 20,165
2	Video Inspection of Pipe	20,165	LF	$ 1.00	$ 20,165
	SUBTOTAL				**$ 40,330**
3	Mobilization	1	%	5%	$ 2,017
	TOTAL				**$ 42,347**
4	Engineering - Review of Inspection Videos	1	%	10%	**$ 4,235**
				TOTAL ALTERNATIVE 1 COST	**$ 46,581**

Assumptions:

- Cleaning/Flushing should be performed annually.
- Video Inspections should be performed annually to bi-annually, as funding permits.

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SUNRISE ENGINEERING, INC.

CONSULTING ENGINEERS AND SURVEYORS

Opinion of Probable Cost

System:	Collection System Improvements	Project Name:	Tetonia WWFPS
Alternative:	Alternative 2	Project No.:	16084
Project:	Monitoring Improvements	Last Revised On:	4/13/2026
Owner:	City of Tetonia	Created By:	Laura Radke, PE
		Checked By:	Assan, PhD, PE

ALTERNATIVE 2A - SAMPLE TESTING

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Monthly BOD & TKN Sample Testing	12	EA	$ 200.00	$ 2,400
				TOTAL ALTERNATIVE 2A COST	**$ 2,400**

Assumptions:

- Monthly samples result in 12 total annual samples of the influent and effluent. This cost represents annual costs.

ALTERNATIVE 2B - IMPROVING SCADA

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Connect SCADA to existing hardware at LS	1	LS		$ -
2	Provide Remote Operating features (via phones)	1	LS		$ -
3	Connect Land Application Site to SCADA System	1	LS	$ 35,000.00	$ 35,000
				TOTAL ALTERNATIVE 2B COST	**$ 35,000**

Assumptions:

- Cost of SCADA at Land Application Site is based on proposed cost presented at Tetonia City Hall on May 12, 2026

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SUNRISE ENGINEERING, INC.

CONSULTING ENGINEERS AND SURVEYORS

Opinion of Probable Cost

System:	Collection System Improvements	Project Name:	Tetonia WWFPS
Alternative:	Alternative 3	Project No.:	16084
Project:	Lift Station Improvements	Last Revised On:	5/14/2026
Owner:	City of Tetonia	Created By:	Laura Radke, PE
		Checked By:	Assan, PhD, PE

ALTERNATIVE 3A - RECOMMENDED LS IMPROVEMENTS FROM ANNUAL LS REPORT

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Installation of Lifting Bales on Pumps	1	LS	$ 1,133.00	$ 1,133
2	Installation of Redundance Emergency Level Control System	1	LS	$ 1,779.28	$ 1,779
3	Installation of 3-Position Swtich	1	LS		$ -
4	Calibration of Exisiting Flow Meter	1	LS	$ 1,250.00	$ 1,250
5	Construction of Permanent Stand for WW Debris Collection	1	LS	$ 3,100.00	$ 3,100
6	Placement of Submersible Transducer on a Weight & Chain Kit	1	LS	$ 2,000.00	$ 2,000
7	Adjustment of Pump Overloads	1	LS	$ 500.00	$ 500
				TOTAL ALTERNATIVE 3A COST	**$ 9,762**

Assumptions:

- The maintenance items listed in the Annual Lift Station Report were not included in this cost estimate, as they are anticipated to be performed by City Staff members at little to zero additional cost to the City.

ALTERNATIVE 3B - NON-CLOG PUMP

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Install new Non-Clog Pump & Motor	1	LS	$ 4,967.00	$ 4,967
	SUBTOTAL				**$ 4,967**
2	Engineering - Selection of Pump	1	%	10%	**$ 497**
				TOTAL ALTERNATIVE 3B COST	**$ 5,464**

Assumptions:

- Cost of Pump and Motor based on Barmesa 4BWSE504DS Non-Clog

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SUNRISE ENGINEERING, INC.

CONSULTING ENGINEERS AND SURVEYORS

Opinion of Probable Cost

ALTERNATIVE 3C - UPSIZING WET WELL FOR FUTURE FLOWS

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	CONSTRUCTION				
1	Earthwork	1	LS	$ 30,000	$ 30,000
2	Lift Station Wet Well Structure	1	EA	$ 110,000	$ 110,000
3	Removal of Existing Equipment	1	LS	$ 6,000	$ 6,000
4	Updating Lift Station Pump System & Control Panel	1	LS	$ 65,000	$ 65,000
5	Updating Lift Station Electrical	1	LS	$ 50,000	$ 50,000
6	Updating Metering	1	LS	$ 12,000	$ 12,000
7	Re-connecting new LS to Emergency Generator and Switch	1	LS	$ 200,000	$ 200,000
8	Re-routing gravity and Pressure Piping	1	LS	$ 40,000	$ 40,000
9	Installation of new SCADA system	1	LS	$ 20,000	$ 20,000
10	Bypass Pumping / Dewatering	1	LS	$ 7,100	$ 7,100
	SUBTOTAL				**$ 540,100**
11	Mobilization	1	%	5%	$ 27,005
12	Construction Contingency	1	%	15%	$ 81,015
	CONSTRUCTION TOTAL				**$ 648,120**
13	Engineering Design	1	%	10%	**$ 64,812**
14	Construction Inspection	1	%	5%	**$ 32,406**
				TOTAL ALTERNATIVE 3C COST	**$ 745,338**

Assumptions:

- Estimates based on opinion of costs included in Nephi WWFPS (2022), St Charles WWFPS (2024), and City of Paris WWFPS (2025)

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Opinion of Probable Cost

System:	Collection System Improvements	Project Name:	Tetonia WWFPS
Alternative:	Alternative 4	Project No.:	16084
Project:	Pipe Improvements	Last Revised On:	4/13/2026
Owner:	City of Tetonia	Created By:	Laura Radke, PE
		Checked By:	Assan, PhD, PE

ALTERNATIVE 4A - PIPELINE MAINTENANCE

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	MOST SEVERE PIPE SEGMENTS (RATING 5)				
ALT 4A.1	Flush & Clean Pipe between MH-4 & MH-3	100	LF	$ 1.00	$ 100
	SUBTOTAL				**$ 100**
	SEVERE PIPE SEGMENTS (RATING 4)				
ALT 4A.2	Flush & Clean Pipe between MH-71 & MH-70	184	LF	$ 1.00	$ 184
ALT 4A.3	Flush & Clean Pipe between MH-66 & MH-55	194	LF	$ 1.00	$ 194
ALT 4A.4	Flush & Clean Pipe between MH-46 & MH-45	242	LF	$ 1.00	$ 242
ALT 4A.5	Flush & Clean Pipe between MH-3 & MH-2	76	LF	$ 1.00	$ 76
	SUBTOTAL				**$ 696**
	MODERATE PIPE SEGMENTS (RATING 3)				
ALT 4A.6	Flush & Clean Pipe between MH-30 & MH-15	167	LF	$ 1.00	$ 167
ALT 4A.7	Flush & Clean Pipe between MH-15 & MH-64	341	LF	$ 1.00	$ 341
ALT 4A.8	Flush & Clean Pipe between MH-75 & MH-70	153	LF	$ 1.00	$ 153
ALT 4A.9	Flush & Clean Pipe between MH-67 & MH-55	395	LF	$ 1.00	$ 395
ALT 4A.10	Flush & Clean Pipe between MH-62 & MH-11	197	LF	$ 1.00	$ 197
ALT 4A.11	Flush & Clean Pipe between MH-61 & MH-60	218	LF	$ 1.00	$ 218
ALT 4A.12	Flush & Clean Pipe between MH-73 & MH-72	137	LF	$ 1.00	$ 137
ALT 4A.13	Flush & Clean Pipe between MH-52 & MH-51	186	LF	$ 1.00	$ 186
ALT 4A.14	Flush & Clean Pipe between MH-49 & MH-48	365	LF	$ 1.00	$ 365
ALT 4A.15	Flush & Clean Pipe between MH-53 & MH-56	332	LF	$ 1.00	$ 332
ALT 4A.16	Flush & Clean Pipe between MH-43 & MH-42	364	LF	$ 1.00	$ 364
ALT 4A.17	Flush & Clean Pipe between MH-36 & MH-34	354	LF	$ 1.00	$ 354
ALT 4A.18	Flush & Clean Pipe between MH-41 & MH-40	205	LF	$ 1.00	$ 205
ALT 4A.19	Flush & Clean Pipe between MH-28 & MH-27	357	LF	$ 1.00	$ 357
ALT 4A.20	Flush & Clean Pipe between MH-27 & MH-26	371	LF	$ 1.00	$ 371
ALT 4A.21	Flush & Clean Pipe between MH-9 & MH-8	448	LF	$ 1.00	$ 448
ALT 4A.22	Flush & Clean Pipe between MH-8 & MH-7	330	LF	$ 1.00	$ 330
ALT 4A.23	Flush & Clean Pipe between MH-10 & MH-29	365	LF	$ 1.00	$ 365
	SUBTOTAL				**$ 5,285**
				TOTAL ALTERNATIVE 4A COST	**$ 6,081**

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Opinion of Probable Cost

ALTERNATIVE 4B - PIPELINE REPAIR

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	MOST SEVERE PIPE SEGMENTS (RATING 5)				
ALT 4B.1	Remove Roots; Repair Joint(s); Replace Sagging/Corrosive Segments of Pipe	192	LF	$ 87.00	$ 16,704
ALT 4B.2	Repair Hole in Pipe; Repair Service	294	LF	$ 87.00	$ 25,578
ALT 4B.3	Remove Roots & Repair Joint(s)	161	LF	$ 87.00	$ 14,007
	Removal of Existing Pipe & Road	647	LF	$ 10.00	$ 6,470
	Replace Gravel Pavement	288	SY	$ 42.00	$ 12,077
	Bypass Pumping/Dewatering	647	LF	$ 20.00	$ 12,940
	SUBTOTAL				**$ 87,776**
	Mobilization	1	%	5%	$ 16,538
	Construction Contingency	1	%	15%	$ 49,613
	CONSTRUCITON TOTAL				**$ 154,292**
	Engineering Design	1	%	10%	**$ 15,429**
	Construction Inspection	1	%	5%	**$ 7,715**
				RATING 5 TOTAL	**$ 177,436**
	SEVERE PIPE SEGMENTS (RATING 4)				
ALT 4B.4	Repair Cracks/Fractions in Joint(s) & Pipe	246	LF	$ 87.00	$ 21,402
ALT 4B.5	Remove Roots & Repair Pipe	387	LF	$ 87.00	$ 33,669
ALT 4B.6	Repair Corrosion at Joint(s); Replace Sagging Pipe	218	LF	$ 87.00	$ 18,966
ALT 4B.7	Replace Sagging Pipe	114	LF	$ 87.00	$ 9,918
ALT 4B.8	Repair Joint(s) Separation; Repair Cracking of Pipe	240	LF	$ 87.00	$ 20,880
ALT 4B.9	Remove Roots from Service & Replace Sagging Pipe	229	LF	$ 87.00	$ 19,923
ALT 4B.10	Replace Sagging Pipe	78	LF	$ 87.00	$ 6,786
ALT 4B.11	Remove Roots & Repair Joints	256	LF	$ 87.00	$ 22,272
ALT 4B.12	Replace Sagging Pipe	23	LF	$ 87.00	$ 2,001
	Removal of Existing Pipe & Road	1,791	LF	$ 10.00	$ 17,910
	Replace Gravel Pavement	796	SY	$ 42.00	$ 33,432
	Bypass Pumping/Dewatering	1,791	LF	$ 20.00	$ 35,820
	SUBTOTAL				**$ 242,979**
	Mobilization	1	%	5%	$ 16,538
	Construction Contingency	1	%	15%	$ 49,613
	CONSTRUCITON TOTAL				**$ 309,130**
	Engineering Design	1	%	10%	**$ 30,913**
	Construction Inspection	1	%	5%	**$ 15,457**
				RATING 4 TOTAL	**$ 355,500**

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	MODERATE PIPE SEGMENTS (RATING 3)				
4B.15	Remove Roots & Repair Joints	243	LF	$ 87.00	$ 21,141
4B.16	Repair Sagging Pipe; Repair Joint Deflections	364	LF	$ 87.00	$ 31,668
4B.17	Remove Roots & Repair Joints	357	LF	$ 87.00	$ 31,059
4B.18	Remove Roots & Repair Joints	341	LF	$ 87.00	$ 29,667
4B.19	Repair Service Connection	385	LF	$ 87.00	$ 33,495
4B.20	Repair Corrosion of Pipe	153	LF	$ 87.00	$ 13,311
4B.21	Repair Cracking and Corrosion of Pipe	346	LF	$ 87.00	$ 30,102
4B.22	Repair Corrosion in Joint(s)	390	LF	$ 87.00	$ 33,930
4B.23	Repair Joint(s)	355	LF	$ 87.00	$ 30,885
4B.24	Repair Corrosion at Joint(s)	395	LF	$ 87.00	$ 34,365
4B.25	Repair Corrosion at Joint(s)	387	LF	$ 87.00	$ 33,669
4B.26	Repair Corrosion at Service connection; Repair Service Connection	302	LF	$ 87.00	$ 26,274
4B.27	Repair Cracking of Pipe	206	LF	$ 87.00	$ 17,922
4B.28	Repair Sagging Pipe	227	LF	$ 87.00	$ 19,740
4B.29	Repair Sagging Pipe	227	LF	$ 87.00	$ 19,749
4B.30	Repair Corrosion of Pipe	137	LF	$ 87.00	$ 11,919
4B.31	Remove Roots & Repair Joints; repair corrosion near service connection	320	LF	$ 87.00	$ 27,840
4B.32	Remove Roots from Service Connection	332	LF	$ 87.00	$ 28,884
4B.33	Repair Cracking of Pipe	131	LF	$ 87.00	$ 11,397
4B.34	Repair Joint(s) & remove roots in joints	396	LF	$ 87.00	$ 34,452
4B.35	Repair Corrosion of Pipe	330	LF	$ 87.00	$ 28,710
4B.36	Repair Corrosion of Pipe	341	LF	$ 87.00	$ 29,667
4B.37	Repair Corrosion of Pipe	377	LF	$ 87.00	$ 32,799
	Removal of Existing Pipe & Road	7,042	LF	$ 10.00	$ 70,419
	Replace Gravel Pavement	3,130	SY	$ 42.00	$ 131,449
	Bypass Pumping/Dewatering	7,042	LF	$ 20.00	$ 140,838
	SUBTOTAL				**$ 955,351**
	Engineering Design	1	%	10%	**$ 95,535**
	Construction Inspection	1	%	5%	**$ 47,768**
				RATING 3 TOTAL	**$ 1,098,654**
				TOTAL ALTERNATIVE 4B COST	**$ 1,631,590**

Assumptions:

- Mobilization is determined per Pipe Repair
- Assume 4' wide trenches

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Opinion of Probable Cost

ALTERNATIVE 4C - PIPELINE REPLACEMENT					
ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	CONSTRUCTION				
ALT 4B.1	Install 12" Parallel PVC Sewer Main	2,310	LF	$ 96.00	$ 221,760
	Construct new 48" Manhole	6	EA	$ 9,039.00	$ 54,234
	Replacement of Gravel Pavement	1,027	SY	$ 42.00	$ 43,120
	SUBTOTAL				**$ 319,114**
	Mobilization	1	%	5%	$ 15,956
	Construction Contingency	1	%	15%	$ 47,867
	CONSTRUCTION TOTAL				**$ 382,937**
	Engineering Design	1	%	10%	**$ 38,294**
	Construction Inspection	1	%	5%	**$ 19,147**
				TOTAL ALTERNATIVE 4C COST	**$ 440,377**

Assumptions:

- Assume 4' wide trenches

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Opinion of Probable Cost

System:	Collection System Improvements	Project Name:	Tetonia WWFPS
Alternative:	Alternative 5	Project No.:	16084
Project:	Manhole Improvements	Last Revised On:	4/10/2026
Owner:	City of Tetonia	Created By:	Laura Radke, PE
		Checked By:	Assan, PhD, PE

ALTERNATIVE 5A - MANHOLE INVENTORY

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Survey - Manhole Inventory	1	LS	$ 4,200.00	$ 4,200
2	Engineering - Create an updated Map and Model	1	LS	$ 2,640.00	$ 2,640
				TOTAL ALTERNATIVE 5A COST	**$ 6,840**

Assumptions:

- The Manhole Inventory should be done by a surveyor and should include the Manhole location along with Invert Elevations. The inventory should also include the condition of the Manhole and wether or not it is burried or elevated too high and wether the Lid is traffic rated, as well as wether or not the manhole has a concrete collar. The GIS map should be updated based on this information and it is recommended to re-run the sewer model using updated slopes.

ALTERNATIVE 5B - MANHOLE REPAIRS

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Replace Manhole Lid	3	LS	$ 420.00	$ 1,260
2	Construct Manhole Collar	5	LS	$ 420.00	$ 2,100
3	Elevate Manhole to match Finished Ground Elev.	5	LS	$ 1,000.00	$ 5,000
				TOTAL ALTERNATIVE 5B COST	**$ 8,360**

Assumptions:

- Quantities are estimates, based on City Staff input. The quantity may change based on findings of Manhole Inventory.

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Opinion of Probable Cost

System:	Treatment System Improvements	Project Name:	Tetonia WWFPS
Alternative:	Alternative 7	Project No.:	16084
Project:	Additional Aerator	Last Revised On:	5/18/2026
Owner:	City of Tetonia	Created By:	Laura Radke, PE
		Checked By:	Assan, PhD, PE

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	TREATMENT PLANT				
1	Aerator	1	EA	$ 13,217.00	$ 13,217
2	Accessories, controls, startup services, electrical components, mooring cables for Aerator	1	LS	$ 2,643.40	$ 2,643
3	Installation of Aerator	1	LS	$ 13,217.00	$ 13,217
				TOTAL ALTERNATIVE 7 COST	**$ 29,077**

Assumptions:

- Aerator cost provided by Newterra for 5hp floatin TORNADO aerator on pontoons. Cost includes aerator and shipping. (Estimate provided on May 18, 2026).
- Accessories, controls, startup services, electrical components, and mooring cables for aerator were not included in Newterra quote. This cost was estimated to be 20% of the cost of the aerator.
- Installation of the aerator was estimated to be 100% of the cost of the aerator.

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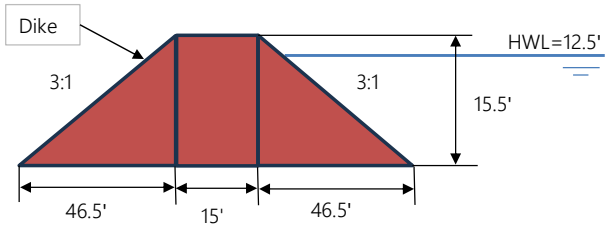
Opinion of Probable Cost

System:	Treatment System Improvements	Project Name:	Tetonia WWFPS
Alternative:	Alternative 8	Project No.:	16084
Project:	Additional Aerated Treatment Lagoon (1.75 ac)	Last Revised On:	5/18/2026
Owner:	City of Tetonia	Created By:	Laura Radke, PE
		Checked By:	Assan, PhD, PE

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	CONSTRUCTION				
1	Clearing and Grubbing	1	LS	$ 30,000.00	$ 30,000
2	Earthwork Excavation	2,910	CY	$ 30.00	$ 87,300
3	Earthwork Dike Construction	43,150	CY	$ 25.00	$ 1,078,750
4	BTL 60-mil HDPE Liner	107,171	SF	$ 2.00	$ 214,343
5	Shipping of BTL 60-mil HDPE Liner	3	EA	$ 250.00	$ 750
6	Installation Tape for BTL 60-mil HDPE Liner	1,029	LF	$ 1.31	$ 1,348
7	Import and Place Rip Rap	1,830	CY	$ 45.00	$ 82,350
8	Installation of Inlet Control Structure	1	LS	$ 30,000.00	$ 30,000
9	Installation of Transfer Structure	1	EA	$ 25,000.00	$ 25,000
10	Installation of Slide Gate	2	EA	$ 4,000.00	$ 8,000
11	Installation of 8" PVC Sewer Piping	350	LF	$ 87.00	$ 30,450
12	Installation of Chain Link Fence	1,392	LF	$ 30.00	$ 41,760
13	Materials Testing	1	LS	$ 60,000.00	$ 60,000
14	Aerators	2	EA	$ 13,217.00	$ 26,434
15	Accessories, Startup, and Installation of Aerators	2	LS	$ 15,860.40	$ 31,721
	SUBTOTAL				**$ 1,748,205**
16	Mobilization	1	%	5%	$ 87,410
17	Construction Contingency	1	%	15%	$ 262,231
	CONSTRUCTION TOTAL				**$ 2,097,846**
18	Engineering Design	1	%	10%	**$ 209,785**
19	Construction Inspection	1	%	5%	**$ 104,892**
				TOTAL ALTERNATIVE 8 COST	**$ 2,412,523**

Assumptions:

- 5.1 MG Lagoon with dimensions similar to the exisiting Treatment Lagoon
  - HWL Area = 1.75 ac
  - Area at Top = 2.0 ac
  - Freeboard = 3 ft
  - Width x Length at HWL = 235 ft x 325 ft
  - Width x Length at Top = 253 ft x 343 ft
  - Perimeter at Top = 2 * (253 ft + 343 ft) = 1,192 ft
  - Total Depth to Top = 15.5 ft
  - Slope = 3:1
  - Width of Dike = 15 ft
  - Perimeter of Center of Dike = 1,222 ft



- Assume excavation depth = 2 ft across the lagoon footprint, with remaining lagoon depth achieved through embankments
- Assume Rip Rap rock size = 12"
- HDPE liner cost is based on BTL 60-mil HDPE liner quote provided by Silver Creek Supply (Cost provided May 18, 2026)
- Assume 50 ft offset from top width and length of lagoon to fence
- Aerator cost provided by Newterra; accessories & startup cost estimated as 20% and installation cost estimated as 100% of aerator cost

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Opinion of Probable Cost

System:	Treatment System Improvements	Project Name:	Tetonia WWFPS
Alternative:	Alternative 9A	Project No.:	16084
Project:	Mechanical Treatment Plant (0.13 MGD)	Last Revised On:	5/14/2026
Owner:	City of Tetonia	Created By:	Laura Radke, PE
		Checked By:	Assan, PhD, PE

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	TREATMENT PLANT				
1	Materials Testing	1	LS	$ 50,000.00	$ 50,000
2	Structural Materials	1	LS	$ 294,860.00	$ 294,860
3	Misc. Yard Concrete (Sidewalks, pads, etc.)	1	LS	$ 19,840.00	$ 19,840
4	Installation of 12" Gravity Pipe	1,000	LF	$ 96.00	$ 96,000
5	Installation of 6" Force Main Pipe	1,000	LF	$ 272.50	$ 272,500
6	Manholes (includes installation)	1	LS	$ 207,117.63	$ 207,118
7	General Site Construction	1	LS	$ 819,550.00	$ 819,550
8	Headworks Building	1	LS	$ 1,269,000.00	$ 1,269,000
9	Pump Station 1	1	LS	$ 259,610.00	$ 259,610
10	Aero-Mod Concrete	1	LS	$ 1,170,770.00	$ 1,170,770
11	Operations Building	1	LS	$ 2,690,940.00	$ 2,690,940
12	Pump Station 2	1	LS	$ 392,610.00	$ 392,610
13	Composting	1	LS	$ 336,000.00	$ 336,000
14	Miscellaneous Equipment and Furnishings	1	LS	$ 73,760.00	$ 73,760
15	Yard Process/Piping	1	LS	$ 29,910.00	$ 29,910
16	Mechanical & HVAC	1	LS	$ 79,720.00	$ 79,720
17	Controls and Instrumentation	1	LS	$ 214,660.00	$ 214,660
18	Equipment	1	LS	$ 3,961,050.00	$ 3,961,050
	SUBTOTAL				**$ 12,237,898**
	OFFSITE IMPROVEMENTS				
19	Offsite Water Improvements	1	LS	$ 203,800.00	$ 203,800
20	Offsite Sewer Improvements	1	LS	$ 681,250.00	$ 681,250
	SUBTOTAL				**$ 885,050**
21	Mobilization	1	%	5%	$ 656,147
22	Construction Contingency	1	%	15%	$ 1,968,442
	CONSTRUCTION TOTAL				**$ 15,747,537**
23	Engineering Design	1	%	10%	**$ 1,574,754**
24	Construction Inspection	1	%	5%	**$ 787,377**
25	Attorney and Fiscal Fees	1	LS	$ 60,000.00	**$ 60,000**
	TOTAL ALTERNATIVE 9A COST				**$ 18,169,668**

Assumptions:

- Manholes include regular manholes, manhole for metering, re-aeration, DO monitoring, and effluent metering. This also includes the meters inside the manholes.
- Offiste Water Improvements includes bringing a water main to the treatment plant site and connecting a new service and a hydrant.
- Equipment includes UV Disinfection & Controls; Sludge Dewatering, Conveyor System & Controls; Reaerations & Controls; Biological Treatment Process & Controls; Headwoks Building Odor Scrubber & Controls; Grit Trap, Classifier & Controls; Screen, Screen Conitioning Equipment & Controls; Cloth Filters; Dryer & Components
- Offiste Sewer Improvements includes the installation of a 2,500 ft reuse water line from the plant to a potential Creek discharge location.

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Opinion of Probable Cost

System:	Treatment System Improvements	Project Name:	Tetonia WWFPS
Alternative:	Alternative 10	Project No.:	16084
Project:	Sludge Handling and Disposal	Last Revised On:	5/19/2026
Owner:	City of Tetonia	Created By:	Laura Radke, PE
		Checked By:	Assan, PhD, PE

ALTERNATIVE 10 - SLUDGE HANDLING AND DISPOSAL

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	CHEMICALS (OPTION 1)				
1	Chemicals	1.75	AC	$ 6,300.00	$ 11,025
				SLUDGE REDUCING CHEMICALS (OPTION 1) TOTAL	**$ 11,025**
	SLUDGE AERATING (OPTION 2)				
1	Sludge Aerating	1.75	AC	$ 10,000.00	$ 17,500
	SUBTOTAL				**$ 17,500**
2	Mobilization	1	%	5%	**$ 875**
3	Contingency	1	%	15%	**$ 2,625**
				SLUDGE AERATING (OPTION 2) TOTAL	**$ 21,000**
	SLUDGE DREDGING (OPTION 3)				
1	SONAR Sludge Depth Survey	1	LS	$ 6,000.00	$ 6,000
2	Sludge Dredging	1.75	AC	$ 250,000.00	$ 437,500
3	Sludge Disposal	400	TON	$ 140.00	$ 56,000
	SUBTOTAL				**$ 499,500**
4	Mobilization	1	%	5%	**$ 24,975**
5	Contingency	1	%	15%	**$ 74,925**
				SLUDGE DREDGING (OPTION 3) TOTAL	**$ 599,400**
				TOTAL ALTERNATIVE 10 COST	**$ 631,425**

Assumptions:

- Chemicals need to be added monthly. The cost shown above represents annual costs.

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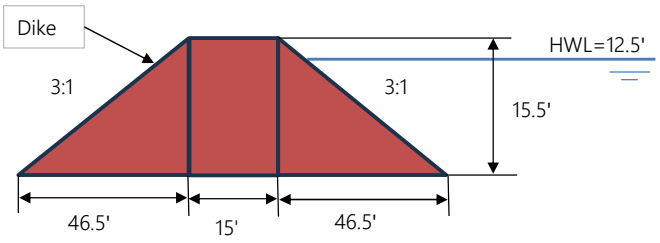
Opinion of Probable Cost

System:	Treatment System Improvements	Project Name:	Tetonia WWFPS
Alternative:	Alternative 11	Project No.:	16084
Project:	Additional Winter Storage Lagoon (9.4 MG)	Last Revised On:	5/18/2026
Owner:	City of Tetonia	Created By:	Laura Radke, PE
		Checked By:	Assan, PhD, PE

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	CONSTRUCTION				
1	Clearing and Grubbing	1	LS	$ 30,000.00	$ 30,000
2	Earthwork Excavation	6,140	CY	$ 30.00	$ 184,200
3	Earthwork Dike Construction	56,920	CY	$ 25.00	$ 1,423,000
4	BTL 60-mil HDPE Liner	180,510	SF	$ 2.00	$ 361,021
5	Shipping of BTL 60-mil HDPE Liner	4	EA	$ 250.00	$ 1,000
6	Installation Tape for BTL 60-mil HDPE Liner	1,972	LF	$ 1.31	$ 2,583
7	Import and Place Rip Rap	2,540	CY	$ 45.00	$ 114,300
8	Installation of Inlet Control Structure	1	LS	$ 30,000.00	$ 30,000
9	Installation of Transfer Structure	1	EA	$ 25,000.00	$ 25,000
10	Installation of Slide Gate	2	EA	$ 4,000.00	$ 8,000
11	Installation of 8" PVC Sewer Piping	700	LF	$ 87.00	$ 60,900
12	Installation of Chain Link Fence	1,782	LF	$ 30.00	$ 53,460
13	Materials Testing	1	LS	$ 60,000.00	$ 60,000
	SUBTOTAL				**$ 2,353,464**
14	Mobilization	1	%	5%	$ 117,673
15	Construction Contingency	1	%	15%	$ 353,020
	CONSTRUCTION TOTAL				**$ 2,824,157**
16	Engineering Design	1	%	10%	**$ 282,416**
17	Construction Inspection	1	%	5%	**$ 141,208**
				TOTAL ALTERNATIVE 11 COST	**$ 3,247,781**

Assumptions:

- 9.4 MG Lagoon with dimensions similar to the exisiting Winter Storage Lagoon
  - HWL Area = 3.1 ac
  - Area at Top = 3.4 ac
  - Freeboard = 3 ft
  - Width x Length at HWL = 280 ft x 475 ft
  - Width x Length at the Top = 298 ft x 493 ft
  - Perimeter at the Top = 2 * (298 ft + 493 ft) = 1,582 ft
  - Total Depth to Top = 15.5 ft
  - Slope = 3:1
  - Width of Dike = 15 ft
  - Perimeter of Center of Dike = 1,612 ft



- Assume excavation depth = 2 ft across the lagoon footprint, with remaining lagoon depth achieved through embankments
- Assume Rip Rap rock size = 12"
- HDPE liner cost is based on BTL 60-mil HDPE liner quote provided by Silver Creek Supply (Cost provided May 18, 2026)
- Assume 50 ft offset from top width and length of lagoon to fence

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SUNRISE ENGINEERING, INC.

CONSULTING ENGINEERS AND SURVEYORS

Opinion of Probable Cost

System:	Treatment System Improvements	Project Name:	Tetonia WWFPS
Alternative:	Alternative 12	Project No.:	16084
Project:	Expansion of Land Application Site	Last Revised On:	5/19/2026
Owner:	City of Tetonia	Created By:	Laura Radke, PE
		Checked By:	Assan, PhD, PE

ALTERNATIVE 12A - 44.1 AC SLOW RATE LAND APPLICATION BY SPRINKLER IRRIGATION

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	CONSTRUCTION				
1	New Pump and Controls	2	LS	$ 75,000.00	$ 150,000
2	Electrical Work	1	LS	$ 60,000.00	$ 60,000
3	Misc. Equipment and Supplies	1	LS	$ 50,000.00	$ 50,000
4	Site Earthwork	44	AC	$ 500.00	$ 22,050
5	Power to Pivot	1,000	LF	$ 35.00	$ 35,000
6	Fencing	3,250	LF	$ 30.00	$ 97,500
7	6" Pump Line to Pivot from Chlorination Building	2,000	LF	$ 272.50	$ 545,000
8	6" Pump Line to Pivot from Secondary Source	1,000	LF	$ 272.50	$ 272,500
9	Run off Berm	12,991	CY	$ 25.00	$ 324,787
10	Pivot Sprinkler, Filter and Instrumentation	782	LF	$ 80.00	$ 62,560
11	Monitoring Well	2	EA	$ 3,500.00	$ 7,000
	SUBTOTAL				**$ 1,626,397**
12	Mobilization	1	%	5%	$ 81,320
13	Construction Contingency	1	%	15%	$ 243,960
	CONSTRUCTION TOTAL				**$ 1,951,676**
14	Land Acquisition	44	AC	$ 25,000.00	**$ 1,102,500**
15	Engineering Design	1	%	10%	**$ 195,168**
16	Construction Inspection	1	%	5%	**$ 97,584**
	TOTAL ALTERNATIVE 12A COST				**$ 3,346,928**

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SUNRISE ENGINEERING, INC.

CONSULTING ENGINEERS AND SURVEYORS

Opinion of Probable Cost

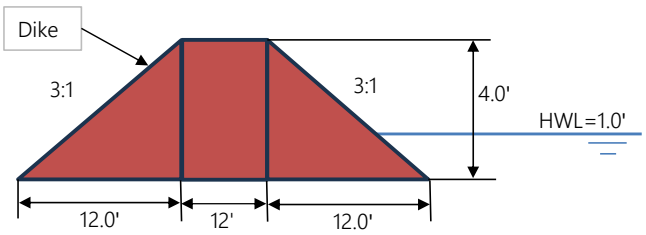
ALTERNATIVE 12B - SOIL AQUIFER TREATMENT BY RAPID INFILTRATION

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	CONSTRUCTION (PER BASIN)				
1	Clearing and Grubbing	1	LS	$ 30,000.00	$ 30,000
2	Earthwork Excavation	3,070	CY	$ 30.00	$ 92,100
3	Earthwork Dike Construction	4,720	CY	$ 25.00	$ 118,000
4	Import and Place Rip Rap	590	CY	$ 45.00	$ 26,550
5	Installation of Inlet Control Structure	1	LS	$ 30,000.00	$ 30,000
6	Installation of Transfer Structure	1	EA	$ 25,000.00	$ 25,000
7	Installation of Slide Gate	2	EA	$ 4,000.00	$ 8,000
8	Installation of 8" PVC Sewer Piping	700	LF	$ 87.00	$ 60,900
9	Materials Testing	1	LS	$ 10,000.00	$ 10,000
	SUBTOTAL				**$ 400,550**
10	Mobilization	1	%	5%	$ 20,028
11	Construction Contingency	1	%	15%	$ 60,083
	CONSTRUCTION TOTAL				**$ 480,660**
12	Land Acquisition	3	AC	$ 25,000.00	**$ 75,000**
13	Water Quality Impact Analysis	1	LS	$ 5,000.00	**$ 5,000**
14	Engineering Design	1	%	10%	**$ 48,066**
15	Construction Inspection	1	%	5%	**$ 24,033**
				TOTAL PER RI BASIN COST	$ 632,759

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	NUMBER OF RI BASINS NEEDED IN 2045	5	EA	$ 632,759.00	$ 3,163,795
	SUBTOTAL BY 2045				**$ 3,163,795**
2	NUMBER OF ADDITIONAL RI BASINS NEEDED IN 2065	2	EA	$ 632,759.00	$ 1,265,518
	SUBTOTAL BY 2065				**$ 1,265,518**
				TOTAL ALTERNATIVE 12B BASIN COST	**$ 4,429,313**

Assumptions:

- 2-ac Rapid Infiltration (RI) Basins with the following parameters:
  - HWL Area = 2.0 ac
  - Area at Top = 2.3 ac
  - Freeboard = 3 ft
  - Width x Length at HWL = 214 ft x 400 ft
  - Width x Length at the Top = 233 ft x 418 ft
  - Perimeter at the Top = 2 * (233 ft + 418 ft) = 1,302 ft
  - Total Depth to Top = 4.0 ft
  - Slope = 3:1
  - Width of Dike = 12 ft
  - Perimeter of Center of Dike = 1,326 ft



- Assume excavation depth = 1 ft across the lagoon footprint, with remaining lagoon depth achieved through embankments
- Assume Rip Rap rock size = 12"

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Appendix C – Model Results

1. Current (2025) ADF – Model Results
2. Current (2025) PHF – Model Results
3. 20-Year Future (2045) ADF – Model Results
4. 20-Year Future (2045) PHF – Model Results
5. 40-Year Future (2065) ADF – Model Results
6. 40-Year Future (2065) PHF – Model Results

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Current (2025) ADF - Model Results

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	3/16/2026
Created By:	Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max Velocity
C100	MH-55B	MH-54	125.65	CIRCULAR	0.67	0.27 ft/s
C102	MH-54	MH-63	372.29	CIRCULAR	0.67	0.37 ft/s
C104	MH-63	MH-35	361.74	CIRCULAR	0.67	0.4 ft/s
C106	MH-34	MH-41	407.57	CIRCULAR	0.67	0.48 ft/s
C108	MH-50	MH-52	152.44	CIRCULAR	0.67	0.32 ft/s
C110	MH-52	MH-51	186.97	CIRCULAR	0.67	0.2 ft/s
C112	MH-73	MH-72	145.02	CIRCULAR	0.67	0.33 ft/s
C114	MH-72	MH-51	370.85	CIRCULAR	0.67	0.43 ft/s
C116	MH-51	MH-48	358.95	CIRCULAR	0.67	0.49 ft/s
C118	MH-48	MH-45	378.56	CIRCULAR	0.67	0.5 ft/s
C120	MH-45	MH-42	212.02	CIRCULAR	0.67	0.61 ft/s
C122	MH-42	MH-41	141.87	CIRCULAR	0.67	0.65 ft/s
C124	MH-41	MH-40	213.04	CIRCULAR	0.67	0.78 ft/s
C126	MH-40	MH-39	264.56	CIRCULAR	0.67	0.85 ft/s
C128	MH-39	MH-38	364.69	CIRCULAR	0.67	0.86 ft/s
C130	MH-38	MH-29	349.53	CIRCULAR	0.67	0.65 ft/s
C132	MH-28	MH-27	364.16	CIRCULAR	0.67	0.16 ft/s
C134	MH-27	MH-26	371.87	CIRCULAR	0.67	0.4 ft/s
C136	MH-26	MH-25	368.38	CIRCULAR	0.67	0.53 ft/s
C138	MH-25	MH-24	188.85	CIRCULAR	0.67	0.52 ft/s
C140	MH-24	MH-29	184.81	CIRCULAR	0.67	0.42 ft/s
C142	CO-3	MH-40	165.2	CIRCULAR	0.67	0.41 ft/s
C148	CO-2	MH-40	128.84	CIRCULAR	0.67	0.12 ft/s
C150	CO-1	MH-40	137.77	CIRCULAR	0.67	0 ft/s
C152	MH-56	MH-46	235.36	CIRCULAR	0.67	0.31 ft/s
C154	MH-46	MH-45	364.91	CIRCULAR	0.67	0.38 ft/s
C156	MH-53	MH-47	226.67	CIRCULAR	0.67	0.48 ft/s
C158	MH-49	MH-48	362.83	CIRCULAR	0.67	0.36 ft/s
C160	MH-74	MH-48	323.52	CIRCULAR	0.67	0.52 ft/s
C162	MH-60	MH-59	398.92	CIRCULAR	0.67	0.63 ft/s
C164	MH-59	MH-58	203.06	CIRCULAR	0.67	0.53 ft/s
C166	MH-58	MH-10	228.91	CIRCULAR	0.67	0.57 ft/s
C168	MH-43	MH-42	367.88	CIRCULAR	0.67	0.5 ft/s
C170	MH-32	MH-67	355.49	CIRCULAR	0.67	0.24 ft/s
C172	MH-71	MH-70	181.67	CIRCULAR	0.67	0.41 ft/s
C174	MH-70	MH-67	419.71	CIRCULAR	0.67	0.3 ft/s
C176	MH-67	MH-55	388.27	CIRCULAR	0.67	0.55 ft/s

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Current (2025) ADF - Model Results

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	3/16/2026
Created By:	Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max Velocity
C178	MH-44	MH-37	243.91	CIRCULAR	0.67	0.41 ft/s
C180	MH-55	MH-64	311.38	CIRCULAR	0.67	0.54 ft/s
C182	MH-62	MH-11	221.62	CIRCULAR	0.67	0.73 ft/s
C184	MH-66	MH-55	196.86	CIRCULAR	0.67	0.8 ft/s
C186	MH-69	MH-68	145.91	CIRCULAR	0.67	0 ft/s
C188	MH-75	MH-70	154.13	CIRCULAR	0.67	0.35 ft/s
C190	MH-23	MH-22	332.31	CIRCULAR	0.67	0 ft/s
C192	MH-22	MH-21	546.92	CIRCULAR	0.67	0.11 ft/s
C194	MH-76	MH-21	315.86	CIRCULAR	0.67	0.38 ft/s
C196	MH-21	MH-20	332.37	CIRCULAR	0.67	0.25 ft/s
C198	MH-20	MH-19	507.86	CIRCULAR	0.67	0.75 ft/s
C200	MH-19	MH-18	128.47	CIRCULAR	0.67	0.72 ft/s
C202	MH-18B	MH-18	394.91	CIRCULAR	0.67	0.15 ft/s
C204	MH-18	MH-17	408.45	CIRCULAR	0.67	0.71 ft/s
C206	MH-30	MH-15	174.65	CIRCULAR	0.67	0.14 ft/s
C208	MH-16	MH-15	375.57	CIRCULAR	0.67	0.8 ft/s
C210	MH-15	MH-14	389.28	CIRCULAR	0.67	0.64 ft/s
C212	MH-14	MH-13	260.67	CIRCULAR	0.67	0.65 ft/s
C214	MH-13	MH-12	189.55	CIRCULAR	0.67	0.65 ft/s
C216	MH-12	MH-11	272.85	CIRCULAR	0.67	0.4 ft/s
C218	MH-11	MH-10	349.5	CIRCULAR	0.67	0.86 ft/s
C220	MH-10	MH-29	356.12	CIRCULAR	0.67	0.84 ft/s
C224	MH-29	MH-9	245.65	CIRCULAR	0.67	1.34 ft/s
C226	MH-9	MH-8	399.29	CIRCULAR	0.67	1.34 ft/s
C228	MH-7	MH-6	388.3	CIRCULAR	0.67	1.34 ft/s
C230	MH-5	MH-4	377.19	CIRCULAR	0.67	1.34 ft/s
C232	MH-4	MH-3	70.39	CIRCULAR	0.67	1.34 ft/s
C234	MH-8	MH-7	329.58	CIRCULAR	0.67	1.34 ft/s
C238	MH-64	MH-33	390.21	CIRCULAR	0.67	0.8 ft/s
C240	MH-15	MH-64	351.09	CIRCULAR	0.67	0.43 ft/s
C242	MH-17	MH-16	328.48	CIRCULAR	0.67	0.72 ft/s
C244	MH-65	MH-71	288.6	CIRCULAR	0.67	0.38 ft/s
C246	MH-31	MH-32	241.06	CIRCULAR	0.67	0.35 ft/s
C248	MH-68	MH-67	310.22	CIRCULAR	0.67	0.37 ft/s
C250	MH-37	MH-43	160.81	CIRCULAR	0.67	0.34 ft/s
C252	MH-61	MH-60	297.33	CIRCULAR	0.67	0.37 ft/s
C254	MH-33	MH-62	210.96	CIRCULAR	0.67	0.81 ft/s

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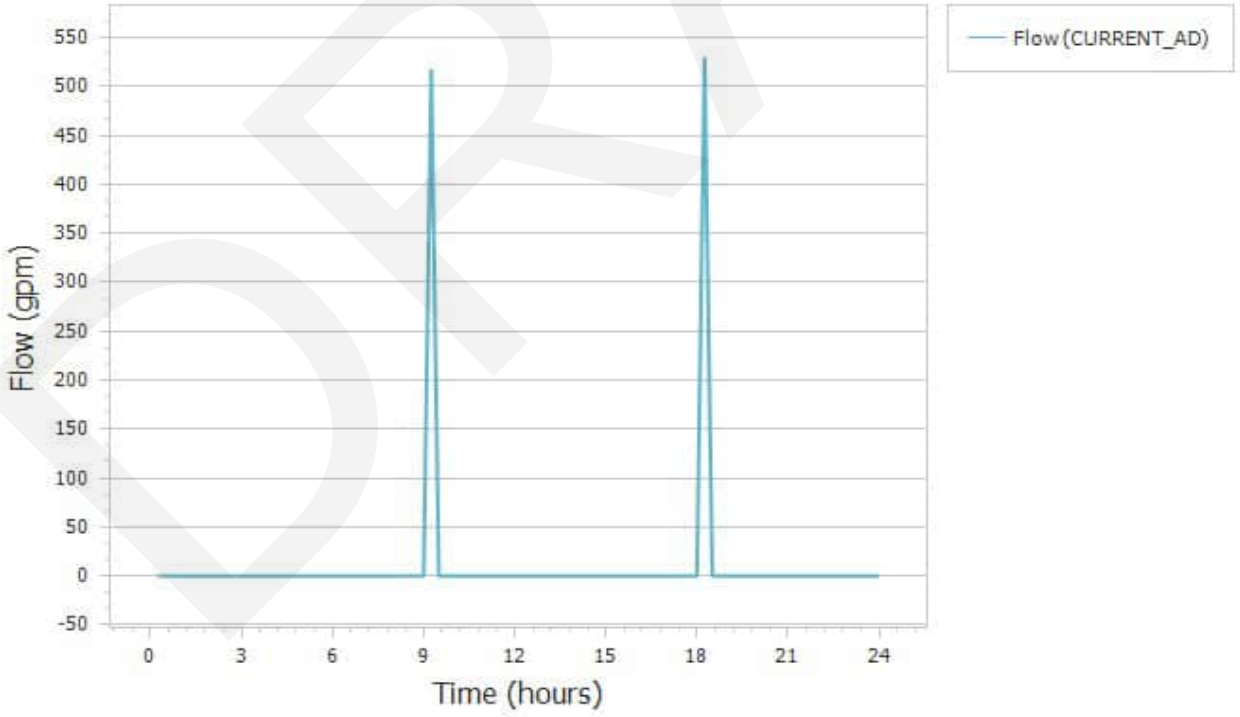
Current (2025) ADF - Model Results

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	3/16/2026
Created By:	Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max Velocity
C256	MH-45B	MH-45	320.84	CIRCULAR	0.67	0.31 ft/s
C260	MH-36	MH-34	391.95	CIRCULAR	0.67	0.44 ft/s
C262	MH-35	MH-36	390.29	CIRCULAR	0.67	0.36 ft/s
C264	MH-53	MH-56	375.05	CIRCULAR	0.67	0.36 ft/s
C266	MH-47	MH-46	368.19	CIRCULAR	0.67	0.25 ft/s
C268	MH-29B	MH-23	219.71	CIRCULAR	0.67	0 ft/s
C270	MH-6	MH-5	340.75	CIRCULAR	0.67	1.34 ft/s
C272	MH-3	MH-2	76.33	CIRCULAR	0.67	1.33 ft/s
C274	MH-2	J226	81.82	CIRCULAR	0.67	1.39 ft/s
C280	J276	J238	72	CIRCULAR	0.67	9.94 ft/s
C282	J278	J280	40	FORCE_MAIN	0.33	14.08 ft/s
C284	J280	J276	65	FORCE_MAIN	0.5	13.39 ft/s

Pump:



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Current (2025) PHF - Model Results

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	3/16/2026
Created By:	Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max d/D
C100	MH-55B	MH-54	125.65	CIRCULAR	0.67	0.04
C102	MH-54	MH-63	372.29	CIRCULAR	0.67	0.05
C104	MH-63	MH-35	361.74	CIRCULAR	0.67	0.05
C106	MH-34	MH-41	407.57	CIRCULAR	0.67	0.13
C108	MH-50	MH-52	152.44	CIRCULAR	0.67	0.07
C110	MH-52	MH-51	186.97	CIRCULAR	0.67	0.09
C112	MH-73	MH-72	145.02	CIRCULAR	0.67	0.05
C114	MH-72	MH-51	370.85	CIRCULAR	0.67	0.07
C116	MH-51	MH-48	358.95	CIRCULAR	0.67	0.09
C118	MH-48	MH-45	378.56	CIRCULAR	0.67	0.12
C120	MH-45	MH-42	212.02	CIRCULAR	0.67	0.14
C122	MH-42	MH-41	141.87	CIRCULAR	0.67	0.16
C124	MH-41	MH-40	213.04	CIRCULAR	0.67	0.18
C126	MH-40	MH-39	264.56	CIRCULAR	0.67	0.19
C128	MH-39	MH-38	364.69	CIRCULAR	0.67	0.2
C130	MH-38	MH-29	349.53	CIRCULAR	0.67	0.25
C132	MH-28	MH-27	364.16	CIRCULAR	0.67	0.05
C134	MH-27	MH-26	371.87	CIRCULAR	0.67	0.08
C136	MH-26	MH-25	368.38	CIRCULAR	0.67	0.09
C138	MH-25	MH-24	188.85	CIRCULAR	0.67	0.09
C140	MH-24	MH-29	184.81	CIRCULAR	0.67	0.2
C142	CO-3	MH-40	165.2	CIRCULAR	0.67	0.12
C148	CO-2	MH-40	128.84	CIRCULAR	0.67	0.11
C150	CO-1	MH-40	137.77	CIRCULAR	0.67	0.09
C152	MH-56	MH-46	235.36	CIRCULAR	0.67	0.06
C154	MH-46	MH-45	364.91	CIRCULAR	0.67	0.1
C156	MH-53	MH-47	226.67	CIRCULAR	0.67	0.04
C158	MH-49	MH-48	362.83	CIRCULAR	0.67	0.07
C160	MH-74	MH-48	323.52	CIRCULAR	0.67	0.08
C162	MH-60	MH-59	398.92	CIRCULAR	0.67	0.1
C164	MH-59	MH-58	203.06	CIRCULAR	0.67	0.1
C166	MH-58	MH-10	228.91	CIRCULAR	0.67	0.17
C168	MH-43	MH-42	367.88	CIRCULAR	0.67	0.11
C170	MH-32	MH-67	355.49	CIRCULAR	0.67	0.08
C172	MH-71	MH-70	181.67	CIRCULAR	0.67	0.06
C174	MH-70	MH-67	419.71	CIRCULAR	0.67	0.09
C176	MH-67	MH-55	388.27	CIRCULAR	0.67	0.12

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Current (2025) PHF - Model Results

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	3/16/2026
Created By:	Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max d/D
C178	MH-44	MH-37	243.91	CIRCULAR	0.67	0.06
C180	MH-55	MH-64	311.38	CIRCULAR	0.67	0.15
C182	MH-62	MH-11	221.62	CIRCULAR	0.67	0.2
C184	MH-66	MH-55	196.86	CIRCULAR	0.67	0.07
C186	MH-69	MH-68	145.91	CIRCULAR	0.67	0.03
C188	MH-75	MH-70	154.13	CIRCULAR	0.67	0.05
C190	MH-23	MH-22	332.31	CIRCULAR	0.67	0.01
C192	MH-22	MH-21	546.92	CIRCULAR	0.67	0.05
C194	MH-76	MH-21	315.86	CIRCULAR	0.67	0.06
C196	MH-21	MH-20	332.37	CIRCULAR	0.67	0.1
C198	MH-20	MH-19	507.86	CIRCULAR	0.67	0.13
C200	MH-19	MH-18	128.47	CIRCULAR	0.67	0.14
C202	MH-18B	MH-18	394.91	CIRCULAR	0.67	0.08
C204	MH-18	MH-17	408.45	CIRCULAR	0.67	0.14
C206	MH-30	MH-15	174.65	CIRCULAR	0.67	0.07
C208	MH-16	MH-15	375.57	CIRCULAR	0.67	0.14
C210	MH-15	MH-14	389.28	CIRCULAR	0.67	0.12
C212	MH-14	MH-13	260.67	CIRCULAR	0.67	0.12
C214	MH-13	MH-12	189.55	CIRCULAR	0.67	0.12
C216	MH-12	MH-11	272.85	CIRCULAR	0.67	0.17
C218	MH-11	MH-10	349.5	CIRCULAR	0.67	0.23
C220	MH-10	MH-29	356.12	CIRCULAR	0.67	0.27
C224	MH-29	MH-9	245.65	CIRCULAR	0.67	0.3
C226	MH-9	MH-8	399.29	CIRCULAR	0.67	0.3
C228	MH-7	MH-6	388.3	CIRCULAR	0.67	0.3
C230	MH-5	MH-4	377.19	CIRCULAR	0.67	0.3
C232	MH-4	MH-3	70.39	CIRCULAR	0.67	0.3
C234	MH-8	MH-7	329.58	CIRCULAR	0.67	0.3
C238	MH-64	MH-33	390.21	CIRCULAR	0.67	0.17
C240	MH-15	MH-64	351.09	CIRCULAR	0.67	0.14
C242	MH-17	MH-16	328.48	CIRCULAR	0.67	0.15
C244	MH-65	MH-71	288.6	CIRCULAR	0.67	0.05
C246	MH-31	MH-32	241.06	CIRCULAR	0.67	0.05

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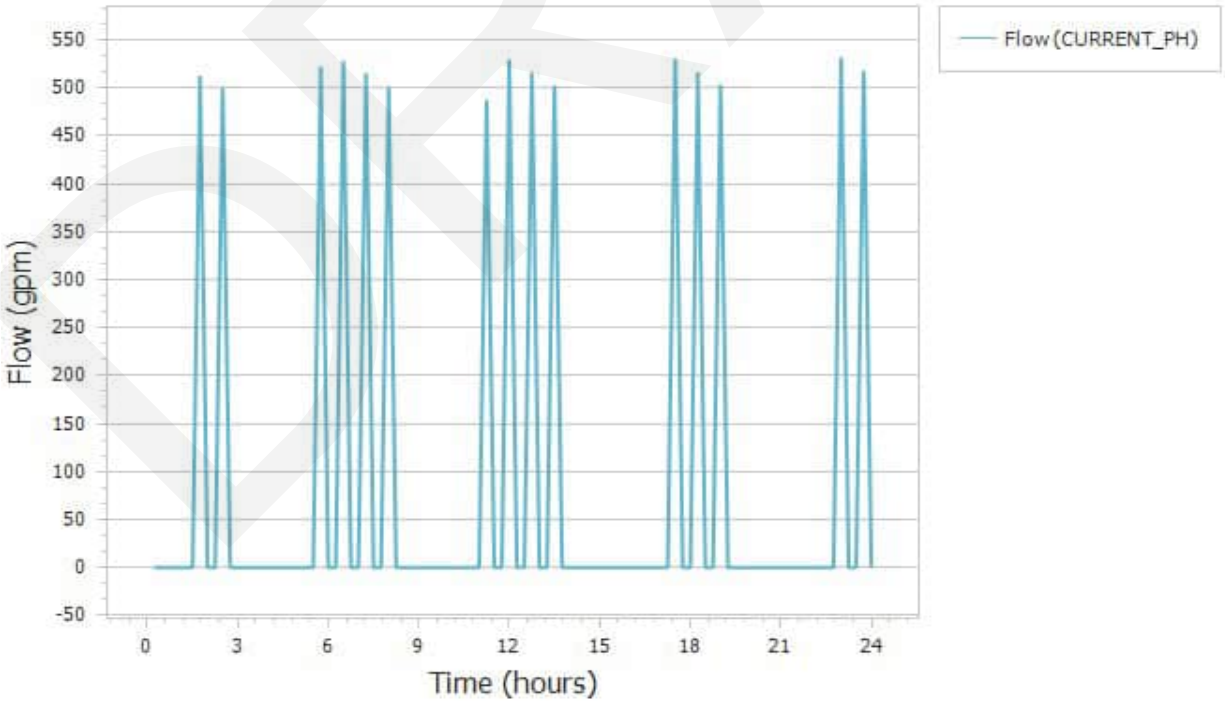
Current (2025) PHF - Model Results

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	3/16/2026
Created By:	Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max d/D
C248	MH-68	MH-67	310.22	CIRCULAR	0.67	0.08
C250	MH-37	MH-43	160.81	CIRCULAR	0.67	0.07
C252	MH-61	MH-60	297.33	CIRCULAR	0.67	0.08
C254	MH-33	MH-62	210.96	CIRCULAR	0.67	0.17
C256	MH-45B	MH-45	320.84	CIRCULAR	0.67	0.08
C260	MH-36	MH-34	391.95	CIRCULAR	0.67	0.09
C262	MH-35	MH-36	390.29	CIRCULAR	0.67	0.07
C264	MH-53	MH-56	375.05	CIRCULAR	0.67	0.04
C266	MH-47	MH-46	368.19	CIRCULAR	0.67	0.06
C268	MH-29B	MH-23	219.71	CIRCULAR	0.67	0
C270	MH-6	MH-5	340.75	CIRCULAR	0.67	0.3
C272	MH-3	MH-2	76.33	CIRCULAR	0.67	0.3
C274	MH-2	J226	81.82	CIRCULAR	0.67	0.3
C280	J276	J238	72	CIRCULAR	0.67	1
C282	J278	J280	40	FORCE_MAIN	0.33	1
C284	J280	J276	65	FORCE_MAIN	0.5	1

Pump:



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20-Year Future (2045) ADF - Model Results

Project: City of Tetonia WWFPS
Project Number: 16084
Last Revised on: 3/16/2026
Created By: Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max Velocity
C100	MH-55B	MH-54	125.65	CIRCULAR	0.67	0.27 ft/s
C102	MH-54	MH-63	372.29	CIRCULAR	0.67	0.37 ft/s
C104	MH-63	MH-35	361.74	CIRCULAR	0.67	0.4 ft/s
C106	MH-34	MH-41	407.57	CIRCULAR	0.67	0.48 ft/s
C108	MH-50	MH-52	152.44	CIRCULAR	0.67	0.32 ft/s
C110	MH-52	MH-51	186.97	CIRCULAR	0.67	0.2 ft/s
C112	MH-73	MH-72	145.02	CIRCULAR	0.67	0.33 ft/s
C114	MH-72	MH-51	370.85	CIRCULAR	0.67	0.43 ft/s
C116	MH-51	MH-48	358.95	CIRCULAR	0.67	0.49 ft/s
C118	MH-48	MH-45	378.56	CIRCULAR	0.67	0.5 ft/s
C120	MH-45	MH-42	212.02	CIRCULAR	0.67	0.61 ft/s
C122	MH-42	MH-41	141.87	CIRCULAR	0.67	0.65 ft/s
C124	MH-41	MH-40	213.04	CIRCULAR	0.67	0.78 ft/s
C126	MH-40	MH-39	264.56	CIRCULAR	0.67	0.85 ft/s
C128	MH-39	MH-38	364.69	CIRCULAR	0.67	0.86 ft/s
C130	MH-38	MH-29	349.53	CIRCULAR	0.67	0.65 ft/s
C132	MH-28	MH-27	364.16	CIRCULAR	0.67	0.16 ft/s
C134	MH-27	MH-26	371.87	CIRCULAR	0.67	0.4 ft/s
C136	MH-26	MH-25	368.38	CIRCULAR	0.67	0.53 ft/s
C138	MH-25	MH-24	188.85	CIRCULAR	0.67	0.52 ft/s
C140	MH-24	MH-29	184.81	CIRCULAR	0.67	0.42 ft/s
C142	CO-3	MH-40	165.2	CIRCULAR	0.67	0.41 ft/s
C148	CO-2	MH-40	128.84	CIRCULAR	0.67	0.12 ft/s
C150	CO-1	MH-40	137.77	CIRCULAR	0.67	0 ft/s
C152	MH-56	MH-46	235.36	CIRCULAR	0.67	0.31 ft/s
C154	MH-46	MH-45	364.91	CIRCULAR	0.67	0.38 ft/s
C156	MH-53	MH-47	226.67	CIRCULAR	0.67	0.48 ft/s
C158	MH-49	MH-48	362.83	CIRCULAR	0.67	0.36 ft/s
C160	MH-74	MH-48	323.52	CIRCULAR	0.67	0.52 ft/s
C162	MH-60	MH-59	398.92	CIRCULAR	0.67	0.63 ft/s
C164	MH-59	MH-58	203.06	CIRCULAR	0.67	0.53 ft/s
C166	MH-58	MH-10	228.91	CIRCULAR	0.67	0.57 ft/s
C168	MH-43	MH-42	367.88	CIRCULAR	0.67	0.5 ft/s
C170	MH-32	MH-67	355.49	CIRCULAR	0.67	0.24 ft/s
C172	MH-71	MH-70	181.67	CIRCULAR	0.67	0.41 ft/s
C174	MH-70	MH-67	419.71	CIRCULAR	0.67	0.3 ft/s
C176	MH-67	MH-55	388.27	CIRCULAR	0.67	0.55 ft/s

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20-Year Future (2045) ADF - Model Results

Project: City of Tetonia WWFPS
Project Number: 16084
Last Revised on: 3/16/2026
Created By: Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max Velocity
C178	MH-44	MH-37	243.91	CIRCULAR	0.67	0.41 ft/s
C180	MH-55	MH-64	311.38	CIRCULAR	0.67	0.54 ft/s
C182	MH-62	MH-11	221.62	CIRCULAR	0.67	0.73 ft/s
C184	MH-66	MH-55	196.86	CIRCULAR	0.67	0.8 ft/s
C186	MH-69	MH-68	145.91	CIRCULAR	0.67	0 ft/s
C188	MH-75	MH-70	154.13	CIRCULAR	0.67	0.35 ft/s
C190	MH-23	MH-22	332.31	CIRCULAR	0.67	0 ft/s
C192	MH-22	MH-21	546.92	CIRCULAR	0.67	0.11 ft/s
C194	MH-76	MH-21	315.86	CIRCULAR	0.67	0.38 ft/s
C196	MH-21	MH-20	332.37	CIRCULAR	0.67	0.25 ft/s
C198	MH-20	MH-19	507.86	CIRCULAR	0.67	0.75 ft/s
C200	MH-19	MH-18	128.47	CIRCULAR	0.67	0.72 ft/s
C202	MH-18B	MH-18	394.91	CIRCULAR	0.67	0.15 ft/s
C204	MH-18	MH-17	408.45	CIRCULAR	0.67	0.71 ft/s
C206	MH-30	MH-15	174.65	CIRCULAR	0.67	0.14 ft/s
C208	MH-16	MH-15	375.57	CIRCULAR	0.67	0.8 ft/s
C210	MH-15	MH-14	389.28	CIRCULAR	0.67	0.64 ft/s
C212	MH-14	MH-13	260.67	CIRCULAR	0.67	0.65 ft/s
C214	MH-13	MH-12	189.55	CIRCULAR	0.67	0.65 ft/s
C216	MH-12	MH-11	272.85	CIRCULAR	0.67	0.4 ft/s
C218	MH-11	MH-10	349.5	CIRCULAR	0.67	0.86 ft/s
C220	MH-10	MH-29	356.12	CIRCULAR	0.67	0.84 ft/s
C224	MH-29	MH-9	245.65	CIRCULAR	0.67	1.34 ft/s
C226	MH-9	MH-8	399.29	CIRCULAR	0.67	1.34 ft/s
C228	MH-7	MH-6	388.3	CIRCULAR	0.67	1.72 ft/s
C230	MH-5	MH-4	377.19	CIRCULAR	0.67	1.72 ft/s
C232	MH-4	MH-3	70.39	CIRCULAR	0.67	1.72 ft/s
C234	MH-8	MH-7	329.58	CIRCULAR	0.67	0.96 ft/s
C238	MH-64	MH-33	390.21	CIRCULAR	0.67	0.8 ft/s
C240	MH-15	MH-64	351.09	CIRCULAR	0.67	0.43 ft/s
C242	MH-17	MH-16	328.48	CIRCULAR	0.67	0.72 ft/s
C244	MH-65	MH-71	288.6	CIRCULAR	0.67	0.38 ft/s
C246	MH-31	MH-32	241.06	CIRCULAR	0.67	0.35 ft/s
C248	MH-68	MH-67	310.22	CIRCULAR	0.67	0.37 ft/s
C250	MH-37	MH-43	160.81	CIRCULAR	0.67	0.34 ft/s
C252	MH-61	MH-60	297.33	CIRCULAR	0.67	0.37 ft/s
C254	MH-33	MH-62	210.96	CIRCULAR	0.67	0.81 ft/s

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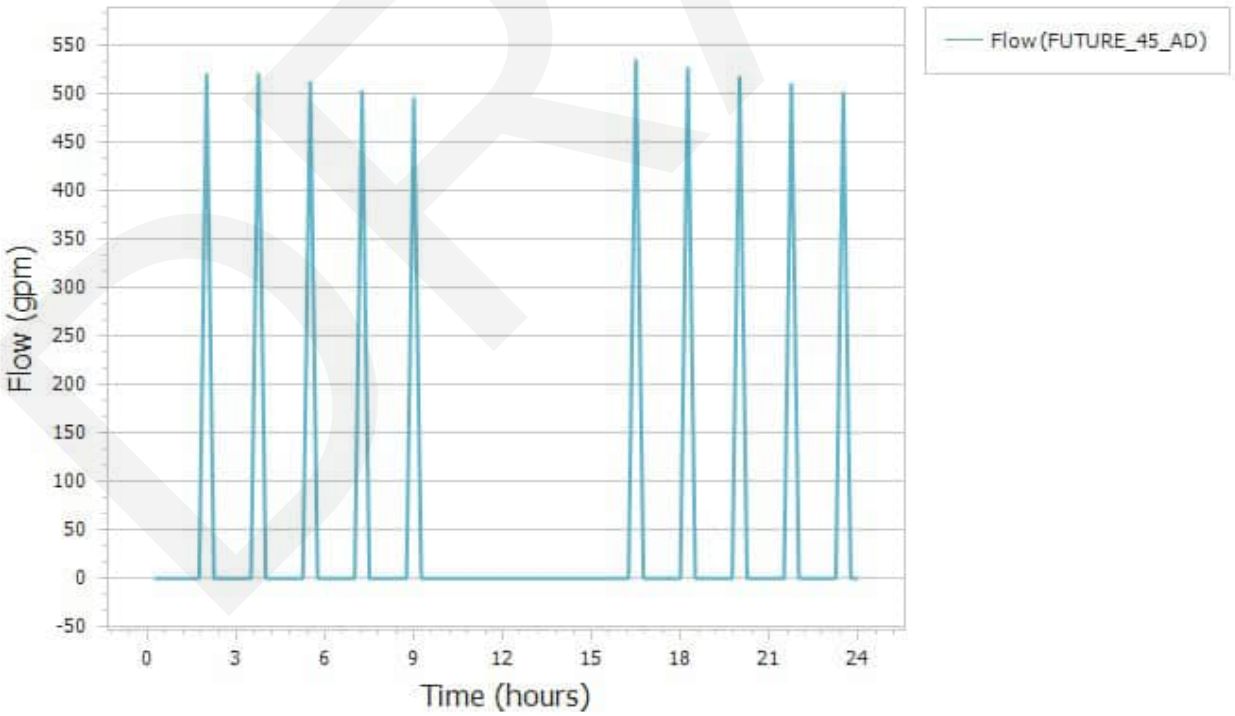
20-Year Future (2045) ADF - Model Results

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	3/16/2026
Created By:	Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max Velocity
C256	MH-45B	MH-45	320.84	CIRCULAR	0.67	0.31 ft/s
C258	FUTURE-2	FUTURE-1	397.1	CIRCULAR	0.67	1.73 ft/s
C260	MH-36	MH-34	391.95	CIRCULAR	0.67	0.44 ft/s
C262	MH-35	MH-36	390.29	CIRCULAR	0.67	0.36 ft/s
C264	MH-53	MH-56	375.05	CIRCULAR	0.67	0.36 ft/s
C266	MH-47	MH-46	368.19	CIRCULAR	0.67	0.25 ft/s
C268	MH-29B	MH-23	219.71	CIRCULAR	0.67	0 ft/s
C270	MH-6	MH-5	340.75	CIRCULAR	0.67	1.72 ft/s
C272	MH-3	MH-2	76.33	CIRCULAR	0.67	1.71 ft/s
C274	MH-2	J226	81.82	CIRCULAR	0.67	1.77 ft/s
C276	FUTURE-1	MH-7	399.51	CIRCULAR	0.67	1.59 ft/s
C280	J276	J238	72	CIRCULAR	0.67	9.94 ft/s
C282	J278	J280	40	FORCE_MAIN	0.33	14.08 ft/s
C284	J280	J276	65	FORCE_MAIN	0.5	13.39 ft/s

Pump:



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20-Year Future (2045) PHF - Model Results

Project: City of Tetonia WWFPS
Project Number: 16084
Last Revised on: 3/16/2026
Created By: Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max d/D
C100	MH-55B	MH-54	125.65	CIRCULAR	0.67	0.04
C102	MH-54	MH-63	372.29	CIRCULAR	0.67	0.05
C104	MH-63	MH-35	361.74	CIRCULAR	0.67	0.05
C106	MH-34	MH-41	407.57	CIRCULAR	0.67	0.13
C108	MH-50	MH-52	152.44	CIRCULAR	0.67	0.07
C110	MH-52	MH-51	186.97	CIRCULAR	0.67	0.09
C112	MH-73	MH-72	145.02	CIRCULAR	0.67	0.05
C114	MH-72	MH-51	370.85	CIRCULAR	0.67	0.07
C116	MH-51	MH-48	358.95	CIRCULAR	0.67	0.09
C118	MH-48	MH-45	378.56	CIRCULAR	0.67	0.12
C120	MH-45	MH-42	212.02	CIRCULAR	0.67	0.14
C122	MH-42	MH-41	141.87	CIRCULAR	0.67	0.16
C124	MH-41	MH-40	213.04	CIRCULAR	0.67	0.18
C126	MH-40	MH-39	264.56	CIRCULAR	0.67	0.19
C128	MH-39	MH-38	364.69	CIRCULAR	0.67	0.2
C130	MH-38	MH-29	349.53	CIRCULAR	0.67	0.25
C132	MH-28	MH-27	364.16	CIRCULAR	0.67	0.05
C134	MH-27	MH-26	371.87	CIRCULAR	0.67	0.08
C136	MH-26	MH-25	368.38	CIRCULAR	0.67	0.09
C138	MH-25	MH-24	188.85	CIRCULAR	0.67	0.09
C140	MH-24	MH-29	184.81	CIRCULAR	0.67	0.2
C142	CO-3	MH-40	165.2	CIRCULAR	0.67	0.12
C148	CO-2	MH-40	128.84	CIRCULAR	0.67	0.11
C150	CO-1	MH-40	137.77	CIRCULAR	0.67	0.09
C152	MH-56	MH-46	235.36	CIRCULAR	0.67	0.06
C154	MH-46	MH-45	364.91	CIRCULAR	0.67	0.1
C156	MH-53	MH-47	226.67	CIRCULAR	0.67	0.04
C158	MH-49	MH-48	362.83	CIRCULAR	0.67	0.07
C160	MH-74	MH-48	323.52	CIRCULAR	0.67	0.08
C162	MH-60	MH-59	398.92	CIRCULAR	0.67	0.1
C164	MH-59	MH-58	203.06	CIRCULAR	0.67	0.1
C166	MH-58	MH-10	228.91	CIRCULAR	0.67	0.17
C168	MH-43	MH-42	367.88	CIRCULAR	0.67	0.11
C170	MH-32	MH-67	355.49	CIRCULAR	0.67	0.08
C172	MH-71	MH-70	181.67	CIRCULAR	0.67	0.06
C174	MH-70	MH-67	419.71	CIRCULAR	0.67	0.09
C176	MH-67	MH-55	388.27	CIRCULAR	0.67	0.12

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20-Year Future (2045) PHF - Model Results

Project: City of Tetonia WWFPS
Project Number: 16084
Last Revised on: 3/16/2026
Created By: Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max d/D
C178	MH-44	MH-37	243.91	CIRCULAR	0.67	0.06
C180	MH-55	MH-64	311.38	CIRCULAR	0.67	0.15
C182	MH-62	MH-11	221.62	CIRCULAR	0.67	0.2
C184	MH-66	MH-55	196.86	CIRCULAR	0.67	0.07
C186	MH-69	MH-68	145.91	CIRCULAR	0.67	0.03
C188	MH-75	MH-70	154.13	CIRCULAR	0.67	0.05
C190	MH-23	MH-22	332.31	CIRCULAR	0.67	0.01
C192	MH-22	MH-21	546.92	CIRCULAR	0.67	0.05
C194	MH-76	MH-21	315.86	CIRCULAR	0.67	0.06
C196	MH-21	MH-20	332.37	CIRCULAR	0.67	0.1
C198	MH-20	MH-19	507.86	CIRCULAR	0.67	0.13
C200	MH-19	MH-18	128.47	CIRCULAR	0.67	0.14
C202	MH-18B	MH-18	394.91	CIRCULAR	0.67	0.08
C204	MH-18	MH-17	408.45	CIRCULAR	0.67	0.14
C206	MH-30	MH-15	174.65	CIRCULAR	0.67	0.07
C208	MH-16	MH-15	375.57	CIRCULAR	0.67	0.14
C210	MH-15	MH-14	389.28	CIRCULAR	0.67	0.12
C212	MH-14	MH-13	260.67	CIRCULAR	0.67	0.12
C214	MH-13	MH-12	189.55	CIRCULAR	0.67	0.12
C216	MH-12	MH-11	272.85	CIRCULAR	0.67	0.17
C218	MH-11	MH-10	349.5	CIRCULAR	0.67	0.23
C220	MH-10	MH-29	356.12	CIRCULAR	0.67	0.27
C224	MH-29	MH-9	245.65	CIRCULAR	0.67	0.3
C226	MH-9	MH-8	399.29	CIRCULAR	0.67	0.3
C228	MH-7	MH-6	388.3	CIRCULAR	0.67	0.48
C230	MH-5	MH-4	377.19	CIRCULAR	0.67	0.48
C232	MH-4	MH-3	70.39	CIRCULAR	0.67	0.48
C234	MH-8	MH-7	329.58	CIRCULAR	0.67	0.39
C238	MH-64	MH-33	390.21	CIRCULAR	0.67	0.17
C240	MH-15	MH-64	351.09	CIRCULAR	0.67	0.14
C242	MH-17	MH-16	328.48	CIRCULAR	0.67	0.15
C244	MH-65	MH-71	288.6	CIRCULAR	0.67	0.05
C246	MH-31	MH-32	241.06	CIRCULAR	0.67	0.05
C248	MH-68	MH-67	310.22	CIRCULAR	0.67	0.08
C250	MH-37	MH-43	160.81	CIRCULAR	0.67	0.07
C252	MH-61	MH-60	297.33	CIRCULAR	0.67	0.08
C254	MH-33	MH-62	210.96	CIRCULAR	0.67	0.17

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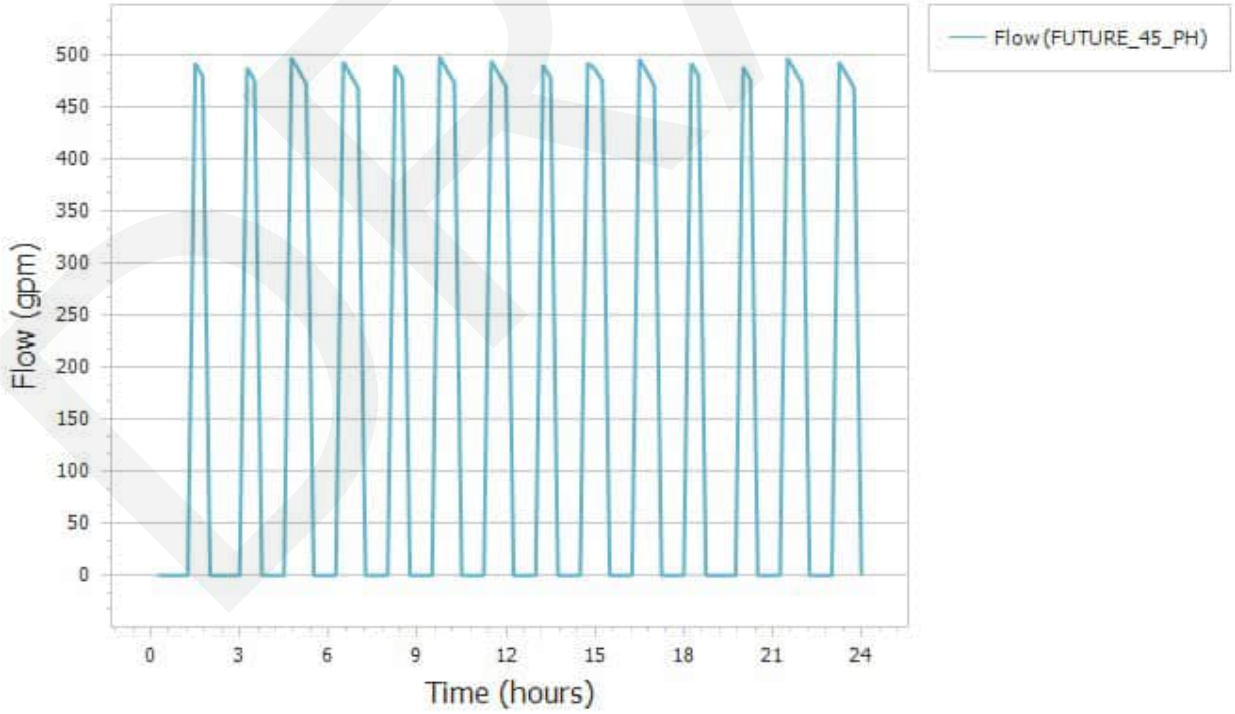
20-Year Future (2045) PHF - Model Results

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	3/16/2026
Created By:	Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max d/D
C256	MH-45B	MH-45	320.84	CIRCULAR	0.67	0.08
C258	FUTURE-2	FUTURE-1	397.1	CIRCULAR	0.67	0.4
C260	MH-36	MH-34	391.95	CIRCULAR	0.67	0.09
C262	MH-35	MH-36	390.29	CIRCULAR	0.67	0.07
C264	MH-53	MH-56	375.05	CIRCULAR	0.67	0.04
C266	MH-47	MH-46	368.19	CIRCULAR	0.67	0.06
C268	MH-29B	MH-23	219.71	CIRCULAR	0.67	0
C270	MH-6	MH-5	340.75	CIRCULAR	0.67	0.48
C272	MH-3	MH-2	76.33	CIRCULAR	0.67	0.48
C274	MH-2	J226	81.82	CIRCULAR	0.67	0.47
C276	FUTURE-1	MH-7	399.51	CIRCULAR	0.67	0.43
C280	J276	J238	72	CIRCULAR	0.67	1
C282	J278	J280	105	FORCE_MAIN	0.33	1
C284	J280	J276	65	FORCE_MAIN	0.5	1

Pump:



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40-Year Future (2065) ADF - Model Results

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	3/16/2026
Created By:	Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max Velocity
C100	MH-55B	MH-54	125.65	CIRCULAR	0.67	0.27 ft/s
C102	MH-54	MH-63	372.29	CIRCULAR	0.67	0.37 ft/s
C104	MH-63	MH-35	361.74	CIRCULAR	0.67	0.4 ft/s
C106	MH-34	MH-41	407.57	CIRCULAR	0.67	0.48 ft/s
C108	MH-50	MH-52	152.44	CIRCULAR	0.67	0.32 ft/s
C110	MH-52	MH-51	186.97	CIRCULAR	0.67	0.2 ft/s
C112	MH-73	MH-72	145.02	CIRCULAR	0.67	0.33 ft/s
C114	MH-72	MH-51	370.85	CIRCULAR	0.67	0.43 ft/s
C116	MH-51	MH-48	358.95	CIRCULAR	0.67	0.49 ft/s
C118	MH-48	MH-45	378.56	CIRCULAR	0.67	0.5 ft/s
C120	MH-45	MH-42	212.02	CIRCULAR	0.67	0.61 ft/s
C122	MH-42	MH-41	141.87	CIRCULAR	0.67	0.65 ft/s
C124	MH-41	MH-40	213.04	CIRCULAR	0.67	0.78 ft/s
C126	MH-40	MH-39	264.56	CIRCULAR	0.67	0.85 ft/s
C128	MH-39	MH-38	364.69	CIRCULAR	0.67	0.86 ft/s
C130	MH-38	MH-29	349.53	CIRCULAR	0.67	0.65 ft/s
C132	MH-28	MH-27	364.16	CIRCULAR	0.67	0.16 ft/s
C134	MH-27	MH-26	371.87	CIRCULAR	0.67	0.4 ft/s
C136	MH-26	MH-25	368.38	CIRCULAR	0.67	0.53 ft/s
C138	MH-25	MH-24	188.85	CIRCULAR	0.67	0.52 ft/s
C140	MH-24	MH-29	184.81	CIRCULAR	0.67	0.42 ft/s
C142	CO-3	MH-40	165.2	CIRCULAR	0.67	0.41 ft/s
C148	CO-2	MH-40	128.84	CIRCULAR	0.67	0.12 ft/s
C150	CO-1	MH-40	137.77	CIRCULAR	0.67	0 ft/s
C152	MH-56	MH-46	235.36	CIRCULAR	0.67	0.31 ft/s
C154	MH-46	MH-45	364.91	CIRCULAR	0.67	0.38 ft/s
C156	MH-53	MH-47	226.67	CIRCULAR	0.67	0.48 ft/s
C158	MH-49	MH-48	362.83	CIRCULAR	0.67	0.36 ft/s
C160	MH-74	MH-48	323.52	CIRCULAR	0.67	0.52 ft/s
C162	MH-60	MH-59	398.92	CIRCULAR	0.67	0.63 ft/s
C164	MH-59	MH-58	203.06	CIRCULAR	0.67	0.53 ft/s
C166	MH-58	MH-10	228.91	CIRCULAR	0.67	0.57 ft/s
C168	MH-43	MH-42	367.88	CIRCULAR	0.67	0.5 ft/s
C170	MH-32	MH-67	355.49	CIRCULAR	0.67	0.24 ft/s
C172	MH-71	MH-70	181.67	CIRCULAR	0.67	0.41 ft/s
C174	MH-70	MH-67	419.71	CIRCULAR	0.67	0.3 ft/s
C176	MH-67	MH-55	388.27	CIRCULAR	0.67	0.55 ft/s

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40-Year Future (2065) ADF - Model Results

Project: City of Tetonia WWFPS
Project Number: 16084
Last Revised on: 3/16/2026
Created By: Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max Velocity
C178	MH-44	MH-37	243.91	CIRCULAR	0.67	0.41 ft/s
C180	MH-55	MH-64	311.38	CIRCULAR	0.67	0.54 ft/s
C182	MH-62	MH-11	221.62	CIRCULAR	0.67	0.73 ft/s
C184	MH-66	MH-55	196.86	CIRCULAR	0.67	0.8 ft/s
C186	MH-69	MH-68	145.91	CIRCULAR	0.67	0 ft/s
C188	MH-75	MH-70	154.13	CIRCULAR	0.67	0.35 ft/s
C190	MH-23	MH-22	332.31	CIRCULAR	0.67	0 ft/s
C192	MH-22	MH-21	546.92	CIRCULAR	0.67	0.11 ft/s
C194	MH-76	MH-21	315.86	CIRCULAR	0.67	0.38 ft/s
C196	MH-21	MH-20	332.37	CIRCULAR	0.67	0.25 ft/s
C198	MH-20	MH-19	507.86	CIRCULAR	0.67	0.75 ft/s
C200	MH-19	MH-18	128.47	CIRCULAR	0.67	0.72 ft/s
C202	MH-18B	MH-18	394.91	CIRCULAR	0.67	0.15 ft/s
C204	MH-18	MH-17	408.45	CIRCULAR	0.67	0.71 ft/s
C206	MH-30	MH-15	174.65	CIRCULAR	0.67	0.14 ft/s
C208	MH-16	MH-15	375.57	CIRCULAR	0.67	0.8 ft/s
C210	MH-15	MH-14	389.28	CIRCULAR	0.67	0.64 ft/s
C212	MH-14	MH-13	260.67	CIRCULAR	0.67	0.65 ft/s
C214	MH-13	MH-12	189.55	CIRCULAR	0.67	0.65 ft/s
C216	MH-12	MH-11	272.85	CIRCULAR	0.67	0.4 ft/s
C218	MH-11	MH-10	349.5	CIRCULAR	0.67	0.86 ft/s
C220	MH-10	MH-29	356.12	CIRCULAR	0.67	0.84 ft/s
C224	MH-29	MH-9	245.65	CIRCULAR	0.67	1.34 ft/s
C226	MH-9	MH-8	399.29	CIRCULAR	0.67	1.34 ft/s
C228	MH-7	MH-6	388.3	CIRCULAR	0.67	2.04 ft/s
C230	MH-5	MH-4	377.19	CIRCULAR	0.67	2.04 ft/s
C232	MH-4	MH-3	70.39	CIRCULAR	0.67	2.04 ft/s
C234	MH-8	MH-7	329.58	CIRCULAR	0.67	0.73 ft/s
C238	MH-64	MH-33	390.21	CIRCULAR	0.67	0.8 ft/s
C240	MH-15	MH-64	351.09	CIRCULAR	0.67	0.43 ft/s
C242	MH-17	MH-16	328.48	CIRCULAR	0.67	0.72 ft/s
C244	MH-65	MH-71	288.6	CIRCULAR	0.67	0.38 ft/s
C246	MH-31	MH-32	241.06	CIRCULAR	0.67	0.35 ft/s
C248	MH-68	MH-67	310.22	CIRCULAR	0.67	0.37 ft/s
C250	MH-37	MH-43	160.81	CIRCULAR	0.67	0.34 ft/s
C252	MH-61	MH-60	297.33	CIRCULAR	0.67	0.37 ft/s
C254	MH-33	MH-62	210.96	CIRCULAR	0.67	0.81 ft/s

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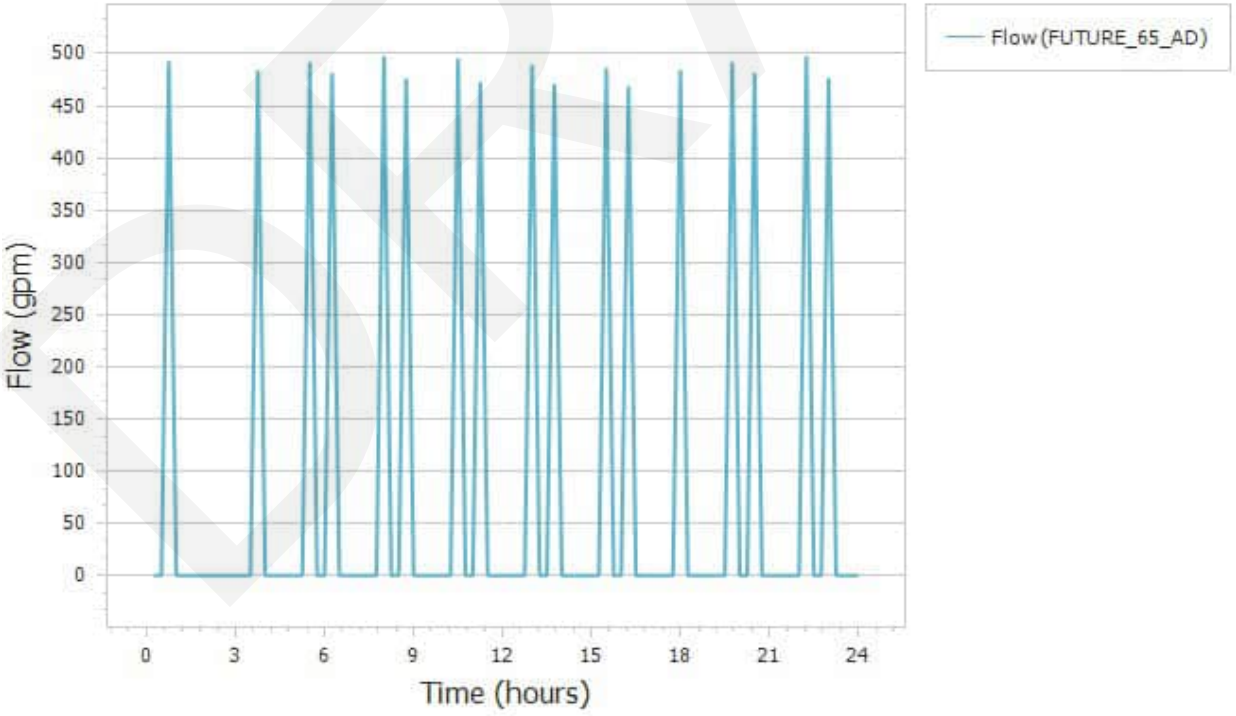
40-Year Future (2065) ADF - Model Results

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	3/16/2026
Created By:	Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max Velocity
C256	MH-45B	MH-45	320.84	CIRCULAR	0.67	0.31 ft/s
C258	FUTURE-2	FUTURE-1	397.1	CIRCULAR	0.67	2.23 ft/s
C260	MH-36	MH-34	391.95	CIRCULAR	0.67	0.44 ft/s
C262	MH-35	MH-36	390.29	CIRCULAR	0.67	0.36 ft/s
C264	MH-53	MH-56	375.05	CIRCULAR	0.67	0.36 ft/s
C266	MH-47	MH-46	368.19	CIRCULAR	0.67	0.25 ft/s
C268	MH-29B	MH-23	219.71	CIRCULAR	0.67	0 ft/s
C270	MH-6	MH-5	340.75	CIRCULAR	0.67	2.04 ft/s
C272	MH-3	MH-2	76.33	CIRCULAR	0.67	2.03 ft/s
C274	MH-2	J226	81.82	CIRCULAR	0.67	2.09 ft/s
C276	FUTURE-1	MH-7	399.51	CIRCULAR	0.67	2.06 ft/s
C280	J276	J238	72	CIRCULAR	0.67	9.94 ft/s
C282	J278	J280	105	FORCE_MAIN	0.33	12.98 ft/s
C284	J280	J276	65	FORCE_MAIN	0.5	14.55 ft/s

Pump:



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40-Year Future (2065) PHF - Model Results

Project:	City of Tetonia WWFPS
Project Number:	16084
Last Revised on:	3/16/2026
Created By:	Laura Radke, PE

Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max d/D
C100	MH-55B	MH-54	125.65	CIRCULAR	0.67	0.04
C102	MH-54	MH-63	372.29	CIRCULAR	0.67	0.05
C104	MH-63	MH-35	361.74	CIRCULAR	0.67	0.05
C106	MH-34	MH-41	407.57	CIRCULAR	0.67	0.13
C108	MH-50	MH-52	152.44	CIRCULAR	0.67	0.07
C110	MH-52	MH-51	186.97	CIRCULAR	0.67	0.09
C112	MH-73	MH-72	145.02	CIRCULAR	0.67	0.05
C114	MH-72	MH-51	370.85	CIRCULAR	0.67	0.07
C116	MH-51	MH-48	358.95	CIRCULAR	0.67	0.09
C118	MH-48	MH-45	378.56	CIRCULAR	0.67	0.12
C120	MH-45	MH-42	212.02	CIRCULAR	0.67	0.14
C122	MH-42	MH-41	141.87	CIRCULAR	0.67	0.16
C124	MH-41	MH-40	213.04	CIRCULAR	0.67	0.18
C126	MH-40	MH-39	264.56	CIRCULAR	0.67	0.19
C128	MH-39	MH-38	364.69	CIRCULAR	0.67	0.2
C130	MH-38	MH-29	349.53	CIRCULAR	0.67	0.25
C132	MH-28	MH-27	364.16	CIRCULAR	0.67	0.05
C134	MH-27	MH-26	371.87	CIRCULAR	0.67	0.08
C136	MH-26	MH-25	368.38	CIRCULAR	0.67	0.09
C138	MH-25	MH-24	188.85	CIRCULAR	0.67	0.09
C140	MH-24	MH-29	184.81	CIRCULAR	0.67	0.2
C142	CO-3	MH-40	165.2	CIRCULAR	0.67	0.12
C148	CO-2	MH-40	128.84	CIRCULAR	0.67	0.11
C150	CO-1	MH-40	137.77	CIRCULAR	0.67	0.09
C152	MH-56	MH-46	235.36	CIRCULAR	0.67	0.06
C154	MH-46	MH-45	364.91	CIRCULAR	0.67	0.1
C156	MH-53	MH-47	226.67	CIRCULAR	0.67	0.04
C158	MH-49	MH-48	362.83	CIRCULAR	0.67	0.07
C160	MH-74	MH-48	323.52	CIRCULAR	0.67	0.08
C162	MH-60	MH-59	398.92	CIRCULAR	0.67	0.1
C164	MH-59	MH-58	203.06	CIRCULAR	0.67	0.1
C166	MH-58	MH-10	228.91	CIRCULAR	0.67	0.17
C168	MH-43	MH-42	367.88	CIRCULAR	0.67	0.11
C170	MH-32	MH-67	355.49	CIRCULAR	0.67	0.08
C172	MH-71	MH-70	181.67	CIRCULAR	0.67	0.06
C174	MH-70	MH-67	419.71	CIRCULAR	0.67	0.09
C176	MH-67	MH-55	388.27	CIRCULAR	0.67	0.12

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40-Year Future (2065) PHF - Model Results

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Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max d/D
C178	MH-44	MH-37	243.91	CIRCULAR	0.67	0.06
C180	MH-55	MH-64	311.38	CIRCULAR	0.67	0.15
C182	MH-62	MH-11	221.62	CIRCULAR	0.67	0.2
C184	MH-66	MH-55	196.86	CIRCULAR	0.67	0.07
C186	MH-69	MH-68	145.91	CIRCULAR	0.67	0.03
C188	MH-75	MH-70	154.13	CIRCULAR	0.67	0.05
C190	MH-23	MH-22	332.31	CIRCULAR	0.67	0.01
C192	MH-22	MH-21	546.92	CIRCULAR	0.67	0.05
C194	MH-76	MH-21	315.86	CIRCULAR	0.67	0.06
C196	MH-21	MH-20	332.37	CIRCULAR	0.67	0.1
C198	MH-20	MH-19	507.86	CIRCULAR	0.67	0.13
C200	MH-19	MH-18	128.47	CIRCULAR	0.67	0.14
C202	MH-18B	MH-18	394.91	CIRCULAR	0.67	0.08
C204	MH-18	MH-17	408.45	CIRCULAR	0.67	0.14
C206	MH-30	MH-15	174.65	CIRCULAR	0.67	0.07
C208	MH-16	MH-15	375.57	CIRCULAR	0.67	0.14
C210	MH-15	MH-14	389.28	CIRCULAR	0.67	0.12
C212	MH-14	MH-13	260.67	CIRCULAR	0.67	0.12
C214	MH-13	MH-12	189.55	CIRCULAR	0.67	0.12
C216	MH-12	MH-11	272.85	CIRCULAR	0.67	0.17
C218	MH-11	MH-10	349.5	CIRCULAR	0.67	0.23
C220	MH-10	MH-29	356.12	CIRCULAR	0.67	0.27
C224	MH-29	MH-9	245.65	CIRCULAR	0.67	0.3
C226	MH-9	MH-8	399.29	CIRCULAR	0.67	0.3
C228	MH-7	MH-6	388.3	CIRCULAR	0.67	0.7
C230	MH-5	MH-4	377.19	CIRCULAR	0.67	0.7
C232	MH-4	MH-3	70.39	CIRCULAR	0.67	0.7
C234	MH-8	MH-7	329.58	CIRCULAR	0.67	0.5
C238	MH-64	MH-33	390.21	CIRCULAR	0.67	0.17
C240	MH-15	MH-64	351.09	CIRCULAR	0.67	0.14
C242	MH-17	MH-16	328.48	CIRCULAR	0.67	0.15
C244	MH-65	MH-71	288.6	CIRCULAR	0.67	0.05
C246	MH-31	MH-32	241.06	CIRCULAR	0.67	0.05
C248	MH-68	MH-67	310.22	CIRCULAR	0.67	0.08
C250	MH-37	MH-43	160.81	CIRCULAR	0.67	0.07
C252	MH-61	MH-60	297.33	CIRCULAR	0.67	0.08
C254	MH-33	MH-62	210.96	CIRCULAR	0.67	0.17

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40-Year Future (2065) PHF - Model Results

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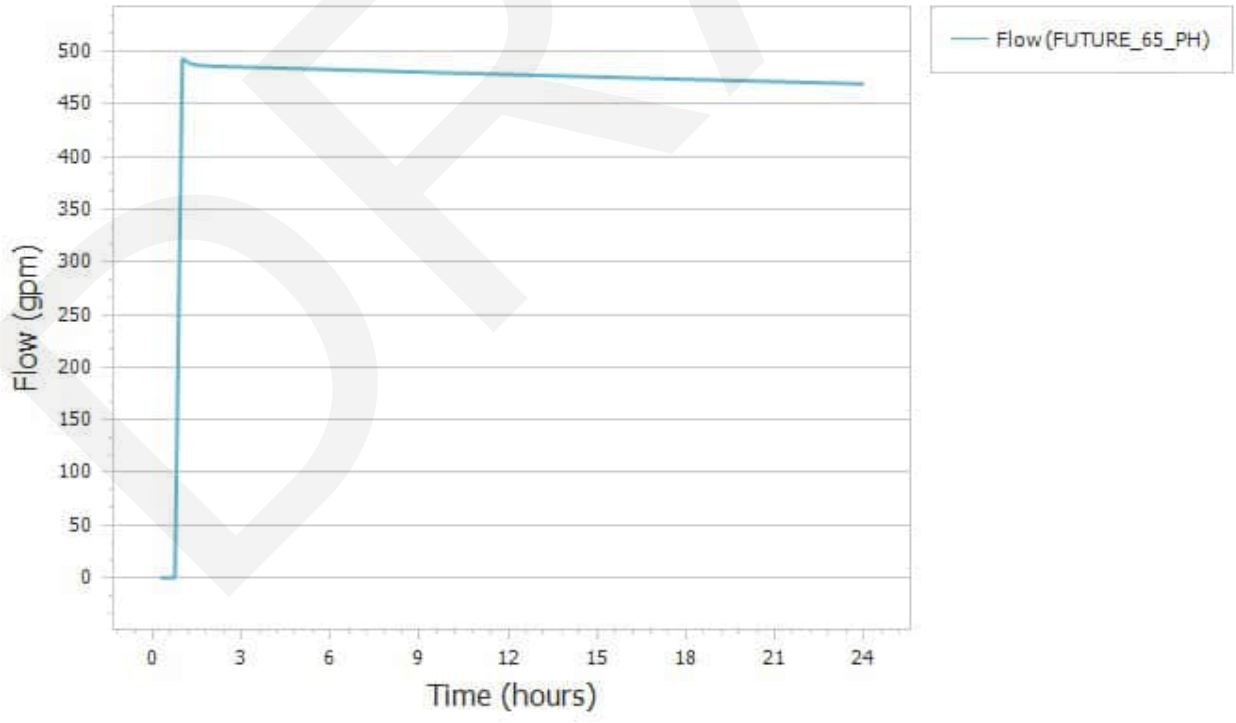
Conduits:

Conduit ID	From	To	Length	Conduit Shape	Max. Depth (Diameter)	Max d/D
C256	MH-45B	MH-45	320.84	CIRCULAR	0.67	0.08
C258	FUTURE-2	FUTURE-1	397.1	CIRCULAR	0.67	0.67
C260	MH-36	MH-34	391.95	CIRCULAR	0.67	0.09
C262	MH-35	MH-36	390.29	CIRCULAR	0.67	0.07
C264	MH-53	MH-56	375.05	CIRCULAR	0.67	0.04
C266	MH-47	MH-46	368.19	CIRCULAR	0.67	0.06
C268	MH-29B	MH-23	219.71	CIRCULAR	0.67	0
C270	MH-6	MH-5	340.75	CIRCULAR	0.67	0.7
C272	MH-3	MH-2	76.33	CIRCULAR	0.67	0.7
C274	MH-2	J226	81.82	CIRCULAR	0.67	0.65
C276	FUTURE-1	MH-7	399.51	CIRCULAR	0.67	0.67
C280	J276	J238	72	CIRCULAR	0.67	1
C282	J278	J280	105	FORCE_MAIN	0.33	1
C284	J280	J276	65	FORCE_MAIN	0.5	1

Pump:



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