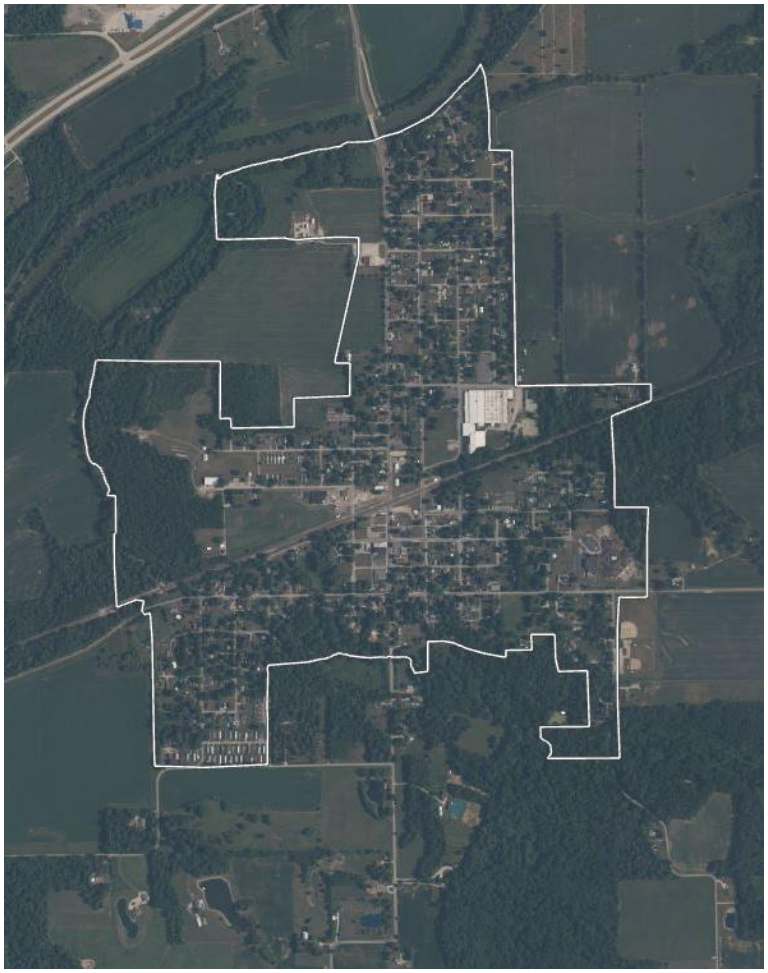
TOWN OF ANDREWS

DRINKING WATER PRELIMINARY ENGINEERING REPORT

REPORT COVER - DATE: APRIL 18, 2022



AME CONSULTING

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Definitions

BOD	Biochemical Oxygen Demand (BOD) is the measurement of the amount of oxygen required by bacteria for stabilizing material that can be decomposed under aerobic conditions. BOD is a commonly used determinate of the organic strength of a waste.
Combined Sewage	refers to a combination of wastewater (including domestic, commercial, or industrial wastewater) and storm water transported in a combined sewer or combined sewer system.
Combined Sewer	means a sewer that is designed, constructed, and used to receive and transport combined sewage.
Combined Sewer Operational Plan	means a plan that contains the minimum technology controls applicable to, and requirements for operation and maintenance of a combined sewer system.
Combined Sewer System	means a system of combined sewers that: (1) is designed, constructed, and used to receive and transport combined sewage to a publicly owned wastewater treatment plant; and (2) may contain one or more overflow points that discharge combined sewage entering the publicly owned wastewater treatment works when the hydraulic capacity of the system or part of the system is exceeded because of a wet weather event.
Effluent	Partially or fully treated wastewater flowing from a treatment unit or facility
First Flush	means the transport of solids in a combined sewer system that: (1) have settled in pipes during periods between wet-weather events: and (2) have washed off impermeable surfaces such as streets and parking lots during the beginning of a wet-weather event.
Hydraulic Model	means a technically acceptable method for assessing the hydraulic response of systems or networks.
Long Term Control Plan	means a plan that is consistent with the federal Combined Sewer Overflow Control Policy (59 Fed. Reg. 18688); Is developed in accordance with recommendations set forth in Combined Sewer Overflows Guidance for Long Term Control Plan (EPA 832B95002); Describes changes and improvements to be made to a combined sewer system or to a publicly owned wastewater treatment plant for the purpose of meeting the

	requirements of the federal Clean Water Act and state law; and Is developed with public participation using a process that is designed to promote active involvement by the affected public, through opportunities to provide in the decision making to select long term control alternatives. After approval, this document may contain the commitments from the community to the State of Indiana related to mitigating their CSO volume and events in an agreed upon timeframe.
Sludge	he primary organic solid or semi-solid material resulting from onsite wastewater treatment processes, also referred to as biosolids.
Total Suspended Solids (TSS)	A measure of the number of suspended solids found in water.
VOC	Volatile Organic Compound
Wet-Weather Event	means storm water runoff, snowmelt runoff, or ice-melt runoff entering a combined sewer system.

List of Acronyms

BMPs	Best Management Practices
BOD5	5-day Biochemical Oxygen Demand
CBOD5	5-day Carbonaceous Biochemical Oxygen Demand
CDBG	Community Development Block Grant
CFF	Community Focus Fund
cfs	Cubic Feet per Second
CSO	Combined Sewer Overflow
CSOOP	Combined Sewer Overflow Operational Plan
CSOs	Combined Sewer Overflows
CSS	Combined Sewer System
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DWO	Dry-Weather Overflow
DWSRF	Drinking Water State Revolving Fund
E. coli	Escherichia coli
EDU	Equivalent Dwelling Unit
ER	Environmental Review
Fed. Reg.	Federal Register
GI	Green Infrastructure
gph	Gallons per Hour
gpm	Gallons per Minute
IDEM	Indiana Deportment of Environmental Management
IDNR	Indiana Department of Natural Resources
I/I	Inflow and Infiltration
INDOT	Indiana Deportment of Transportation
Lbs	Pounds
LTCP	Long Term Control Plan
mg/I	Milligrams per Liter
MGD	Million Gallons per Day
MHI	Median Household Income
MRO	Monthly Report of Operation
NPDES	National Pollutant Discharge Elimination System
O, M & R	Operations, Maintenance and Replacement
ONRW	Outstanding National Resource Waters
OSRW	Outstanding State Resource Waters
PER	Preliminary Engineering Report
POTW	Publicly Owned Treatment Works

PVC	Polyvinyl-chloride Pipe
Q7,10	7-Day, l 0-year lowest flow period
RCP	Reinforced Concrete Pipe
RUS	Rural Utilities Service
SRF	State Revolving Fund
SSO	Sanitary Sewer Overflow
SUO	Sanitary Use Ordinance
SWMM	Storm Water Management Model
TDH	Total Dynamic Head
TSS	Total Suspended Solids
USDA RD	United States Department of Agriculture - Rural Development
USEPA	U.S. Environmental Protection Agency
WIPC	Water Infrastructure Planning Committee
WWSRF	Wastewater State Revolving Fund
WWTP	Wastewater Treatment Plant

Chapter 1 - EXECUTIVE SUMMARY

1.1 Purpose of the plan

The purpose of this planning study is to evaluate the current drinking water system in the Town of Andrews and create a reasonable solution for the issues that the current systems have or may have in the 20-year planning period. These current and anticipated issues include:

- Environmental contamination in the groundwater requiring a new water source aquifer,
- Drinking water treatment process improvements or replacements,
- Drinking water distribution system improvements for known flow, pressure, and water loss issues,

The plan was developed between January 2021 and April 2022 in part as response to the near-term needs for the Town through that period of time. The development of the plan included town council members, clerk-treasurer, and town utility staff.

The recommendations found in this plan are to be used to provide guidance to the Town to improve their drinking water system, seek funding, and implement the improvements.

1.2 Scope of the Drinking Water Plan

The Town of Andrews entered into an agreement with AME Consulting, LLC to prepare a report that evaluates the Town of Andrews drinking water system, presents alternatives, and makes a recommendation for needed improvements. The Preliminary Engineering Report evaluates the current drinking water system and recommends the necessary improvements to these systems and aids the town in seeking funding for those improvements through the Indiana State Revolving Loan Fund. Due to increased federal funding in 2022, we anticipate an opportunity for grant funds to also be awarded by the Indiana SRF program.

The capital costs for large utility projects are significant for a small community like Andrews, and it's important to take advantage of any and all funding options to result in the most affordable user rate at the end of the project.

The scope of this plan will evaluate the operational sustainability and project service needs of the drinking water system. Current and anticipated problems with the system will be identified and plans will be proposed to address these issues. Alternative plans will be evaluated for effectiveness, feasibility, and sustainability. Known issues with the system include contaminated ground water as our raw water source aquifer, water quality complaints, aging infrastructure, undersized watermains with pressure issues, and water treatment plant reliability.

1.3 Plan Summary

The following is a summary of the recommended solutions for the drinking water issues.

1.3.1 Drinking Water Summary

It is recommended that the town make improvements that include a new water treatment plant located south of town, relocation due to the groundwater contamination at the existing well field location and a new water treatment plant due to the age of the existing facilities, and modern innovations in treatment technologies. The new water treatment plant location is in an entirely separate aquifer from the existing aquifer that has been compromised by VOC pollution.

The new treatment plant will incorporate gravity filters within a packaged aeration, detention, and filtration unit. The latest in drinking water technology will be incorporated with updated controls, backwashing, inspection access, and opportunities for easier operations and maintenance.

Lastly, the distribution system should have its highest priority watermains replaced now to improve flow, pressure, color, taste, and odor issues as well as reducing the routine watermain breaks that are occurring. The selected plan is summarized below:

Table 1.1

Drinking Water Improvements Cost Summary

New Water Treatment Plant	$4,045,375
New Watermain Extension from Plant to Town	$1,070,625
Land Acquisition – New Water Plant Site	$80,000
Land Acquisition – Professional Services	$50,000
Easement Budget	$50,000
Test Wells	$160,000
Total	$5,456,000

1.4 Outline of Key Goals, Strategies and Desired Outcomes

The desired outcome of this plan is for the Town of Andrews is to have safe and efficient drinking water system. The strategy for achieving this outcome is to evaluate the current system and record its needs while also considering future needs of the system. The capital costs are anticipated to be very high for a small community like Andrews, this study will allow for pursuits of low-interest loans and grants through the Indiana State Revolving Loan Fund.

1.4.1 Drinking Water - Key Goals

1. Provide a system that can produce safe and reliable drinking water. Safe and reliable drinking water is water that can be delivered to the user and is safe for drinking, food preparation, personal hygiene and washing. Reliability always includes consistent availability. (Measurables: Eliminate risk from environmental groundwater contamination).
    a. Goal: Obtain water from a different water source aquifer without concerns related to contamination/pollution.
2. Address water plant production reliability issues which specifically includes replacement of filters that are beyond their useful life
    a. Goal: New water treatment process/filters
3. Improve distribution system flow and pressure issues.
    a. Provide distribution system improvements in priority areas.
    b. Prepare a set of long-range goals for further distribution system improvements.
4. Improve water loss by distribution system improvements
    a. Replace oldest watermains and suspects where water loss is the worst.
5. Apply for funding of recommended improvements as soon as possible to take advantage of grant funding opportunities necessary for these improvements.

Chapter 2 - GENERAL BACKGROUND

2.1 Introduction

This Drinking Water Plan has been prepared for the town by AME Consulting Engineers. The purpose of this study is to evaluate the existing facilities, review the projected growth for Andrews, identify challenges, evaluate alternatives, and recommend solutions.

2.2 Location

The Town is located on the western side of Huntington County, approximately 30 miles southwest of downtown Fort Wayne, 5 miles west of Huntington, and 12 miles east of Wabash.

The existing service area is entirely in Dallas Township (Township) in Huntington County. The entire existing system is contained within the Andrews Quadrangle. The system serves customers in portions of five sections within Township 28 North and Range 8 East. The sections served include portions of Sections 23, 26, 33, and 34.

The proposed area of study, and the existing service area relating to this study, includes the corporate limits of the town and select areas just outside of town for water treatment plant locations and potential future development.

Please refer to Appendix 2 and 3 for the study area map and the 20-year service area map.

Please refer to the “Andrews Existing Water System Service Area” exhibit in Appendix 4.

2.3 Economic Base

Andrews is located just south of the crossroads of SR 105 and highway 24 in Huntington County. Andrews is approximately six miles from downtown Huntington, the county seat of Huntington County. Andrews’ businesses are primarily located along SR 105 with many features that include gas station, town hall, nearby Elementary School (east side of town), Dallas Township Public Library, churches, restaurants, auction house, and many small surrounding businesses. The community has large parks located on the northeast and southeast sides of town.

2.4 Key Anchor Institutions in Andrews & Huntington County

The following key anchors were identified and considered through the planning process. Each were considered for future expansion of facilities, locations, and services based on information provided to Town or County economic development officials.

- Andrews Elementary School, located at 509 East Jefferson Street.
- Lions Club Baseball Diamonds, located on the southeast side of town
- Town Public Park, located on the northeast side of town
- Dallas Township Public Library, located at 30 East Madison Street.

2.5 Demographics

Table 2.1

Andrews & Huntington County Demographics[1]

Category & Criteria	Results Our Town / State
H.S. Diploma or More - % of adults ages 25+	87.1% / 88.8%
Bachelor's Deg. or More - % of adults ages 25+ (2019)	17.7% / 26.5%
House Value (2019)	$62,642 / $156,000
Median Household Income	$43,752 / $57,603

1. Stats Indiana (InDepth Profile: STATS Indiana)

Our demographics indicate a financially challenged community with median household income averages approximately $14,000 below that of the state-wide income average. College attainment is 30%+ lower than the state averages. Our goal for any improvement needs to be to get the maximum life out of our assets and to maximize grant opportunities when capital improvements are required.

Chapter 3 - Water Infrastructure Planning Committee (WIPC)

AME Consulting worked closely with the town administration throughout the planning process. This group is referred to as our "Water Infrastructure Planning Committee" (WIPC). The goals of this group are to be engaged in multiple meetings, attend field trips, stay informed on study progress, provide input to AME Consulting, and convey information throughout the community related to the study's progress and results.

3.1 Members of the Water Infrastructure Planning Committee

The members of the WIPC represent a group of concerned citizens, have community ties to multiple organizations, local churches, business-owners, various boards, clubs, with many social and professional connections throughout the community.

Each member of the committee understands their role to seek input throughout the community and inviting interested parties to attend a meeting or routine updates at a council meeting.

As a brief explanation to help the readers understand why other stakeholder's groups were not larger, the town provides the following reasons:

- Our community is a small community with many of our community leaders providing leadership in other sectors outside of being an elected official or town employees.
- Those on the committee represent some of the best that Andrews has to offer for leaders, communicators, and those involved throughout the community.
- The town's overall strategy is that members of the WIPC would communicate progress and accomplishments with residents and group that they are connected to, and that the town would engage other civic groups to assist with communicating opportunities for input and recommendations.
- All council meetings are advertised and open to the public, the progress and accomplishments of this study were discussed at near every meeting for many months.
- The town council president asked each town council member to reach out to their base of constituents, inform them, and seek feedback.
- The town used the town's website, www.andrewsindiana.net, as a method of distributing information to the citizens, businesses, and other civic organizations on multiple occasions.

The members of the WIPC included:

Name	Title/Organization
John Harshbarger	Town Council President
Laura Dillon	Town Council Member
Roger Newsome, Jr.	Town Council Member
Laury Powell	Clerk-Treasurer

Julie Bowers	Deputy Clerk
Colin Bullock	Utility Superintendent

In addition, the WIPC was comprised of elected officials that together with AME Consulting routinely provide comments and updates at Town Council meetings throughout the study process.

3.2 Summary of Water Infrastructure Planning Committee's Work

The Water Infrastructure Planning Committee (WIPC) provided information on concerns that they have with the current utility systems and were involved in creating goals, setting priorities, providing input, and selecting alternatives.

Multiple meetings have been held related to drinking water needs, they heard presentations from professional engineers at AME Consulting on the relevant topics of the day. This Utilities Preliminary Engineering Report incorporates previously identified issues and public concerns, evaluations, alternatives, and unanimous guidance to proceed with pursuit of funding options.

Consensus on the selected plan, priorities, and funding approach was achieved through a robust discussion with the WIPC in which needs, alternatives, costs, remaining asset life, and implementation schedule were examined. The decisions reached represent a true consensus of the stakeholders that the best approach for the town has been selected, with the best funding options, and implementation schedules.

3.3 Role of the Water Infrastructure Planning Committee

The Water Infrastructure Planning Committee (WIPC) serves as a liaison to the local community and provides guidance through the planning process. The members of the WIPC brought concerns from the community to the meetings, relayed ideas, alternatives, and participated in the selection of alternatives process. The members were informed on the operations, locations, goals, strategies, and challenges for each of the utilities. The group became well versed on operational needs, staffing needs, goals for their utilities, and ways to continue improvements throughout their community. Lastly, the group came to a consensus on the funding strategies and implementation schedules for each of their selected alternatives.

The role of the WIPC includes serving as a liaison between:

- The community, Residents, OCRA, Partners, Funders, All local organizations, and other impacted by the study

Each member of the WIPC has a continued role to seek and provide active public input regarding the needs and objectives to be sure they are met.

Key Data Indicators are an important representation of our utilities. The WIPC have been engaged in studying key data indicators related to water infrastructure as indicators of our success. The indicators are listed below:

Drinking Water:

- Water quality (VOC contamination in the source water)
- Water main breaks (Number and duration to get fixed)
- Water loss (Volume of water in gallons)
- Water pressure complaints (Number, frequency, and location)
- Water quality complaints (Number, frequency, and location)

Chapter 4 – Existing Facilities

The town of Andrews provides publicly owned utilities throughout their community. All drinking water customers are located within their corporate boundary. The town doesn't have annexation plans currently and has no plans to providing drinking water services outside of the community.

Huntington could be the only other utility within a reasonable distance to be financially advantageous and worthy of consideration for buying/selling services.

The following section lays out the planning area characteristics for the drinking water system.

4.1 Project Planning Area

This section defines the project planning area and the planning period. Background information and current characteristics of the planning area are also provided. This information is important to the engineering analyses and the decision-making processes discussed in following sections. The project planning area will be defined as the entire town of Andrews and the nearby surrounding area for the purposes of this study.

Please refer to Appendix 2 for the project planning area.

4.1.1 Location Map

Drinking Water Distribution Map

Due to the size and scale necessary to view the infrastructure elements, we have included the mapping and located it in the Appendix (Appendix 5) for the existing water distribution system mapping.

4.1.2 Environmental Resources Present

The topography of the service area declines as one proceeds toward the Wabash River. The elevation peaks at around 760 above sea level (AMSL) around W 200 N and decreases to around 695 AMSL near the Wabash River.

The general topography of the service area is illustrated on the Proposed Project Areas and Overall Study Area exhibit located in Appendix 2.

The town is primarily residential area with a limited amount of abandoned industrial building.

The land use surrounding the service area is agricultural. The Wabash River is

located north of the service area. Loon Creek combines with the Wabash River northwest of the service area. Loon Creek borders the service area to the west and proceeds through the southern portions of the Town's service area. Agricultural production around the service area primarily consists of row crop production of corn, soybeans, and wheat.

Significant impact to environmental resources is not expected with any of the alternatives considered. The service area exists outside of the floodplain. Exhibits shown in Appendix 22 shows the only portion of the service area normally impacted by the floodplain is along Loon Creek in the southern portions of the service area. Further, there are no wetlands recognized by the United States Fish and Wildlife Service in the service area where the alternatives are being considered. The wetland inventory for the service area and around it is provided in Appendix 22. Appendix 10 shows the soil types that are present within the study area.

Complete environmental exhibits are contained within the Appendix (Appendix 22).

This section will discuss the impacts on the environment caused by the construction of the potential improvements to the community and the potential mitigation measures to be utilized as a part of the project construction and post-project.

The environmental impacts can be classified as direct or indirect impacts. Direct impacts are caused by the construction, operation or maintenance involved with the proposed improvements and can include disruptions of traffic; damage to historical, cultural, archeological, and recreational areas; disturbance to wetlands or endangered species; erosion and resulting pollution to surface waters. Indirect impacts are influenced by project development and include changes in rate, density, location, or type of residential, commercial, or industrial development; changes in the use of open space or other land; increased air, water, or noise pollution; increased solids waste production; increased demand for potable water; socioeconomic pressures from expansion of existing facilities.

4.1.2.1 Direct Impacts

Historic, Architectural and Archeological Sites

There are limited historic, architectural, or archeological sites within the community. We don't anticipate any impact to those site and structures. All planned water main extensions will be located within the roadway or adjacent to the right-of-way that has been previously disturbed by construction activities, thereby having no effect on the existing historic buildings, historic properties, or their landscapes. If necessary, easements will be obtained for the construction, these easements will not be taken from historic properties.

Plants and Animals

The construction and operation of the potential infrastructure will not negatively impact state or federal-listed endangered species or their habitat. The project will be implemented to minimize impact to non-endangered species and their habitat. Any mitigation measures that are cited in comment letters from the Indiana Department of Natural Resources and the U.S. Fish and Wildlife Service will be implemented.

The project will follow the Endangered Species Act of 1973 and the Fish and Wildlife Coordination Act of 1934.

Floodplains and Wetlands

The 100-year frequency flood elevation has been estimated at approximately 700 feet, National Geodetic Vertical Datum of 1929 (NGVD). No portion of this project is planned within the flood hazard boundaries. The crossings of the drainageways are planned by trenchless construction methods to eliminate floodplain and wetlands impacts.

National Natural Landmarks

The construction and operation of the potential project will not have any impact National Natural Landmarks.

Open Space and Recreational Opportunities

The potential project's construction and operation will neither crease nor destroy open space and recreational opportunities.

The potential construction of the water main will have minimal impact on the open space or recreational activities in the planning area as much work as possible will take place in publicly owned right-of-way with the utilization of some privately owned easements or property owned by the community.

Prime Farmland, Soils, & Geology

A map of the soil types in the planning area and a description of the soil types is shown in the appendix (Appendix 10). Construction of the potential improvements will disturb soils in the short-term but will be limited to the immediate construction area. This project will keep siltation and erosion to a minimum. The project will obtain a NPDES Rule 5 permit for erosion and sediment control. The project will meet the requirements of the "Indiana Handbook for Erosion Control in Developing Areas".

The project will follow the Farmland Protection Act of 1981.

Groundwater, Drinking Water & Sole Source Aquifers

Construction of the potential project will have no detrimental impacts on groundwater or drinking water as there are no on-site waste systems, landfills or lagoons proposed as a part of this project.

In addition, the proposed project will have no impacts on a sole source aquifer. The project follows the Safe Drinking Water Act of 1974.

Surface Waters & Hydrology

The potential project will not adversely affect Exceptional Use streams, Outstanding State Resource waters and Scenic Rivers.

Coastal Zone Program

The potential activity complies with Indiana's approved coastal management program and will be conducted in a manner consistent with such program.

4.1.2.2 Indirect Impacts

Open Space, Recreational Opportunities and Land Use

The construction of the potential improvements will have little or no adverse effect on land use. The proposed project's construction and operation will neither create nor destroy open space and recreational opportunities.

Air Quality and Noise

The only impact on air quality resulting from implementing the "Selected Plan" would be short term and directly caused by construction activities (noise, dust, fumes, odors, etc.). This impact will be mitigated by a dust control program, provided by the contractor.

The long-term impacts on air quality caused by the project will be minimal. The project will comply with the Clean Air Act of 1977.

Community Impacts

There will be some short-term impacts caused by the potential project to the community as there will be traffic volume or flow patterns affected by the construction activities.

4.1.2.3 Induced Impacts

The community will endeavor to protect sensitive environmental resources. The elected officials realizes that the most important negative long-term impact of the project is uncontrolled and

unregulated growth that can threaten wetlands, prime farmland, forested areas, and historic resources.

The community, through the authority of its council, planning commission or other means, will ensure that future developments, as well as future supply, storage, distribution, or treatment works projects connecting to federally funded facilities will not adversely impact wetlands, archaeological/historical/structural resources, or other sensitive environmental resources. The community will require new development and treatment works projects to be constructed within the guidelines of the U.S. Fish and Wildlife Service, IDNR, IDEM, and other environmental review authorities.

4.1.2.4 Mitigation Measures

This section presents a list of mitigation measures that will be utilized for decreasing or avoiding impacts related to the construction of the potential improvements.

It is important to note that there is no substitute for avoiding impacts. Mitigation measures are recommended only when there are no feasible alternatives to those which may cause impacts. The following is a listing of mitigation measures:

Erosion, sediment, water quality and ecology-related Measures

Removal of existing vegetation will be kept to a minimum. Whenever feasible and, when appropriate, land grading and excavating will be kept to rights-of-way and to a minimum to reduce the possibilities of creating excessive runoff and erosion problems.

Appropriate structural (e.g., sediment basins, stacked hay bales, riprap) or agronomic (e.g., seeding, mulching, liming, fertilizing) practices to control runoff and sedimentation will be in place during and after construction.

Drainage systems will be stabilized as early as possible to avoid sedimentation problems. If required, a Rule 5 NPDES permit will be obtained for the project, and the guidelines of the Indiana Handbook for Erosion Control in Developing Areas will be met. An erosion and sedimentation control plan will be prepared with a required Rule 5 permit.

Surface and subsurface drainage patterns will be restored as early as possible. Construction entrances, roadways, and parking lots will be stabilized as soon as possible by means of stone pads or paving.

Construction activities (clearing and grading) will not be started until a firm schedule is known and can be effectively coordinated with the appropriate soil erosion control measures.

Areas of exposed soil will be periodically wetted and covered with temporary grass seed or mulch to minimize soil erosion. No chemicals will be used for dust control.

Construction roads, pipe storage areas, and spoils storage areas will be confined to the upland side of the trench area so that any erosion will be into the trench rather than being washed in drainageways.

Topsoil will be stockpiled separately for future use and top dressing for those areas to be restored.

Excess material resulting from pipe volume displacement will be saved for use on other parts of system construction or removed, as necessary.

Dewatering will not be discharged directly to surface waters without first being directed to a temporary sedimentation basin.

Erosion control nets/blankets will be used in any drainageways that are disturbed to minimize erosion.

Wetland and Floodplain-Related Measures

Wetlands and floodplains will not be negatively impacted by this project. No mitigating circumstances will be occurring.

Cultural Resources-Related Measures

Design aspects and construction methods will be examined to minimize impacts to cultural resources.

No known archaeological sites will be impacted by this project.

If unanticipated significant cultural resources are encountered during construction, construction activities will cease so that the resources may be studied, protected, or recovered.

Air Quality-Related Measures

Exposed soils and unpaved roadways will be swept and kept clean, and if required they will be periodically wetted to reduce the suspension of dust and air-borne contaminants.

The number and size of construction equipment and vehicles will be minimized to reduce odors and emissions.

Noise-Related Measures

Construction equipment and machinery will be well muffled and enclosed where possible.

Construction will be scheduled for daylight hours only, to minimize disturbance because of noise.

The number and size of equipment and vehicles will be minimized.

Facilities will be surrounded by tall buffer vegetation whenever possible to reduce noise, odor, and visual impacts.

Land Description for Proposed Improvements

This section describes the settings (current land use, vegetation, history) of undeveloped land to be used for structures or pipelines as a part of this project.

The proposed improvements are to be located within the existing right-of-way or property owned by the town. The right-of-way is comprised of roadways and linear-installed utilities with service connections, service lines and related appurtenances. The majority of the community is comprised of single-family homes on lots of approximately 0.25 acres. All utility projects within these areas should anticipate needs to maintain utility services, property owner access to homes, maintenance of traffic, and overnight safety requirements every day.

4.1.3 Growth Areas and Population Trends

4.1.3.1 Population

The population of the Town of Andrews was 1,149 persons in the year 2010; and 1,048 persons in the year 2020 based on census data. Historical population values for the Town of Andrews are presented in the table below.

Table 4.1
Andrews Population History[2]

Year	Population
1900	746
1910	957
1920	1,071

1930	883
1940	954
1950	1,083
1960	1,132
1970	1,207
1980	1,243
1990	1,118
2000	1,290
2010	1,149
2020	1,048

2. https://www.stats.indiana.edu/population/PopTotals/historic_counts_cities.asp

4.1.3.2 Anticipated Growth Areas

Over the last couple of years, meetings and conversations have occurred between town officials and potential developers. Based on the conversations with these developers; development is likely to occur along SR 105. The development that does occur is anticipated to be residential single-family homes in nature.

The town is hopeful about growth over the next 20-years. After much discussion, our design population will be 1,300 persons in the year 2042.

It should be noted that growth and development has been non-existent for some time as a result of the existing circumstances related to VOC contamination in the groundwater supply and concerns related to having a healthy water supply.

4.1.3.3 Future utility Demands and Capacity

While development is anticipated in the areas mentioned under the previous sections, it is difficult to quantify the extent of those water needs, particularly for industrial customers.

Additionally, utilizing a population equivalent of 1,300 persons, the corresponding demands will be met by the current capacity of the treatment facilities.

4.1.3.4 Conclusions and Public Engagement

Growth and development have been declining due to concerns related to a healthy water supply. The town is hopeful that after correcting their drinking water supply challenges, community growth can become a topic again.

4.1.4 Community Engagement

Public engagement has been accomplished through a series of events including public hearings, routine town council meeting updates, planning committee meetings, and conversations by our WIPC.

Appendix 17 provides details related to public meetings, public hearings, and related activities.

4.2 Existing Facilities/Conditions

4.2.1 Location Maps

Location maps have been provided in the appendix due to their size and scale required to be legible. Location maps for the drinking water facilities can be found in Appendix 5.

4.2.2 History

4.2.2.1 Drinking Water

The Andrews drinking water system is comprised of a well field containing three wells, one water treatment plant, one 200,000-gallon elevated water storage tanks, and a large drinking water distribution system (Single pressure zone). In The WTP was constructed in 1939. In 2008, the pressure filter media was replaced with new media consisting of anthracite, sand, and gravel. In 2009, a new 75 kW generator and associated automatic transfer switch were installed. The building and process equipment is still original to 1939.

Since 1994, the Town's water supply has been in a voluntary remediation process because of

groundwater contamination by volatile organic compounds (VOC) that originated from an industrial facility in Town, United Technologies. The voluntary remediation was entered into between United Technologies and Indiana Department of Environmental Management (IDEM) in September 1994 and was assigned the IDEM VRP #6930702. In 1994, a treatment facility consisting of a packed tower air stripper was also placed into operation to remove potential VOC contamination from the water before this water was treated at the Town's WTP and pumped to the Town distribution system. This air stripper has not consistently delivered drinking water to the Town below the maximum contaminant level for VOCs.

The treatment facility for the VOC removal is not operated or owned by the Town and is not a part of this Plan.

Finally, the water distribution system was constructed in the same period as the WTP. The distribution system has grown to approximately 47,000 lineal feet of pipe that varies in size from less than 2 inches up to 8 inches. Approximately 700 feet of the pipe is polyvinyl chloride (PVC) with the remainder of the system being comprised of cast iron pipe. Along with the distribution system, the Town operates a 200,000-gallon elevated water storage tank.

4.2.2.2 Existing Drinking Water Usage

The Andrews Water Department primarily serves residential customers, with some commercial and light industry primarily located in the downtown and east portions of the town.

The following is a summary of recent Month Reports of Operation (MROs). Complete copies of the MROs are provided in the Appendix (Appendix 6).

Table 4.2 Andrews Water 2020 Summary of Monthly Reports of Operation- Drinking Water			
Date	Average Daily Demand (Gallons)	Maximum Daily Demand (Gallons)	Total Produced (Gallons)
January 2020	94,900	148,300	3,704,300
February 2020	96,400	156,700	2,920,600
March 2020	93,600	197,300	3,116,400
April 2020	85,700	141,700	3,411,100
May 2020	76,800	131,000	3,408,200
June 2020	98,700	369,500	3,686,500
July 2020	87,500	141,700	3,867,400
August 2020	95,900	152,600	2,893,700
September 2020	91,600	124,200	2,498,900
October 2020	98,200	143,800	2,685,000
November 2020	118,500	245,600	2,667,800
December 2020	111,600	202,000	2,944,100
Summary / Averages	95,800	N/A	37,814,000

Based on the above table, the average daily demand of the water system is approximately 103,600-gallons, and the maximum day for the period was 369,500-gallons.

Table 4.3 Andrews Water 2021 Summary of Monthly Reports of Operation- Drinking Water			
Date	Average Daily Demand (Gallons)	Maximum Daily Demand (Gallons)	Total Produced (Gallons)
January 2021	93,300	144,700	2,893,200
February 2021	99,600	141,900	2,788,700
March 2021	108,000	147,700	3,349,100
April 2021	97,900	143,500	2,938,700
May 2021	79,800	115,700	2,473,500
June 2021	77,600	118,400	2,327,300
July 2021	78,200	119,900	2,424,900
August 2021	77,600	110,900	2,406,100
September 2021	76,100	104,700	2,283,600
October 2021	70,000	101,400	2,171,000
November 2021	71,200	139,500	2,137,300
December 2021	71,800	111,200	2,226,200

Summary / Averages	83,500	N/A	30,419,600

Based on the above tables, 2020 had the higher average daily demand at approximately 103,600-gallons, and the highest maximum day was 369,500-gallons.

4.2.3 Condition of Facilities - Drinking Water

4.2.3.1 Drinking Water Source Facilities

The existing treatment facility that is operated by the Town consists of an induced draft aerator, intermediate holding well/detention tank, high service pumps, a pressure filter, chlorination, and backup power. Before the groundwater wells supplying the existing induced draft aerator with raw water, all water is processed for VOC removal by a treatment facility operated by others that will not be addressed in this Plan. The following sections will address the conditions of each of these portions of the WTP along with the condition of the existing building.

Andrews has one well field with three wells. Well #2 and Well #3 are located near the existing water treatment plant. Well #1 is located north of the water treatment plant and is no longer in use due to the groundwater contamination concentrations within the aquifer at that location. Appendix 7 provides a list of registered significant groundwater wells nearby, including the three owned by the Town of Andrews. Details of the Andrews' wells are provided in the table below:

Table 4.4
Production Well Summary

Well	Capacity (gpm)	Depth (ft)	Diameter (Inches)
1	350	60	6
2	400	51	6
3	150	49	6

4.2.3.2 Drinking Water Treatment Plant

The treatment plant uses a conventional groundwater treatment process that includes aeration, detention, and filtration for iron removal and gas chlorine for disinfection. The process begins as raw water from the wells is fed to the induced draft aerator, the water goes to a holding / detention tank for 20+ minutes, is pumped by high service pumps through the horizontal pressure filter and into the distribution system where it fills the watermains and maintains the

water tower. High service pumps are energized based on the water levels within the water tower. Wells are energized based on water levels within the holding / detention tank. Chlorination occurs to the water as it leaves the water treatment plant, before entering the distribution system.

Induced Draft Aerator

The existing WTP has an induced draft aerator that receives raw water and aerates the water prior to discharging it into the intermediate wet well. The existing aerator is exhibiting signs of deterioration with the rust showing on the outside of it. Additionally the aerator is used to help lower the iron content of the water before discharge from the WTP. The Town has experience issues with iron concentrations in its finished water exceeding 0.3 million gallons per liter (mg/L) multiple times. This would be an indication the existing aerator or other filtration process is not operating correctly anymore. Based on the failure to adequately remove iron from the water, the aeration process is not operating in an adequate fashion.

Intermediate Holding Well / Detention Tank

The existing intermediate holding/detention tank receives water from the induced draft aerator before the high service pumps remove water to pump through the filters and out into the system. The holding/detention tank is comprised of concrete and the concrete is work, broken and chipped along the joints. It appears that the top section may have shifted over time and may not be properly seated on the wall sections. Each corner shows evidence of concrete eroding away to a large extent. The holding /detention tank is not in adequate condition and should be replaced before further deterioration occurs.

High Service Pumps

The WTP has two high service pumps that remove water from the intermediate holding/detention tank and pumps it through the pressure filter and out into the system. However, the performance of each pump is lacking. The pumps are designed to pump 400 gallons per minute (gpm), but because of their age and wear, one pump has declined to a 300-gpm output while the other operates at approximately 200 gpm. The Town has experienced a decrease in water demand over the previous 10 years because of a decline in industrial consumption. Because of this, the pumps have been able to meet demand requirements, but they do so very inefficiently. The motors are operating to pump 400 gpm, but the pumps operate at a much lower point. Because of the deterioration of the pump performance, the high service pumps show they have reached their useful age and are no longer adequately performing.

Horizontal Pressure Filter

The WTP has one pressure filter that receives water from the high service pumps and discharges water to the distribution system.

Iron cementation has been occurring in the filters because of the aging filter and ineffective Backwashing cycles. The condition of the fittings and the vessels shows excessive corrosion as well as the coatings failing by flaking off the vessel. The external problems associated with the corrosion and the internal problems highlighted by what is being removed from the filter indicates the filter has reached its useful life.

Further, the WTP was constructed in 1939 and shows no provisions for the removal of the initial pressure filter. We have concluded that this filter is the original filter from 1939, it is well beyond its useful life.

Finally, the finished water quality has suffered with both high iron concentrations and reports of taste and odor issues that are all indicative of an inadequate filtering process. Each of these factors indicates the pressure filter is no longer adequate for treating the water the Town uses.

Chlorination

The water plant uses chlorine gas for the disinfection of its water. The existing chlorine room lacks multiple safety requirements that IDEM is now requiring with chlorine gas disinfection facilities. This includes a warning light if chlorine has discharged into the room. The existing discharge for this facility is out the back of the unit at ground level. While this is acceptable in this circumstance, the lack of sufficient site security may not adequately protect the public from the discharge of chlorine gas. Based on these factors, the current facility is adequate for disinfection purposes, but site security improvements are necessary.

Back-Up Power

The existing standby generator was installed in 2009. The generator is in adequate condition at this point.

Treatment Building

The treatment building was constructed in 1939. The building lacks many requirements that are found in occupied buildings today. Existing conditions include:

- Only one ingress/egress route.
- No restrooms.

- The electrical and heating, ventilation, and air conditioning (HVAC) have been pieced together over the years. Code violations exist.
- Loose insulation.

Based on issues associated with occupying this building, it is not adequate for the purpose of having an operator on-site working daily within the building.

4.2.3.3 Drinking Water Storage Facilities

The existing water distribution system contains one elevated water storage tank. The water storage tank is a multi-leg elevated water storage tank. The tank is 200,000-gallons in volume.

The 200,000-gallon Elevated Storage Tank (Tower) was most recently repainted in 2009.

The tank should be inspected approximately every five years. Many contractors are available to perform this inspection. We recommend consideration for a long-term tank maintenance agreement for the tank be considered.

It is recommended to have approximately 24-hours of water storage available. As previously shown, the average daily water demand is approximately 104,000- gallons. Thus, the drinking water system has sufficient storage volume currently.

4.2.3.4 Drinking Water Distribution System

The existing water distribution system consists of approximately 51,000 linear feet of water mains. These water mains vary in diameter up to 8-inch. The existing watermain materials are a combination of cast iron and PVC C-900. Please refer to the water distribution system map in the Appendix for the locations. Based on the 2019 water loss audit, the town is experiencing 46% water loss.

Additional components of the existing distribution system include 415 metered connections, service lines, fire hydrants, and isolation valves. The valves have been operated regularly since their installation as a preventative measure, although several are need of service or replacement.

The following table summarizes the lengths of the existing water mains by their diameters within the distribution system.

Table 4.5 Water Distribution System – Water Main Summary		
Diameter (Inches)	**Length (ft)**	**Percentages**
<2	11,100	21.6%
4	13,900	27.0%
6	23,500	45.6%
8	3,000	5.8%

Age and pipe deterioration is a factor that should be used in prioritizing future watermain improvement projects. Some portions of the original water distribution system are over 80-years old and are still in use. Unfortunately, it's those watermain materials that are poorly suited for watermain that are also the oldest.

Typically, the design life of a watermain is anticipated to be 50-years. While watermains may be in operation beyond their design life, it should be assumed that those watermains have a reduced hydraulic capacity, are more susceptible to breaks, have leaky joints that contribute heavily to water loss within the system, may be undersized or made of obsolete pipe materials (Cast iron) for current construction standards, and should be planned for replacement in the future.

Typically, cast iron watermains over 50-years old have significant sediment deposits within them, thereby reducing the cross-section area of the pipe and resulting in reduced hydraulic capacity within the pipe.

Also, repair needs are common for watermains over 50-years in age. Typically, as the pipe material ages it deteriorates, and many watermains become brittle, as a result, additional main breaks occur easily. While the town's employees may be repairing one area with a break, another leak or break may develop just a few feet away. We've been given multiple examples of service call after service call on the same town block (Those areas are high priority for replacement).

Next, current design and construction standards require that no fire hydrants be placed on watermains that have a diameter less than 6-inches. Based on the town's current hydrant

inventory records most of the fire hydrants are currently located on watermains with a diameter less than 6-inches. Projects should be identified and scheduled to replace these undersized watermains with watermains of at least 6-inch diameter.

The existing water meters throughout the system have been systematically replaced by the town's personnel. Water metering is adequate for our community.

The water distribution system has several areas of improvement that should be considered based on having issues related to repair history, flow, pressure, and age of pipe materials, these include:

- All cast iron watermains are beyond their useful life, and should be planned for replacement
- All watermains smaller than 6-inch diameter with fire hydrants should be planned for replacement
- Watermain Replacement in areas of low flow or pressure. These areas will be confirmed with measurements in 2022.

4.2.3.5 Fire Protection

The town is currently rated as a Class 6 (On a scale of 10), by the Insurance Services Office of Indiana, in the Public Protection Classification (PPC) survey. The Water Supply portion of the evaluation scored well on the rating system developed by the Insurance Services Office. The Water Supply score may be improved with the strategic addition of additional hydrants, and revisions to the hydrant inspection program. Improvements to the firefighting elements of the distribution system may result in a lower classification and lower underwriter fire insurance rates.

As mentioned in the previous section, current design and construction standards do not allow fire hydrants to be located on watermains with a diameter less than 6-inches. The small diameter watermains have a small hydraulic capacity and are not capable of providing enough water for a hydrant to be utilized effectively in the event of a fire.

It is recommended to be able to provide at least 1,000-gpm at 20-psi residual from a fire hydrant serving residential areas with 11–30-foot building separations, and 2500-gpm at 20-psi residual from a fire hydrant serving commercial areas. The residual pressure is a concern as pollutants and contaminants can be introduced into the system at line pressures less than 20 psi. Many of the fire hydrants in the town do not meet this recommended level.

Several fire hydrant locations were identified as a priority for improvements based on undersized watermains from the town's fire hydrant inventory. The low flows and pressures at these fire hydrants indicate limited hydraulic capacity. Details of these hydrants are indicated in the table below:

Table 4.6
Low Flow and Pressure Fire Hydrants (Undersized Watermains)

Number	Location	Watermain Size (inch)	Flow Rate (gpm)	Pressure (psi)
1	Briant St. / Clifton St.	6	*	*
2	Morris Dead End	6	*	*
3	Morris St. / Clifton St.	6	*	*
4	Pearl St. / Morris St.	4	*	*
5	Clifton St. between McKeever and Monroe	6	*	*
6	McKeever St. / Pearl St.	6	*	*
7	McKeever St. / Berry St.	4	*	*
8	Berry St. / Jefferson St.	6	*	*
9	Jefferson St. / Snowden St.	8	*	*
10	Main St. / McKeever St.	4	*	*
11	Main St. / Jefferson St.	8	*	*
12	Jackson St. / McKeever St.	6	*	*
13	McKeever St. / Maple St.	4	*	*
14	McKeever St. between Harrison St and State St.	4	*	*
15	McKeever St. / Leedy Ln.	6	*	*
16	Hendricks St. / South St.	6	*	*
17	Jefferson St. / Chestnut St.	6	*	*
18	Jefferson St. / Jackson St.	8	*	*
19	Washington St. / Market St.	4	*	*
20	Washington St. / Maple St.	4	*	*
21	State St. / Star St.	6	*	*
22	Market St. / Jackson St.	4	*	*
23	Main St. / Terrel St.	4	*	*
24	Wabash St. / Cubberly St.	4	*	*
25	Terrel St. Dead End	6	*	*
26	Snowden St. half block North of Terrel St.	6	*	*
27	California St. / Market St.	6	*	*
28	Main St. / California St.	6	*	*

29	Main St. / Alabama St.	6	*	*
30	Colorado St. / California St.	6	*	*
31	California St. Dead End	6	*	*
32	Virginia St. / Market St.	4	*	*
33	Virginia St. / Jackson St.	4	*	*
34	@ WWTP	4	*	*
35	Ruby St. / Jackson St.	6	*	*
36	Ruby St. / Colorado St.	6	*	*
37	Colorado St. / Illinois St.	6	*	*
38	Illinois St. / Market St.	6	*	*

* Current flow and pressure measurements were not available at this time. These will be updated in 2022.

The above table shows many watermains with fire hydrants on watermains with a diameter smaller than 6-inches, those areas should be planned for improvements.

4.2.3.6 Drinking Water Conclusions

The water production capacities of the well field are threatened by increasing VOC contamination levels and a new water source should be sought. The water treatment plant is beyond its useful life and replacement is necessary.

The watermains are showing a high level of water loss and improvements should be planned. Watermain improvements should be considered to improve flow, pressure, fire protection, and water quality issues.

The finished water storage capacity is adequate.

The above identified needs will be explored further in the alternative's sections.

4.2.4 Financial Status of Existing Drinking Water Utility

Rate tables and related ordinances are provided in the Appendix (Appendix 21). The water rates were last adjusted in 2016.

The drinking water utility is managed in a professional manner with revenues that slightly exceed expenses. The town has no debt in the water utility.

The drinking water utility does not currently have a water tank maintenance agreement, although one may be sought at any time.

4.3 Vision of the Future State and Use of the Drinking Water Utility

4.3.1 Drinking Water

The future vision for the town's drinking water system is to have a safe, reliable, and effective treatment and distribution system. The utility will satisfy the community expectations for a reliable drinking water utility. With the implementation of the recommendations of this plan a new innovative water treatment technology will be built to replace the treatment components that are beyond their useful life and not performing as needed. In addition, proposed water main improvements will allow for improved service, flow, pressure, and water delivery in the system.

Being future focused beyond the recommended capital improvements, over the next 5-10 years, we anticipate that additional water main replacements will be necessary. The replacements will be necessary because of pipe deterioration, primarily due to age of the infrastructure. The town is in an advantageous position with the necessary skills and equipment to perform water main replacement, with the limit being their available manpower. We recommend that the town prioritizes water main replacements based on age, location, interconnectivity, size, pipe material, and repair history. Each year, the water utility should target a new water main for replacement.

The water treatment plant is overdue for improvements and is on borrowed time and filter replacement is overdue. We recommend significant treatment plant improvements to address this issue. Those improvements will result in a water plant that is ready to meet community needs beyond the life of this planning study (20-years).

Consideration may be given for a maintenance contract on the water tank. Currently, the water tanks maintenance is hired out on an as necessary basis which is fine, but it may be possible to have a more cost-effective approach with a maintenance contract.

4.4 Outline of Key Goals, Strategies and Desired Outcomes

The desired outcome of this plan is for the Town of Andrews is to have safe and efficient drinking water, wastewater, and stormwater systems. The strategy for achieving this outcome is to evaluate the current system and record its needs while also considering future needs of the system.

4.4.1 Drinking Water - Key Goals

- Develop a new water source that is free of VOC contamination concerns.
- Provide a system that can produce safe and reliable drinking water. Safe and reliable drinking water is water that can be delivered to the user and is safe for drinking, food preparation, personal hygiene and washing. Reliability always includes consistent availability. (Measurables: Eliminate water plant production reliability issues which specifically includes replacement of filters that are beyond their useful life; maintain a minimum 20 psi in the

system; maintain free chlorine over 0.5 mg/l; maintain iron in the finished water below 0.3 mg/l)

- Address water system flow and pressure issues (Reduce customer complaints and distribution system issues by 75%)
- Improve operational efficiency and reliability (Goal of reducing main repairs by 50% on an annual basis)
- Reduce Water Loss from 46% in the last audit to 25% or less.
- Apply for funding of recommended improvements in ASAP.

Chapter 5 - Need for Project

5.1 Drinking Water

The groundwater source is exposed to ever increasing levels of VOC contamination that is moving through the nearby aquifer. The contamination is the result of a chemical spill by a local industry many years ago.

The current system is near the end of its useful life, without filtration improvements in the next couple of years, we anticipated significant issues maintaining water treatment. The distribution system has localized areas of low flow, low pressure, consistent repairs, aged infrastructures, undersized mains, inadequate main looping, and fire protection needs.

5.2 Health, Sanitation, Security

To gain a better understanding of the health and safety concerns of the community, public hearings were held to allow residents to voice their issues with the current conditions of the drinking water, environmental contamination, and related concerns.

5.2.1 Health, Sanitation, Security – Drinking Water

VOC contamination is a real health and safety concern in Andrews. The VOC levels have been increasing in the town's groundwater supply and most recent tests have been right at the MCL.

The water treatment plant is beyond its useful life and filter failure is soon. If the filters fail, the plant will not be able to produce reliably and at the same quality. While not an immediate health and sanitation situation today, the consequences of filter failure do present a health and sanitation threat as water production will be impossible without improvements.

Many water mains are less than 6-inch diameter and as such do not meet NFPA recommendations for firefighting capacity, further these water mains do not meet Indiana Code for firefighting. The lack of adequate firefighting is a concern that needs addressed.

The many water main breaks experienced in the distribution system is a health and sanitation issue for those localized areas of the town where the breaks have occurred. Each time a break occurs, contamination within the water main is likely and the impacts residents as they are without water until the situation is repaired. Further, many of the water mains are made of cast iron or asbestos-cement pipe material. The asbestos-cement pipe is a health and safety issue for the individuals working on the pipe repairs. Both cast iron pipe and asbestos-cement pipe should be removed and replaced from the system because they are past their useful life, becoming more brittle with age, and present these health/safety concerns.

The water treatment plant lacks comprehensive security.

5.3 Aging Infrastructure

Failing pipe and structures can be attributed to aging infrastructure that has met its intended useful life. These facilities, like any other, need replaced once maintenance becomes too costly.

5.3.1 Aging Infrastructure – Drinking Water

Most of the water mains are comprised of cast iron pipe or asbestos-cement. These water main materials are well beyond their useful life. Both, cast-iron and asbestos-cement pipe are no longer recommended for new watermain installations. As these materials age, they become brittle and are prone to a greater frequency of breaks. All cast iron pipe and asbestos-cement pipe should be replaced within the system.

At the drinking water plant, the existing filters are well beyond their useful life and is prone to short circuiting behavior, meaning that water isn't being properly filtered that passes through that filter. The town only has the one filter. The building and detention tank are also in a very deteriorated condition and should be planned for replacement in the near future.

5.4 System Operations and Maintenance

The problems and concerns are a result of the following:

- Increasing threat from groundwater contamination (VOC's)
- Filter reliability at the drinking water treatment plant
- Undersized and aged watermains
- Lack of a routine maintenance program.
- Aged infrastructure

As a result of this study, the town has had many robust conversations related to how to address the above system operations and maintenance needs. The following plans have been developed and are being implemented:

5.4.1 System Operations and Maintenance Plan – Drinking Water

The water department has a list of water mains that are beyond their useful life. The worst will be planned for a capital improvements project in the immediate future. The remainder will be planned for replacement using town staff and equipment, with goals re-evaluated each year. If it is determined that town staff and equipment cannot accomplish all that is necessary for a given 5-year planning period, then a capital improvements project will be planned.

The water department has an acceptable maintenance plan that will be continued.

5.5 Reasonable Growth

The town is not predicted to grow significantly; over the next 40 years the population growth rate is currently projected to be 1% or less per year. However, the proposed projects are not driven by population growth; they are driven by existing unmet needs that will serve both existing residents and provide capacity to serve any growth that may occur in the community. All growth will be hindered without adequate and safe drinking water.

Chapter 6 - Evaluation of Alternatives

Multiple alternatives were considered for the drinking water utility to get away from the environmental contamination that is getting into their current source water. The existing water treatment plant has been compromised by environmental contamination that has moved near the well field and is influencing the water quality throughout the community. The following is a description of each of the drinking water treatment and/or sources alternatives.

6.1 Drinking Water Alternatives Introduction

Based on the information and discussions to this point, a range of feasible improvement projects can be identified to meet the current and future needs.

These feasible improvement projects include a new drinking water treatment plant located with supply wells in a different source-water aquifer (Away from the existing groundwater contamination), water purchased from another nearby community and piped to the town, or no action. It should be noted that a “No action” alternative is typically requested by IDEM SRF or USDA-RD as a part of their funding requirements and considerations.

6.1.1 Drinking Water Utility - No Action with Optimum Operation of Existing Facilities

The existing system is well maintained and efficiently utilized by the waterworks staff, for its age. Due to the presence and continued movement of the environmental contamination, optimum operation alone will not meet the needs of the town.

"No action" is not a feasible alternative for the Town of Andrews. The Town’s water supply faces several concerns for current and future operations. If no action is the choice of the water plant, then existing and future customers will eventually face problems related to an increasing presence of environmental contamination. The extent of the project needs, and related environmental contamination, location, constituents, and testing data are a part of the preceding chapters.

6.1.1.1 Description/Design Criteria

Alternative number one is to leave the drinking water system as is and provide no updates to the current system. This alternative has been ruled out because of the presence of groundwater pollution and the fact that the existing facility is reliant on that groundwater as its source water. The Town of Andrews has many notices to those that receive their water warning against the consumption of their water, due to the groundwater pollution that isn’t adequately removed by the existing water treatment plant.

6.1.1.2 Maps – Drinking Water Alterative 1

No maps of the no action alternative have been developed. The exhibits at the end of this report do provide location information and some watermain sizing information of the existing water distribution system.

6.1.1.3 Environmental Impacts – Drinking Water Alterative 1

There would be no changes to the current drinking water system so there would be no environmental impacts.

6.1.1.4 Land Requirements – Drinking Water Alterative 1

No new land would be disturbed because of this alterative.

6.1.1.5 Construction Considerations – Drinking Water Alterative 1

No action would be taken so there are no construction considerations.

6.1.1.6 General Cost Estimates – Drinking Water Alterative 1

There is no cost associated with this alternative.

6.1.1.7 Advantages/Disadvantages of Each Alternative – Drinking Water Alterative 1

Advantages:
There is no cost associated with this alternative, so this is the lowest cost alternative.

Disadvantages:
None of the current system issues would be addressed so the issues would remain or get worse.

6.1.1.8 Sustainability Considerations – Drinking Water Alterative 1

No sustainability considerations within the no action alternative.

6.1.2 Alternative 2 – New Water Treatment Plant, Located South of Town

6.1.2.1 Description/Design Criteria

Alternative number two involves a new water treatment plant will be located on approximately five acres of land that has been farm field for a lengthy period of time. From the new water treatment plant, a finished water/distribution main will run along existing roadways (Within the right-of-way or easement) to a connection location at the intersection of Jefferson and SR 105 in downtown Andrews. The installation of the watermain at the creek crossing will be performed utilizing a trenchless

installation method (Horizontal directional drilling) to avoid any disturbances to land within the floodway.

Scope of Work: Water Treatment Plant, Well field, Raw Water Main & Distribution Main

- 200-gpm Water Treatment Plant (WTP) based on a Tonka Dualator III packaged unit including simul-wash, high service pumps, backwash handling system with red-water holding tank.
- Red-water holding tank provided with clear-water recycle and iron-solid disposal pump system.
- Control panel with HMI touchscreen and SCADA components. Operator friendly graphics allowing for remote monitoring/control features.
- Chemical Feed Systems: Chlorine Gas, Phosphate
- The water treatment plant building will be a pre-engineered building, approximately 1,800 sq. ft. that provides for the systems described above as well as an electrical room, basic office, and an area for basic drinking water quality tests.
- A backup (Secondary) Power Feed will be provided by a standby generator and automatic switchgear.
- Sitework shall include yard piping/valves, security fence, lighting, parking, curb/sidewalk, and a stone access drive.
- Well field will include two wells, with one well located within the WTP building and the other well approximately 300-ft away within a well house (Approx. 180 sq. ft.)
- The distribution main shall be 12-inch in diameter and shall extend from the water plant location to the intersection of Jefferson and SR 105 in downtown Andrews. The main will be installed by horizontal directional drilling at the creek crossing.
- Construction administration and Construction observation services are anticipated to have a duration of no more than 18-months and could occur between Spring-2023 and Fall-2024.
- Finally, the existing water treatment plant and wells will be demolished after the new water treatment plant goes on-line.

Permits anticipated:

- IDEM Construction Permit
- IDEM Wellhead Protection
- IDEM NOI Rule 5
- INDOT Cut-Road
- IDNR Construction-in-a-Floodway
- County Highway Right-of-Way
- Local Right-of-way approval (By Town)

6.1.2.2 Maps/Exhibits –Alterative 2, New Water Treatment Plant

Please refer to the following exhibits at the end of this report for details:

- Title, "New Water Treatment Plant Option," not dated
- Title, "Water Treatment Plant Floorplan," not dated

Some additional details of the existing water system are shown on the other exhibits at the end of the report.

In this alternate, a new water treatment plant is constructed, two new wells are drilled in a new source-water aquifer, and a 12-inch diameter finished watermain is extended into town. The existing water treatment plant will be demolished when the new plant goes on-line.

6.1.2.3 Environmental Impacts – Alterative 2, New Water Treatment Plant

In this alternative, significant work is located at a new site for the water treatment plant (Approximately 5 acres) and a finished watermain is extended along existing roadways. The new water treatment plant site will be disturbed for the first time, while the route of the watermain along the existing roads has been disturbed many times. No environmental impacts are anticipated, but environmental reviews and clearances will be needed.

6.1.2.4 Land Requirements – Alterative 2, New Water Treatment Plant

The town will acquire sufficient property for a minimum of two new wells and the new water treatment plant. For planning purposes, this site size is assumed to be approximately 5 acres. New land will be disturbed because of this new water plant and well field.

6.1.2.5 Construction Considerations – Alterative 2, New Water Treatment Plant

Erosion control and dust mitigation will be required as a part of this alternative as a part of any excavation and demolition activities. A Rule 5 permit will be sought, and compliance confirmed throughout construction. The compliance with the Rule 5 permit is a demonstration of effective erosion and dust mitigation.

6.1.2.6 General Cost Estimates – Alterative 2, New Water Treatment Plant

Table 6.1
TOWN OF ANDREWS, INDIANA

Engineer's Opinion of Probable Construction Costs – January 20, 2022

Alternative 2 - New Water Treatment Plant

No	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL COST
1	Water Treatment Plant Building (36'x48') w/ 14' clear height	SQ FT	1,792	$300.00	$537,600.00
2	Building Electrical	LS	1	$35,000.00	$35,000.00
3	Building HVAC	LS	1	$20,000.00	$20,000.00
4	Backwash Holding Tank (22'x22' 10' High)	EA	1	$150,000.00	$150,000.00
5	Backwash Pit	EA	1	$5,000.00	$5,000.00
6	Backwash Piping	LF	150	$250.00	$37,500.00
7	Well House (10'x18') (New Building)	SQ FT	180	$300.00	$54,000.00
8	Well within the Water Treatment Plant	SQ FT	200	$300.00	$60,000.00
9	Well Drilling and Development	EA	2	$250,000.00	$500,000.00
10	Raw Watermains (Well to WTP)	LF	350	$100.00	$35,000.00
11	Raw Water Valving (Well to WTP)	EA	6	$5,500.00	$33,000.00
12	Equipment - Tonka Dualator (200-gpm Gravity Filters)	EA	1	$610,000.00	$610,000.00
13	High Service Pumps	EA	2	$25,000.00	$50,000.00
14	Equipment - Air Scour for Backwash Process	EA	1	$95,000.00	$95,000.00
15	Equipment - Backwash Holding Tank (Recycle)	EA	1	$60,000.00	$60,000.00
16	Equipment - Iron Solids Pump/Loading Station	EA	1	$50,000.00	$50,000.00
17	Equipment - Automatic Backwash, HMI, Actuators, Panel	LS	1	$110,000.00	$110,000.00
18	Equipment - Chlorine Gas for Disinfection	EA	1	$175,000.00	$175,000.00
19	Equipment - 60KW Generator and Switchgear	LS	1	$100,000.00	$100,000.00
20	Well Piping, within building	LF	50	$200.00	$10,000.00

21	Plant Piping, 6-inch	LF	150	$200.00	$30,000.00
22	Plant Piping, 4-inch	LF	100	$150.00	$15,000.00
23	Plant Piping, less than 4-inch	LF	100	$100.00	$10,000.00
24	Check Valves	EA	4	$2,000.00	$8,000.00
25	Gate Valves	EA	6	$2,500.00	$15,000.00
26	Flow meters	EA	4	$12,000.00	$48,000.00
27	Spill Containment Skids	EA	2	$1,200.00	$2,400.00
28	Site Work (Drainage inlets)	EA	6	$3,000.00	$18,000.00
29	Site Work (Catch Basins)	EA	4	$4,500.00	$18,000.00
30	Site Work (12-inch piping)	LF	550	$120.00	$66,000.00
31	Site Work (Outlet Structure)	LF	1	$2,500.00	$2,500.00
32	Site Work (Detention Pond)	LS	1	$15,000.00	$15,000.00
33	Site Lighting	LS	1	$4,000.00	$4,000.00
34	Site Electrical	LS	1	$8,500.00	$8,500.00
35	Fence	LF	600	$12.00	$7,200.00
36	Curb	LF	80	$65.00	$5,200.00
37	Sidewalk	SY	133	$90.00	$12,000.00
38	Asphalt Drive: Sub-Base Stone	TON	75	$70.00	$5,250.00
39	Asphalt Drive: 3.5" Base Asphalt Layer	TON	80	$100.00	$8,000.00
40	Asphalt Drive: 1.5" Surface Asphalt Layer	TON	35	$125.00	$4,375.00
41	Grinder Pump Station	EA	1	$10,000.00	$10,000.00
42	1.25" Forcemain	LF	6,000	$10.00	$60,000.00
43	Grading with Grass Seed & Mulch	LS	1	$17,500.00	$17,500.00
44	Full Depth Granular Backfill	CY	200	$60.00	$12,000.00
45	Erosion Control	LS	1	$7,500.00	$7,500.00
46	Construction Engineering / Staking	LS	1	$7,500.00	$7,500.00
47	Mobilization / Demobilization / Insurance & Bonds	LS	1	$90,000.00	$90,000.00
48	Construction Sub-Total				$3,234,025.00
49	Engineering, legal, administrative, permits, bidding, inspection, etc. (Soft Costs @ ~25%)				$811,350.00
TOTAL PROJECT COSTS					**$4,045,375**

Table 6.2

12-Inch Distribution Line Extension

No	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL COST
50	12-inch Watermain	LF	7,000	$70.00	$490,000.00
51	12-inch Watermain (HDD for Creek Crossing)	LF	500	$235.00	$117,500.00
52	Fire Hydrants Assembly w/ 6" Valve, Box, Riser, Cover	EA	19	$5,500.00	$104,500.00
53	12" Mainline Valves, Box, Riser, Cover	EA	6	$9,500.00	$57,000.00
54	Full Depth Granular Backfill	CY	500	$60.00	$30,000.00
55	Connection to Existing System	LS	1	$10,000.00	$10,000.00
56	Erosion Control	LS	1	$15,000.00	$15,000.00
57	Construction Engineering / Staking	LS	1	$10,000.00	$10,000.00
58	Mobilization / Demobilization / Insurance & Bonds	LS	1	$22,500.00	$22,500.00
	Construction Sub-Total				$856,500.00
	Engineering, legal, administrative, permits, bidding, inspection, etc. (Soft Costs @ ~25%)				$214,125.00
TOTAL PROJECT COSTS					**$1,070,625**

Notes:

- The new water treatment plant includes a restroom within the plant.
- We have assumed that the well testing results will show the need for only two wells.
- The county right-of-way is 35-ft and the INDOT right-of-way is 40-ft. Ideally, for long-term maintenance and access, we'd pursue easement for the placement of the watermains, although it could be located within the right-of-way.

Table 6.3 Summary of Implementation Costs Alt. 2 – New Water Treatment Plant		
Number	**Description**	**Cost**
1	New Water Plant, Capital Costs	$4,045,375
2	New Watermain Extension from Plant to Town, Capital Costs	$1,070,625
3	Land Acquisition – New Water Plant Site	$80,000
4	Land Acquisition, Professional Services	$50,000
5	Easement Budget	$50,000
6	Test Wells	$160,000
	TOTAL CAPITAL/IMPLEMENTATION COSTS	$5,456,000

6.1.2.7 Advantages/Disadvantages of Each Alternative – Alterative 2, New Water Treatment Plant

Advantages:

- New treatment facility
- Source water is sufficiently away from groundwater pollution source
- The selected treatment process is easy to operate and operation friendly with many built-in features including auto-backwash, opportunities to inspect each step of the process while in operations, increased sampling opportunities, improved controls, and metering
- The facility is larger and on a larger site than the existing facility, allowing for material and component storages

Disadvantages:

- Construction is anticipated to be 18-months

6.1.2.8 Sustainability Considerations – Alterative 2, New Water Treatment Plant

The new treatment facility lends itself well to the implementation of green infrastructure, return/recycle, and related sustainable objectives. The new facility will be equipped with high efficiency motors, LED lighting, a backwash water recycling system, and site improvements that include green infrastructure components. During the detailed design of this project, efforts will be made with IDEM SRF and the sustainability/green checklist to seek the most advantageous design for the Town.

6.1.3 Alternative 3 – Booster Station, Connection to Huntington for Water (Regional Supply)

In this alternative, the town will cease to produce their own water and will buy water from Huntington. The Huntington water system's nearest point of connection is several miles away and the hydraulics will require a booster station located at that connection point. The town would own and operate the booster station and accept water from Huntington at that location through a master meter. From the booster station, a 12-inch water main will need to be extended to town and to a location at the town's existing elevated water storage tank. The town will need to acquire a site for the booster station, and likely several easements to allow for the watermain construction.

Further, the following items will need to be finalized as a part of this alternative, assumptions are provided below for this feasibility study:

Table 6.4
Regionalization Factors

Number	Topic to be finalized with Huntington	Assumption for this evaluation
1	Purchase price of water	Existing rate structure + 15% for Out-of-Corporate Limits Customer
2	Responsibility for non-revenue water in Andrews (leaks, fires, flushing lines, utility bill adjustments, etc.)	100% Paid by Town of Andrews to Huntington
3	Future Costs for Water following Huntington's future water treatment capacity improvements	Cost to Town of Andrews of $50,000/year
4	Master Meter reading at Booster Station	SCADA or similar automatic reporting to Huntington. Built into Booster Station controls
5	Billing to Town from Huntington	One monthly bill from Huntington
6	Responsibility for Operations, Maintenance, and Replacement of the Booster Station	100% Town of Andrews
7	Responsibility for Operations, Maintenance, and Replacement of transmission main from Booster Station to the Town	100% Town of Andrews
8	Access/Responsibility limits at the Booster Station	100% Town of Andrews
9	Chlorine Residual in Andrews Distribution System	100% Town of Andrews. Chlorine addition planned at Booster Station

10	Chlorine residual testing in Andrews Distribution System	100% Town of Andrews
11	Operations, Maintenance, Replacement of all existing utility asset in Town	100% Town of Andrews
12	Water Rate Increases from Huntington	100% Huntington
13	Water rate increases to customers in Andrews	100% Town of Andrews
14	Huntington to have sufficient water capacity to serve the Town	100% Huntington. Understood that capacity exists now, and further capacity expansions will be provided with future water treatment improvements in Huntington. Huntington will supply Andrews ahead of committing supply to their future Industrial Park Economic Goals.
15	Timing on Huntington Future Water Treatment Plant Capacity Improvements	Unknown, Assumed completed and ready in January 2024
16	Demolition of Existing Andrews Water Treatment Plant	100% Town of Andrews
17	Distribution System Improvements in Town of Andrews	None, as a part of this alternative
18	Costs for Booster Station Site acquisition	100% Town of Andrews
19	Costs for easement professional services and acquisition	100% Town of Andrews
20	Cost for Professional Services involved with above negotiations	Each community pays for their own professionals
21	Water quality delivered to Town of Andrews Booster Station	100% Huntington

6.1.3.1 Description/Design Criteria –Alternative 3, Booster Station and Regional Supply

Alternative number three involves demolition to the existing water treatment plant in Andrews and reliance of water provided by the City of Huntington to a Town owned and operated Boosters Station near SR 9.

The 600 sq. ft. booster station will be provided with three high service pumps, a chlorine room, mechanical room, electrical/control room, and a small office. Additionally, the booster station will have a small work bench, phosphate feed equipment and spill containment, gas chlorine feed equipment, small external on-site storage tank for finished water, and master metering system. We anticipate the building to be a split-face block construction with a clear height of 10-ft for equipment OM&R.

Further, inside the booster station it will contain all necessary piping, valves, equipment rails, chemical injection, testing equipment, pressure gauges and meters. A bathroom will not be located within the building, but a small sink will be located at the work bench for water sampling purposes. All necessary electrical, mechanical and chlorine equipment elements will be provided within their respective rooms.

The exterior of the booster station building will be provided with an asphalt driveway, limited parking, dusk-to-dawn lights, parking/site light, a 10'x14' storage shed, fence, security gate, security system, site drainage infrastructure, curb, short sidewalk, grass and lastly a generator with auto-transfer switch in the event of a power interruption.

Permits anticipated:

- IDEM Construction Permit
- IDEM NOI Rule 5
- INDOT Cut-Road
- Approvals from Huntington for connections
- Approvals from Huntington for billing, consumption fees, and related OM&R.
- County Highway Right-of-Way
- Local Right-of-way approval (By Town)

6.1.3.2 Maps/Exhibits –Alternative 3, Booster Station and Regional Supply

Please refer to the following exhibits provided at the end of this study for additional location information and development details:

- Titled, "Regional Option from City of Huntington," dated 1/27/2022
- Titled, "Regional Option (Huntington Connection)," dated 1/27/2022
- Titled, "Regional Option (Town Connection)," dated 1/27/2022
- Titled, "Booster Station Floorplan," dated 1/27/2022

6.1.3.3 Environmental Impacts – Alternative 3, Booster Station and Regional Supply

There will need to be full environmental review and consideration for the selected booster station site and watermain alignment. It is anticipated that all issues can be resolved with mitigation and without that review completed yet, we have assumed no significant issues.

6.1.3.4 Land Requirements – Alternative 3, Booster Station and Regional Supply

The booster station site should be a minimum of 1 acre, with a preference for 2 acres. The watermain alignment has not had final design completed yet. We anticipate a need for 35

easements for the watermain alignment, but that should be revisited during the detailed design of the watermain.

6.1.3.5 Construction Considerations – Alternative 3, Booster Station and Regional Supply

Typical construction considerations associated with building construction and watermain excavation. Erosion control and dust mitigation will be required as a part of this alternative. A Rule 5 Soil and Erosion Control permit will be necessary.

6.1.3.6 General Cost Estimates –Alternative 3, Booster Station and Regional Supply

The following provides the capital cost and implementation costs only. Other related costs are evaluated further in the following sections. For a complete evaluation, all costs must be realized.

Table 6.5
TOWN OF ANDREWS, INDIANA

Engineer's Opinion of Probable Construction Costs - January 28, 2022

Regionalization with Huntington providing water (Infrastructure Extension Costs Only)

No	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL COST
1	Water Booster Station Building (30'x20') w/ 10' clear height	SQ FT	600	$300.00	$180,000.00
2	Controls/Communications Upgrades to the Tower	LS	1	$20,000.00	$20,000.00
3	Control Valve	EA	1	$20,000.00	$20,000.00
4	Building Electrical	LS	1	$30,000.00	$30,000.00
5	Building HVAC	LS	1	$20,000.00	$20,000.00
6	Storage Tank at Booster Pump Station	EA	1	$125,000.00	$125,000.00
7	H. S. Pumps (350-gpm), combined pumping up to 1,000-gpm	EA	3	$35,000.00	$105,000.00
8	Chlorine Gas - Disinfection Booster Equipment	LS	1	$180,000.00	$180,000.00
9	Equipment - 25KW Generator and Switchgear	LS	1	$75,000.00	$75,000.00

10	Booster Station Internal Piping (6-inch & 8-inch)	LF	100	$200.00	$20,000.00
11	Check Valves	EA	3	$2,500.00	$7,500.00
12	Gate Valves	EA	6	$3,000.00	$18,000.00
13	Flow meters (At Pump)	EA	3	$12,000.00	$36,000.00
14	Flow Meter - Main	EA	1	$24,000.00	$24,000.00
15	Spill Containment Skids	EA	1	$2,500.00	$2,500.00
16	Site Work (Drainage inlets)	EA	4	$4,000.00	$16,000.00
17	Site Work (Catch Basins)	EA	1	$6,000.00	$6,000.00
18	Site Work (12-inch piping)	LF	180	$150.00	$27,000.00
19	Site Work (Outlet Structure)	LF	1	$2,500.00	$2,500.00
20	Site Work (Detention Pond)	LS	1	$15,000.00	$15,000.00
21	Site Lighting	LS	1	$4,000.00	$4,000.00
22	Site Electrical	LS	1	$8,500.00	$8,500.00
23	Fence	LF	200	$12.00	$2,400.00
24	Security Gate	EA	1	$5,000.00	$5,000.00
25	Security Monitoring System	LS	1	$8,000.00	$8,000.00
26	Curb	LF	40	$65.00	$2,600.00
27	Sidewalk	SY	67	$90.00	$6,000.00
28	Sewer Connection (Small Grinder Station and forcemain)	LS	1	$20,000.00	$20,000.00
29	10'x14' Storage Shed for site/yard equipment and tools	LS	1	$10,000.00	$10,000.00
30	Site/yard maintenance equipment and tools	LS	1	$10,000.00	$10,000.00
31	Asphalt Drive/Parking: Sub-Base Stone	TON	20	$75.00	$1,500.00
32	Asphalt Drive/Parking: 3.5" Base Asphalt Layer	TON	25	$150.00	$3,750.00
33	Asphalt Drive/Parking: 1.5" Surface Asphalt Layer	TON	10	$200.00	$2,000.00
34	Grading with Grass Seed & Mulch @ Booster Station	LS	1	$5,000.00	$5,000.00
35	12-inch watermain	LF	17,500	$70.00	$1,225,000.00
36	Fire Hydrants Assembly w/ 6" Isolation Valve (600-ft interval)	EA	29	$5,500.00	$159,500.00
37	12" Mainline Valves, Box, Riser, Cover	EA	18	$9,500.00	$171,000.00

38	Full Depth Granular Backfill (Entire Route)	TON	4,875	$40.00	$195,000.00
39	Asphalt Repairs to Roads: Sub-Base Stone	TON	200	$75.00	$15,000.00
40	Asphalt Repairs to Roads: 3.5" Base Asphalt Layer	TON	250	$100.00	$25,000.00
41	Asphalt Repairs to Roads: 1.5" Surface Asphalt Layer	TON	100	$120.00	$12,000.00
42	Connection to Existing System	LS	2	$7,000.00	$14,000.00
43	Erosion Control	LS	1	$50,000.00	$50,000.00
44	Demolition of Existing Wells & WTP	LS	1	$50,000.00	$50,000.00
45	Construction Engineering / Staking	LS	1	$30,000.00	$30,000.00
46	Mobilization / Demobilization / Insurance & Bonds	LS	1	$200,000.00	$200,000.00
47	Construction Sub-Total				$3,164,750.00
48	Engineering, legal, administrative, permits, bidding, inspection, etc. (Soft Costs @ ~30%)				$949,425.00
49	Land Purchase - Booster Station Site	Acre	1	$100,000.00	$125,000.00
50	Permanent Easements for pipeline	EA	35	$5,000.00	$175,000.00
51	Professional Services for Land Acquisition	LS	1	$80,000.00	$80,000.00
TOTAL PROJECT COSTS					**$4,494,175**

6.1.3.7 Advantages/Disadvantages of Each Alternative – Alternative 3, Booster Station and Regional Supply

Advantages:

- No longer doing any treatment
- Source water is sufficiently away from groundwater pollution source

Disadvantages:

- Costs for water are very much controlled by the City of Huntington
- The City of Huntington controls water quality
- Criticality of water supply is highest level of exposure. Should there be a failure at the booster station or break within the several mile long transmission main the entire town will be without water.
- Booster station is located far from town

- Significant land acquisition efforts required that may delay construction

6.1.3.8 Sustainability Considerations – Alternative 3, Booster Station and Regional Supply

Green infrastructure elements will again be considered in the final detailed design and implementation of these improvements. We anticipate that sustainability goals can be achieved with high efficiency motors, LED lighting, and perhaps some green infrastructure elements in the drainage design.

Chapter 7 - Selection of Alternative

7.1 Introduction

A cost-effective analysis was prepared for each of the feasible alternatives listed in the previous section (Alternatives 2 & 3). The cost-effective analysis takes into consideration that initial capital (project) costs, annual operation, maintenance and replacement cost, and salvage values. All the estimated costs were brought back into today's costs for comparison purposes. A current Federal discount interest rate of 1.2% was utilized for the cost-effective analysis. A 20-year planning period is used for the cost-effective-analysis.

The estimated construction costs are based on manufacturer's quotations, estimating manuals, recent bid construction prices and estimating experience and have been slightly inflated, as the construction bids would not be received until sometime next year (Assumed January 2023 for all alternatives). The estimated salvage values are arrived at based on their future worth at the end of the 20-year planning period.

7.2 Present Worth Cost Analysis

7.2.1 Drinking Water Treatment Alterative 2 – New Water Treatment Plant

Item	Item Detail	Factor	Cost
A	Estimate of Probable Construction Cost	1	$4,250,525.00
B	Project Related/Non-Construction Costs	1	$1,205,475.00
C	Total Initial Estimated Capital Cost	A+B	$5,456,000.00
D	Estimated Annual O, M&R	1	-$5,000
E	Salvage Value	1	$50,000
F	Present Worth of Annual O, M & R	17.17*D	-$85,850
G	Present Worth Salvage Value	0.74*E	$37,000
H	Total Present Worth	C+F-G	$5,333,150

OM&R is anticipated to decrease slightly over current operations with the backwash recycling and sustainability improvements. Salvage value is expected to be low, although the building and more permanent infrastructure elements will remain useful after 20-years (Those items will not be salvaged).

7.2.2 Drinking Water Treatment – Alternative 3, Booster Station and Regional Supply

Item	Item Detail	Factor	Cost
A	Estimate of Probable Construction Cost	1	$3,164,750.00
B	Project Related/Non-Construction Costs	1	$1,329,425.00
C	Total Initial Estimated Capital Cost	A+B	$4,494,175.00
D	Estimated Annual O, M&R	1	$130,000
E	Salvage Value	1	$50,000
F	Present Worth of Annual O, M & R	17.17*D	$2,232,100.00
G	Present Worth Salvage Value	0.74*E	$37,000
H	Total Present Worth	C+F-G	$6,689,275.00

Estimated Annual OM&R is broken down as follows:

Estimated Operations, Maintenance, and Replacement (OM&R) Costs for Alternate 3 Present Worth Evaluation		
Number	**Description**	**OM&R Impact**
1	Purchase Price of Water (Per year) (Includes estimate for 43% non-revenue water)	+$100,000.00
2	Future Costs for Water following Huntington's future water treatment capacity improvements	+$50,000.00
3	Operations of Booster Station, compared to Andrews operating their own WTP (Power will be similar, reduction in chemicals, labor equivalent)	-$25,000.00
4	OM&R related to transmission main (Criticality) (Annual leakage testing)	+$5,000.00
	TOTALS	$130,000

Salvage value is expected to be low, although the building and more permanent infrastructure elements will remain useful after 20-years (Those items will not be salvaged). For our evaluation, it will be the same from Alternate 2 as salvage has no significant difference between the two alternatives being compared.

7.2.3 Present Worth Cost Analysis Comparison

Item	Item Detail	Alternative 2, New Water Treatment Plant	Alternative 3, Booster Station and Regional Supply
A	Estimate of Probable Construction Cost	$4,250,525.00	$3,164,750.00
B	Project Related/Non-Construction Costs	$1,205,475.00	$1,329,425.00
C	Total Initial Estimated Capital Cost	$5,456,000.00	$4,494,175.00
D	Estimated Annual O, M&R	-$5,000	$130,000
E	Salvage Value	$50,000	$50,000
F	Present Worth of Annual O, M & R	-$85,850	$2,232,100.00
G	Present Worth Salvage Value	$37,000	$37,000
H	Total Present Worth	$5,333,150	$6,689,275.00

The present work cost evaluation indicates that Alternative 2, New Water Treatment Plant is the more affordable long-term solution by $1,356,125.00

7.3 Matrix Rating System

To assist in alternative comparison, we have developed an evaluation matrix in this section that can be utilized to compare many of the non-monetary factors in a decision. The factors include the following:

“Desired Value Weight” = level of significance, importance, and value to the Town of Andrews

“Assigned Rating” = Score based on how well the alternative meets the state goal (zero = not at all)

“Weighted Score” = the product of the “Desired Value Weight” x “Assigned Rating”

The goals have been developed based on conservations and topics important to the Town of Andrews that should be considered as a part of the final alternative selection process.

Drinking Water Plan Goals	Required / Desired	Desired Goal Weighting	Alternative #1 No Action		Alternative 2, New Water Treatment Plant		Alternative 3, Booster Station and Regional Supply	
		Desired Value Weight (1-3)	Assigned Rating (0-3)	Weighted Score	Assigned Rating (0-3)	Weighted Score	Assigned Rating (0-3)	Weighted Score
Provide a System that can produce safe water	Required			Fail		Pass		Pass
Provide a system that will no longer be impacted by the groundwater pollution	Required			Fail		Pass		Pass
Provide a solution that can be implemented within 2-years	Required			Pass		Pass		Pass
Minimize Costs to Low-Income Residents in Andrews	Desired	2	N/A	N/A	2	4	1	2
Control water quality, operations, and Future Rate Adjustments	Desired	3	N/A	N/A	3	9	1	3
Minimize New Land Requirements	Desired	1	N/A	N/A	2	2	1	1
Speed of Construction and Delivery	Desired	3	N/A	N/A	2	6	1	3
Redundancy and risk of town being without water	Desired	3	N/A	N/A	2	6	1	3
Total Weighted Score			No-Go		27		12	

Based on the matrix evaluation of non-monetary factors in this section the "Alternative 2 – New Water Treatment Plant" scored the most favorably with a score of 27, while the "alternative 3 – Booster Station and Regional Supply" scored 12 points.

Based on non-monetary factors the ideal selection is "Alternative 2 – New Water Treatment Plant".

7.4 Other Non-Monetary Factors

Other factors, beyond financial concerns should be considered when determining which alternative is the most desirable for the community. Factors to consider include:

- Public disturbance and duration during the life of the alternate
- Resulting aesthetics post-project and years later.
- Integration with existing infrastructure elements (I.e., sidewalks, curbs, roads, etc.)
- The ability of the system to adapt to future needs, or unforeseen events beyond the timeline of this study.
- Reliability and expandability of the alternative
- Community feedback and expectations
- Feasibility of implementation

The following matrix has evaluated each of those factors for consideration and comparison.

Number	Description	Alternative 2, New Water Treatment Plant	Alternative 3, Booster Station and Regional Supply
1	Public Disturbance	Similar to another Alt	Similar to another Alt
2	Aesthetics	Similar to another Alt	Similar to another Alt
3	Integration	Similar to another Alt	Similar to another Alt
4	Adapt to Future Needs	Planned for in design	Planned for in design
5	Expandability	Planned for in design	Planned for in design
6	Community Feedback	Preferred	Undesirable
7	Implementation Schedule	Fastest	Slowest

Chapter 8 - Recommended Alternatives

The following section lays out the selected alternative for the Town of Andrews. Based on monetary factors, and those non-monetary factors evaluated in the previous chapters, the selected plan is a new water treatment plant (Alternative 2).

8.1 Project Design - Drinking Water Recommended Alternative

The recommended drinking water alternative is for a new water treatment plant (Alternate 2 throughout the evaluation in the previous chapters).

Scope of Work: Water Treatment Plant, Well field, Raw Water Main & Distribution Main

- 200-gpm Water Treatment Plant (WTP) based on a Tonka Dualator III packaged unit including simul-wash, high service pumps, backwash handling system with red-water holding tank.
- Red-water holding tank provided with clear-water recycle and iron-solid disposal pump system.
- Control panel with HMI touchscreen and SCADA components. Operator friendly graphics allowing for remote monitoring/control features.
- Chemical Feed Systems: Chlorine Gas, Phosphate
- The water treatment plant building will be a pre-engineered building, approximately 1,800 sq. ft. that provides for the systems described above as well as an electrical room, basic office, and an area for basic drinking water quality tests.
- A backup (Secondary) Power Feed will be provided by a standby generator and automatic switchgear.
- Sitework shall include yard piping/valves, security fence, lighting, parking, curb/sidewalk, and a stone access drive.
- Well field will include two wells, with one well located within the WTP building and the other well approximately 300-ft away within a well house (Approx. 180 sq. ft.)
- The distribution main shall be 12-inch in diameter and shall extend from the water plant location to the intersection of Jefferson and SR 105 in downtown Andrews. The main will be installed by horizontal directional drilling at the creek crossing.
- Construction administration and Construction observation services are anticipated to have a duration of no more than 18-months and could occur between Spring-2023 and Fall-2024.
- Finally, the existing water treatment plant and wells will be demolished after the new water treatment plant goes on-line.

8.2 Total Project Cost Estimate

Summary of Implementation Costs Alt. 2 – New Water Treatment Plant		
Number	**Description**	**Cost**
1	New Water Plant, Capital Costs	$4,045,375
2	New Watermain Extension from Plant to Town, Capital Costs	$1,070,625
3	Land Acquisition – New Water Plant Site	$80,000
4	Land Acquisition, Professional Services	$50,000
5	Easement Budget	$50,000
6	Test Wells	$160,000
	TOTAL CAPITAL/IMPLEMENTATION COSTS	$5,456,000

The drinking water improvement is planned to be funded by a combination of a Bond Anticipation Note (BAN), a Community Development Block Grant from the Office of Community and Rural Affairs, potential grants from IDEM SRF or USDA-RD. Any loans or debt will need to be supported by user rate increases.

8.3 Detailed Timetable for Implementation of Improvements

Detailed Timetable for Drinking Water Improvements Implementation			
Milestone	Action Need	Tentative Schedule	Comment
Completion of Full PER to meet SRF Requirements	Notice to Proceed from Town by 2/15/22	Ready by April 1st	Best rate and grant opportunity is available if done by 4/1/22
Determination if we will pursue funds from USDA-RD	Notice to Proceed from Town by 2/15/22	Ready by April 1st	Best rate and grant opportunity is available if done by 4/1/22

PER Approval	Submit by 4/1/22	Approval by 7/1/22	
OCRA Application	Round 1 Application TBD by 2/15/22	Funds Awarded in Q3 2022	
Design of Improvements	Notice to Proceed from Town by 4/15/22	Completion in early Q4 2022; ready to bid in Q4 2022	NTP earlier and the design will be completed earlier
Permit Applications	Begin with 90% Design Plans in Hand	Q3 2022	
Advertise for Public Bids	Q4 2022	30-day bid period	
Loan Closing	With Bids in Hand	30-60 days depending on Funding agency selected	
Contract Award	Q1 2023		
Pre-Construction Conference	Q1 2023		
Initiation of Construction	Order long lead items in Q1 2023	Begin activities in Q2 2023	
Substantial Completion	Q2 2024		
Final Completion	Q3 2024		
Start-up and Initiation of Operation	Q3 2024		

We understand that other factors may be considered for the funding of these improvements, based on negotiations with the responsible party for the groundwater contamination. Those negotiations and agreements are unknown to the engineer at the time of this study and the recommendations above follow an achievable approach for a municipality that is set to implement this project on their own.

8.4 Workforce

No groups or organizations outside the town will be responsible for the implementation of the selected alternative, unless negotiations are made for a different arrangement.

8.5 Permit Requirements

Number	Permit	Submittal Date	Approval Date	Comments
1	IDEM Construction Permit (WTP and separate NOI for watermain)	90% Design	30-60 days later	Design needs to be 90%+ completed
2	IDEM Wellhead Protection	Upon completion of new Wellhead Protection Plan	Approval 60-90 days later	Wellhead Protection Plan can be developed immediately following the test wells completion
3	IDEM NOI Rule 5	90% Design	Total process is 30-days to approval	Design needs to be 90%+ completed
4	INDOT Cut-Road	90% Design	Total process is 30-days to approval	Design needs to be 90%+ completed
5	IDNR Construction-in-a-Floodway	90% Design of watermain improvements	Total process is 60-90 days to approval	The watermain improvements design can be completed months before the water treatment plant is complete.
6	County Highway Right-of-Way	90% Design of watermain improvements	Total process is 60-90 days to approval	The watermain improvements design can be completed months before the water treatment plant is complete.
7	Local Right-of-way approval (By Town)	90% Design of watermain improvements	Total process is 30-days to approval	The watermain improvements design can be completed months before the water treatment plant is complete.

Chapter 9 – Action Items

9.1 Implementation of the Recommended Alternative

The following steps should be taken to implement this plan:

1. Seek project funding from private sources, municipal funding agencies (OCRA, SRF, USDA-RD), or traditional Bonds or Bond-Anticipation-Notes.
2. Coordinate with the town's rate consultant for financial recommendations. These may include bonds, refinancing debt, utilizing the SRF or USDA-RD program, or other options.
3. Adopt most feasible funding alternative based on social, political, and economic circumstances.
4. Prepare plans and specifications.
5. Comply with all local, state, and federal rules and regulations. Apply for all necessary permits.
6. Complete Construction