Jennings County, Indiana
Sanitary Master Plan
Preliminary Engineering Report

March 30, 2025

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Executive Summary

Introduction

Jennings Northwest Regional Utilities (JNRU) , by and through its Board, and in cooperation with the Jennings County Commissioners and the City of North Vernon, authorized HWC Engineering to prepare a Preliminary Engineering Report (PER) of a significant portion of the county's wastewater systems to develop and evaluate alternatives to address current needs and non-compliance, provide recommendations, and consider funding options for proposed wastewater improvements within the County.

Need for Project

Jennings County received an Inspection Summary/Enforcement Referral letter from the Indiana Department of Environmental Management (IDEM) dated November 10, 2022. The letter indicated that an inspection was conducted and noted numerous failing septic systems in three specific subdivisions in Jennings County; Delmar Subdivision, Lawrence Subdivision, and Greenacres Subdivision. On June 1, 2023 the Jennings County Commissioners received a Notice of Violation and Request for Settlement Conference from IDEM. The letter requests that the county enter into an Agreed Order and provide corrective actions in accordance with a required compliance plan to address the violations. On September 28, 2023 IDEM issued an Agreed Order which was signed and accepted by the Jennings County Commissioners.

In accordance with the violations discussed above, this PER has been prepared to document the need for improvements to achieve compliance with applicable codes and address the issues associated with discharge of improperly treated wastewater and other needs in the study area. The PER develops alternatives for each area of need and then provides justification for the selected plan by evaluating the feasible alternatives based on cost, technical compliance, reliability, implementation, and environmental impact.

Additionally, JNRU has had multiple noncompliance and violation letters stemming back to an Agreed Order issued in 2005 from IDEM regarding their Wastewater Treatment Plant (WWTP). The Agreed Order identified issues related to bypass operations during wet weather,

numerous effluent limitation violations, and the inability to remove sludge. In order to address these issues, many structures and processes need to be addressed include the biological treatment system which consists of a unique multi-stage activated biological process that doesn't allow for maintenance of the media; the Headworks Building and screening equipment that has deteriorated due to hydrogen sulfide exposure; and the need for a sludge clarifier and dewatering system.

Scope of Work

Based on the needs previously described, alternatives were developed and evaluated for improvements to various unsewered areas in Jennings County, improvements to the JNRU Collection and Conveyance System, and improvements to the JNRU Wastewater Treatment System. Based on an analysis of monetary, technical, reliability, implementation, and environmental impact, the following project elements are recommended for implementation:

Jennings County Unsewered Areas

- Construct a new gravity sewer system, lift station(s), and force main for Greenacres Subdivision. Force Main to discharge into proposed Crystal Glades gravity sewer system.
- Construct a new gravity sewer system for downtown Scipio to connect to Greenacres lift station and force main system.
- Construct a new gravity sewer system, lift station, and force main for Crystal Glades Subdivision. Force Main to discharge into existing JNRU gravity sewer system.
- Construct a new gravity sewer system, lift station, and force main for Lawrence Subdivision. Force main to discharge into existing JNRU gravity sewer system.

JNRU Conveyance System Improvements

- Make improvements to lift station #7 that will receive additional flow from unsewered areas. This lift station receives significant wet weather induced inflow and infiltration (I&I) from its service area as well as directly into the wet well.

JNRU Wastewater Treatment System Improvements

- Replace multi-stage activated biological process (MSABP) to an Aero-Mod biological treatment system.
- Construction a new Aero-Mod process including the aeration and clarification components.
- Convert the old MSABP tankage to aerobic digesters with needed pumping.
- Construct a new sludge dewatering system.
- Remove sludge from the bottom of the lagoons.

Environmental Benefits

Constructing a new sanitary sewer collection system to serve the aforementioned areas of Jennings County would directly address the untreated sewage discharge issues and provide considerable environmental benefit. In addition, the improvements to the JNRU Wastewater Treatment System would allow for better operations and maintenance, proper handling of solids, improvement in consistent effluent limits, and ultimately allow the system to serve JNRU into the future and allow for future connection of unsewered areas as funding allows.

Plan Implementation

The recommended Collection and Conveyance System projects are shown in **Figures 6.1** thru **6.4**. The estimated total construction cost, including contingency, is $14,850,000 as shown in **Table 6.2**. The recommended Wastewater Treatment project is shown in **Figure 6.5**. The estimated total construction cost, including contingency, is $10,603,000 as shown in **Table 6.3**. The total combined project costs including construction, construction contingency, non-construction services and fees is estimated to be $30,200,000 as shown in **Table 6.4**. An anticipated project implementation schedule is shown in **Table 6.5**.

Due to the requirements and overall cost of the proposed project, the Jennings County Board of Directors will be seeking funding from a variety of sources, including, but not limited to, the

Indiana Finance Authority's State Revolving Fund (SRF) Program. Contingent on acceptance of this PER by the owner and identification of a funding plan, design could start in early 2026. Assuming design starts in early 2026, construction could start in early 2027 and be completed in the spring of 2028. The schedule will be very dependent upon the timing and availability of adequate funding.

Section One – Project Location

1.1 Project Location

Jennings County is located in the southeast portion of Indiana, surrounded by Bartholomew, Ripley, and Jefferson Counties. The city of North Vernon is the largest city in the county, and is nearly central to the county. The city is encircled by US Highway 50 on the north end of the city and Old US 50 on the south end. JNRU is located approximately 5 miles northwest of North Vernon along State Road 7.

1.2 Study Areas

The study area includes the unsewered subdivisions of Greenacres, Lawrence, Delmar, Crystal Glades, residents along North County Road 500 West, and the undeveloped US 50 Bypass Service Area north of the City of North Vernon. Also in the study area is a portion of the JNRU collection system that would be affected by the new collection systems and the JNRU Wastewater Treatment Plant. These areas are shown in **Figure 1.2**. The study area is comprised of both urban and rural residential areas.

1.3 20-year Service Area

The anticipated 20-year service area related to the proposed improvements as shown in **Figure 1.2** is unknown, however, it is likely that all portions of the study area that are currently developed could require service in the next 20 years. Most residents are on septic systems with significant distance between homes. Future developments interested in discharging to either the JNRU or North Vernon sewer systems will require additional lift stations discharging to an adequately sized collection system connection point.

1.4 Project Areas

The project areas include the subdivisions of interest as well as a potential pipeline corridor along State Road 7; the JNRU collection system that most of the subdivisions could discharge into; the City of North Vernon's collection system (primarily related to the Delmar Subdivision) and the JNRU wastewater treatment plant. These project areas are shown in **Figure 1.2**. The

project areas will be contained within the existing rights-of-way, existing easements, and/or proposed private easements.

Figure 1.1

Jennings County Sanitary Master Plan

Project Location Map

Jennings County, Indiana

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Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU - WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

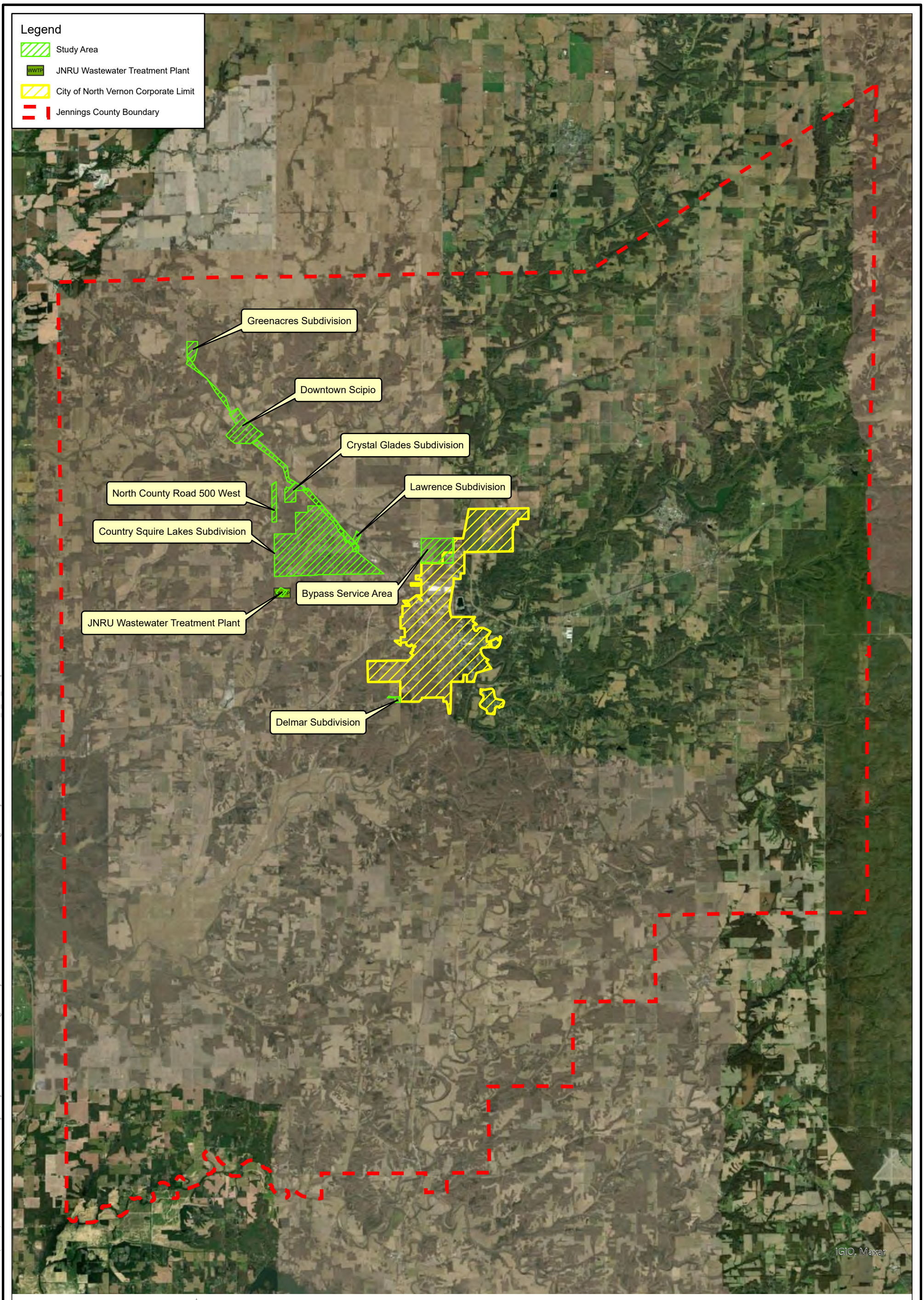

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Figure 1.2

Jennings County Sanitary Master Plan
Study Area Map
Jennings County, Indiana

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Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

Section Two – Current Situation

2.1 Introduction

This section provides a description of Jennings Northwest Regional Utilities' (JNRU) existing wastewater infrastructure and documents the current needs of the utility as well as other documented areas of the County experiencing wastewater service needs. Monthly wastewater reporting data is also evaluated to establish average and peak demands. Finally, current population trends and significant users are identified.

2.2 Current Population & Future Projections

According to the 2020 Census, the population of Jennings County is 27,613 and the City of North Vernon has a population of 6,608 people.

Table 2.1 shows the population of Jennings County over the past 60 years. Within the last 20 years the population has stayed marginally the same. While these areas may be assumed to remain constant, there are significant unsewered areas that could be incorporated into the JNRU or City of North Vernon systems.

Table 2.1

Population Trends[1]

Geographic Area	1960	1970	1980	1990	2000	2010	2020	2030[2]
Jennings County	17,267	19,454	22,854	23,661	27,554	28,525	27,613	27,227
North Vernon	4,307	4,582	5,768	5,311	6,515	6,728	6,608	6,516
Town of Scipio	430	409	396	414	414	414	412	406
Spencer Township	1,421	1,570	2,093	1,980	2,073	2,326	2,416	2,382
Geneva Township	1,731	2,640	3,849	5,040	7,469	7,584	7,495	7,390
Center Township	5,864	6,844	7,806	7,800	8,593	8,894	8,171	8,057

[1]Population history and projections for Jennings County was taken from www.stats.indiana.edu/topic/projections.asp

[2]Future populations for cities and townships were calculated using the same population percent change as Jennings County relative to 2020.

2.3 Description of Existing Collection System

2.3.1 JNRU Collection System

The JNRU Collection System currently consists exclusively of the Country Squire Lakes (CSL) subdivision. CSL currently has approximately 1,200 residents with space for an additional 200 lots. The CSL subdivision collection system consists of vacuum sewer systems with seven vacuum stations and gravity sewer systems with four lift stations which can be seen in **Figure 2.2**. These systems work together to ultimately convey sewage through combined force mains to the JNRU Treatment plant. The vacuum system consists of 6" vacuum sewers, the gravity system consists of 8" gravity sewers, and the force mains in the system consist of 3", 6" and 8" force mains. The force mains convey the sewage from North to South and ultimately combine the two 8" force mains into a single 12" force main that delivers the flow to the JNRU WWTP as shown in **Figure 2.1**.

The vacuum sewer system was originally installed in the 1970's with the most recent improvements in 2010. Some manholes in the gravity collection system were relined in the 2010 project, but the lining was done incorrectly and is already failing. There is significant Inflow and Infiltration (I&I) during rain events that increases the flow to the WWTP from an average 130,000 gpd to over 700,000 gpd depending upon precipitation levels.

2.3.2 North Vernon Collection System

The City of North Vernon has the most extensive sanitary collection system in the county. The City's wastewater utility consists of gravity sewers ranging from 8" to 36" diameter, twenty-four lift stations, and force mains ranging from 2" to 12" diameter.

The City's wastewater utility has received a Noncompliance Letter on March 13, 2023 and on June 4, 2024 related to overflows in the collection system and bypass operations at the WWTP. The City is working internally to address these issues and evaluation of potential improvements will not be included in this study.

2.3.3 Hayden

Hayden's WWTP consists of a drip irrigation system and there is no reason to believe that it is malfunctioning based on a review of IDEM records. The distance between Hayden and the JNRU WWTP is approximately 6 miles making it uneconomical to be evaluated as an additional service area for this study.

2.3.4 Butlerville

Butlerville currently pumps to the North Vernon collection system through a 10" force main. While there are some I&I issues, there isn't a feasible alternative to redirect this flow to JNRU which is over 12 miles away. Due to these factors this will not be evaluated as an additional service area for this study.

2.3.5 Currently Unserved Areas

The subdivisions, or areas of concern based on IDEM Notices of Violations (NOV's) or input from the County Health Department include Greenacres, Downtown Scipio, Crystal Glades, Lawrence, residents along North County Road 500 West, and Delmar. These areas do not currently connect to a wastewater collection system or wastewater treatment facility. The residents are currently utilizing individual septic systems for on-site sanitary wastewater disposal. However, the recent non-compliance letter and notice of violation issued by IDEM identified numerous violations including septic systems that appear to directly discharge to roadside ditches. The IDEM enforcement referral, notice of violation, and agreed order can be found in **Appendix A**.

An additional area of service to be considered is the developable area along or near the US 50 By-pass north of the City of North Vernon. This area has limited access to wastewater collection facilities and proper planning should be conducted for future development of this area, all of which could likely be served by the City of North Vernon.

2.4 Description of Wastewater Treatment Facilities

2.4.1 JNRU Wastewater Treatment Plant

Treatment Plant Recent History

In 2010-2011, upgrades were made to the plant to include new fine screening, grit removal, and conversion of the sequential batch reactor process to a multi-stage aerated biological process (MSABP) which utilizes a unique fixed film media technology, patented by Aquarius Technologies. The MSABP treatment unit uses fixed media modules, fine bubble aeration, and positive displacement blowers to retain and feed aerobic bacteria colonies as the exclusive method of solids removal after the grit chamber. The improvements made the capacity of the plant to be 0.35 million gallons per day (MGD) on average with a peak operation of 1.70 (MGD).

Treatment Process Description

The JNRU WWTP is located at 3847 Country Manor West, North Vernon, Indiana, and operates under the NPDES permit IN0056049, last issued on November 5, 2020, expiring March 31, 2026.

Raw wastewater from CSL arrives to the WWTP in a 12" force main where it can optionally be immediately stored in a lagoon. There is a second 16" force main attached to the headworks that is not in use.

Raw wastewater usually enters an outdoor headworks structure containing a SAVECO fine screen with a screw press for dewatering collected solids; optionally, influent flows could enter the headworks building equipped with a Parkson rotary drum screen. However, the indoor drum screen is in poor condition due to hydrogen sulfide degradation of all equipment in the building and is only considered an emergency backup by the operators.

After influent screening, the sewage passes through a four tray HeadCell grit separator. Removed grit is pumped into the headworks building where it is settled through an Eutek

Tea Cup. When the Tea Cup is sufficiently full the settled grit is removed to a dumpster in the building. The dumpster dewaters the grit and the solids are hauled to landfill.

Wastewater flows exit the grit removal process to the MSABP unit which employs a combination of suspended and fixed film biomass growth to achieve secondary treatment. The MSABP has two separate treatment trains, each with ten individual stages. The tank configuration was intended to create spatial micro-organism successions so that no waste sludge is generated in the system. Aeration is provided to each stage of the MSABP by positive displacement blowers and fine bubble diffusers. Approximately 0.02 MGD of the MSABP effluent is diverted at the MSABP effluent to be used for the plant's non potable water supply.

After the MSABP and non-potable water diversion, the wastewater enters an earthen polishing pond with an aeration system. The polishing pond has a geo-synthetic liner. The polishing pond is currently being used as a clarifier due to the sludge load of the MSABP. The effluent of the polishing pond passes through UV disinfection prior to discharge to the Sixmile Creek.

There is one flow equalization basin that is capable of holding most of the high flows, even during wet weather. Additionally, there are two unlined lagoons that act as additional flow equalization basins. The lagoons are not needed for flow storage during regular conditions, and only needed rarely during extreme wet weather conditions. The lagoons are used for storage once per month when the polishing pond needs to be cleaned; during which, the MSABP effluent is stopped, incoming flow to the plant is routed to the lagoons, the polishing pond is dewatered to the lagoons, and the sludge is removed from the pond and collected by utility staff using hoses and shovels to be hauled to landfill. The utility has modified the polishing pond by adding a layer of concrete to the bottom to protect the lining from their shovels. The cleaning process takes approximately one week and is planned to occur during weeks that do not forecast rain; approached this way, the staff report that the lagoons do not approach critically full levels before the cleaning has finished and the flow is slowly routed back through the MSABP. The sludge elevation in the lagoons has not increased in the last ten years despite the monthly additions.

The SCADA system at the treatment plant only interfaces the WWTP; it does not communicate with the collection system lift station pumps. The emergency generator is connected to all parts of the WWTP except for the on-site lift station that pumps the lagoons up to the headworks.

Current Wastewater Flows and Loadings

Current wastewater flow and quality are shown in **Table 2.2** and **Table 2.3**, based on the Monthly Reports of Operation (MRO's) of the JNRU WWTP; MROs are included in **Appendix B**. The WWTP's NPDES effluent limits are shown in **Table 2.4**. The WWTP is rated for an average flow of 0.35 MGD and a peak flow of 1.7 MGD. Over the two years from June 2022 through August 2024, the average operating flow of the WWTP has been 0.152 MGD including wet weather flows. The maximum daily flow the WWTP has processed in the two-year period was 1.155 MGD, occurring on March 24, 2023. Although it meets its operating demand for the majority of the year, there are occasions where its average operation is pushed beyond design for approximately a week, such as the week of March 20 through March 26, 2023, when the sustained average flow was 0.426 MGD. The design average flow of 0.35 MGD currently aligns with the 97.4th percentile of 7-day average flows and the 97.5th percentile of daily flows, meaning the treatment plant only exceeded its average design capacity 2.5% (18 days) in two years.

Table 2.2
Summary of Current Flows from Country Squire Lakes Subdivisions[1]
(June 2022 – August 2024)

Category	Existing Flows (gallons per day)
Dry Weather Flows	
Domestic/Institution (D)[2]	128,839
Commercial (C)[2]	N/A
Industrial (I)[2]	N/A
Total DCI	**128,839**
Peak Sustained Infiltration[3]	90,018
Population	3,600
Peak Factor[4]	3.37
Peak DCI[4]	**434,187**
Peak Hourly Flow[5]	**524,205**
Wet Weather Flows/Current Conditions	
Average Daily Flow[6]	**152,464**
Max Daily Flow[7]	**1,155,000**

[1] The JNRU WWTP only services Country Squire Lakes which contains only domestic users. Flow is measured at the WWTP.

[2] Dry weather flows were estimated as the average flow of days that did not have rain recorded within the prior 3 days.

[3] Peak Sustained Infiltration was calculated using the largest 7-day average WWTP flow starting 3 days after a rain event. The largest average was from April 9 through April 15, 2023.. The DCI flow was subtracted from the largest 7-day average wet weather flow to determine the peak sustained infiltration.

[4] Total DCI x PF. The peaking factor (PF) was calculated from the 10 State Standards formula PF = (18+√P)/(4+√P), with P as the population in thousands.

[5] Peak Hourly Flow was calculated by multiplying the Total DCI by the peaking factor and adding the Peak Sustained Infiltration.

[6] The average daily flow determined for June 2022 to September 2024 from MRO data.

[7] 1.155 MGD was the maximum flow through the WWTP on March 24, 2023 and the facility was able to meet its NPDES permit limits.

Table 2.3
Current Influent Quality at JNRU WWTP[1]
(June 2022 – August 2024)

Category	Concentration (mg/l)		Loadings (lbs/day)	
	Average Influent	Average Effluent	Average Influent	Average Effluent
$CBOD_5$	198	3.6	252	4.6
TSS	175	10.3	218	13.3
NH_3-N	52	0.50	63	0.68
P	N/A	N/A	N/A	N/A

[1]From MRO data

Table 2.4
NPDES Limits at JNRU WWTP
(Issued 2020)

Category	Winter Limit (mg/l)		Summer Limit (mg/l)	
	Monthly Average	Weekly Average	Monthly Average	Weekly Average
$CBOD_5$	25	40	19	29
TSS	30	45	23	35
NH_3-N	1.9	2.9	1.3	1.9
P	N/A	N/A	N/A	N/A
E. Coli	125 CFU/100 ml Monthly Average Max 235 CFU/100 ml Daily Max			

Condition of the Treatment Plant

Neither the headworks building nor the collection system contain scrubbing units to remove hydrogen sulfide gas (H_2S) which is highly corrosive. Additionally, the headworks building lacks proper ventilation, which has resulted in the rapid deterioration of the equipment in the headworks building and is especially bad in the winter as the windows and bay door are closed and the H_2S makes the air quality unbreathable for more than a few minutes. The automatic valve controls in the building have broken due to the gas and all valves must be operated manually with great force. The H_2S has degraded the rotary drum screen to be unusable; the utility had the newer outdoor screw pump screen

built to bypass the headworks building as much as possible. The headworks building is required to comply with the National Fire Protection Association 820 requirements for wastewater facilities, but does not comply in terms of the required ventilation rates, hazardous area electrical classification, materials of building construction, fire suppression system, or fire alarm system.

The grit chamber is sized to process influent at a rate of 1.7 MGD, but the treatment plant rarely sees peak hourly rates over 0.5 MGD. The slow rate of flow causes the grit chamber to act more closely to a primary clarifier and settle out organic material as well as grit; the organics then putrefy and release caustic gases in the headworks and cause a large amount of floating scum on top of the grit chamber that must be removed with a vacuum pump weekly.

The aeration blower piping has at least one leak that is observable through the gravel over the buried pipe.

The non-potable water system is used, but the water comes from the MSABP tanks before the polishing tank. Because the MSABP effluent is loaded with sludge, the non-potable water filters and valves get clogged and the tank filled with sludge when the filters and valves were used. The tank now operates permanently bypassing the filters and valves.

The MSABP has been problematic since it was put into service. It did not include any practical way to remove the media for general service and maintenance. Without a true clarification system, the process for sludge removal is manual, costly, and requires the entire system to be down until complete.

Many of the automated valves and controllers either do not work anymore or were not intended to process the typical workaround procedures performed at the WWTP. As a result of the sludge processing treatment failures combined with ineffective automation, the staff spends a lot of their time manually controlling several essential procedures.

The emergency generator is in good condition; it is on a maintenance contract and has a weekly cycling schedule. The site lift station is also in good condition.

Treatment Plant NPDES Violations

The JNRU WWTP has continuously struggled to maintain compliance with NPDES permit effluent limits. In 2005, JNRU and IDEM executed an Agreed Order in Case No. 2003-13549-W, a copy of which is attached as **Appendix A**. The Agreed Order was the result of JNRU's inability to meet its permit effluent limits. As a result of the Agreed Order, the new MSABP was installed in 2011 to replace the Sequence Batch Reactor (SBR).

The MSABP design was intended to produce no waste sludge, thus no provision was made for solids separation or sludge handling in design or construction. However, waste sludge is currently being generated within the MSABP and several hundred parts per million of total suspended solids are discharged from the process as effluent. The MSABP was to meet discharge limits within a year of operation so the polishing pond could be bypassed. In 2012, a Compliance Plan was approved by IDEM which included cleaning of the MSABP. The cleaning operation was ineffective as permit violations reappeared soon after. Noncompliance, Violation, and Deficiency Letters from IDEM were received between 2015 and 2021 related to effluent limits exceedance, among other issues. See **Appendix A** for relevant correspondence.

JNRU has been forced to use the polishing pond as a clarifier because no provision was made for sludge handling. However, the polishing pond was not intended to function this way and the liner has deteriorated, and consequently the utility has applied a concrete layer to protect the bottom. Settled biological solids in the polishing pond sometimes begin to anaerobically digest, resulting in occasional effluent permit violations due to ammonia release. Very low influent wastewater temperatures also contribute to issues in maintaining nitrification during the winter months, while in summer months the warm temperature facilitates excessive bacterial growth. In the two-year study period as summarized in **Tables 2.2** and **2.3** above, the WWTP has only occasionally exceeded its NPDES ammonia and *E. Coli* effluent limits; the relative success comes at the cost of operators spending much of their time manually managing the plant functions.

2.4.2 North Vernon Wastewater Treatment Plant

Treatment Plant Recent History

In 2017, upgrades were made to the plant to add a new Wet Weather Treatment Facility. The Wet Weather Treatment Facility is part of the WWTP's CSO Long Term Control Plan Project, Phase II. The construction included new fine screening for CSO flows exceeding the peak flow of the plant, a surge basin also called a high-rate clarifier, a vortex clarification system, and a chlorine feed system.

Treatment Process Description

The North Vernon WWTP has a rated capacity of 2.2 MGD and a peak flow design of 4.76 MGD. The treatment process consists of headworks fine screening, grit removal, single stage nitrification activated sludge aeration, secondary clarification, rapid sand filtration, chlorination and de-chlorination, sludge dewatering, and land application of biosolids. When wet weather flows exceed the peak design flow, automatically controlled gates route flow to the equalization basin which has a capacity of 1,000,000 gallons for storage of the "first flush." If the equalization basin fills, flow is then directed to the surge basin that has a capacity of 187,000 gallons. From there, flow is sent to a Storm King vortex clarification system for partial treatment and chlorination and dechlorination prior to discharge at the Wet Weather Treatment Facility (CSO) Outfall 006. The mass limits for $CBOD_5$, TSS, and ammonia-nitrogen have been calculated utilizing the peak design flow of 4.76 MGD to facilitate the maximization of flow through the treatment facility. Effluent from Wet Weather Treatment Facility (CSO) Outfall 006 is only subject to quality limitations for *E. coli* and residual chlorine at the same standard as the rest of the plant; other qualities only need to be measured and reported but without limitation.

Current Wastewater Flows and Loadings

Current wastewater flow and quality are shown in **Table 2.5** based on the MROs of the North Vernon WWTP; MROs are included in **Appendix B**. The WWTP's NPDES influent design concentration is shown in **Table 2.6** and the effluent limits are shown in **Table 2.7**. Over the two years from June 2022 through June 2024, the average operating flow

of the WWTP has been 1.148 MGD including wet weather flows. The maximum daily flow the WWTP has processed in the two-year period was 4.545 MGD, occurring on January 28, 2024. The WWTP meets its operating demand for the majority of the year by using the Wet Weather Treatment Facility to process up to 2 million gallons during wet weather months. The ammonia influent is on average higher than the operating design of the treatment process, however the process is producing effluent approximately 10 times lower than the quality limit.

Table 2.5
Current Influent Quality at North Vernon WWTP[1]
(June 2022 – June 2024)

Category	Concentration (mg/l)		Loadings (lbs/day)	
	Average Influent	Average Effluent	Average Influent	Average Effluent
$CBOD_5$	131	3.5	1,121	36.7
TSS	166	8.0	1,429	86.1
NH_3-N	24.6	0.19	208	2.3
P	5.1	0.92	42.3	9.1

[1]From MRO data

Table 2.6
Design Concentrations & Loadings at
North Vernon WWTP[1]

Category	Concentration (mg/l)
	Average Influent
$CBOD_5$	200
TSS	200
NH_3-N	20
P	N/A

[1]From Construction Permit in 2014

Table 2.7
NPDES Effluent Quality Limits at North Vernon WWTP
(Issued 2019)

Category	Winter Limit (mg/l)		Summer Limit (mg/l)	
	Monthly Average	Weekly Average	Monthly Average	Weekly Average
$CBOD_5$	25	40	25	40
TSS	30	45	30	45
NH_3-N	2.2	3.3	1.5	2.2
P	NA	NA	NA	NA
Dissolved Oxygen	5.0 daily minimum		6.0 daily minimum	
Total Residual Chlorine	0.01 mg/l Monthly Average Max 0.02 mg/l Daily Max			
E. Coli	125 CFU/100 ml Monthly Average Max 235 CFU/100 ml Daily Max			

Condition of the Treatment Plant

Discussions with the WWTP operator have indicated that the operator is satisfied with the condition of the equipment and the effectiveness of the operations at the facility.

Treatment Plant NPDES Violations

The North Vernon WWTP has historically struggled to maintain compliance with its NPDES permit until the 2017 construction of the Wet Weather Treatment Facility. In the two-year study period, the WWTP has only had 3 effluent quality violations.

In June 2024, an inspection found that the sand filter treatment unit is being bypassed rather than used as it is permitted. The operator described to the auditor that the sand filter is not adequately sized for the treatment system and that they have not used it in some time. IDEM advised that the facility should consider removing the sand filter from the permit since no TSS violations had occurred in the previous 12 months. The plant occasionally exceeds its NPDES effluent limits for dissolved oxygen.

N

Graphic Scale (Feet)

0 200 400

Scale: 1" =200'

Figure 2.1

Jennings County Sanitary Master Plan

Existing JNRU Wastewater Treatment Plant

Jennings County, Indiana

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Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

Legend

- Existing Lift Station
- Existing Vacuum Station
- Existing 2" Force Main
- Existing 3" Force Main
- Existing 6" Force Main
- Existing 8" Force Main
- Existing 6" Vacuum Sewer
- Existing 8" Gravity Sewer

LS #9
VS #4
VS #6
LS #10
LS #11
VS #3
VS #2
VS #5
LS #7
VS #1
To JNRU WWTP
VS #8

N

Graphic Scale (Feet)

0 1,100 2,200

Scale: 1" =1,100'

Figure 2.2

Jennings County Sanitary Master Plan

Existing JNRU Sanitary Map

Jennings County, Indiana

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Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

Legend

Manholes

Lift Stations

Gravity Mains

Size (inches)

Unknown

6

8

10

12

15

16

18

21

24

36

Force Mains

Size (inches)

0

2

4

6

8

12

<all other values>

W County Road 500 N

N State Highway 3

N Base Rd

N County Road 75 W

W County Road 450 N

North V
Air

St A
C

N County Road 20 W

W County Road 350 N

North Vernon Byp

N 4th St

N State Highway 7

W Jfk Dr

N State Highway 3

N County Road 20 W

North Vernon Byp

W County Road 200 N

N Madison Ave

3rd St

5th St

Henry St

N State St

Summit St

E Summit St

Franklin St

Hoosier St

W O and M Ave

E O and M Ave

Hayden Pike

Buckeye St

E Buckeye St

Brownstown

North Vernon

Fords Crossing
Golf Course

Muscatatuck Force Main

North Vernon WWTP

N

Graphic Scale (Feet)

0 1,900 3,800

Scale: 1" =1,900'

Figure 2.3a

Jennings County Sanitary Master Plan

Existing North Vernon Sanitary Map (North)

Jennings County, Indiana

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Legend

- Manholes
- Lift Stations

Gravity Mains

Size (inches)

- Unknown
- 6
- 8
- 10
- 12
- 15
- 16
- 18
- 21
- 24
- 36

Force Mains

Size (inches)

- 0
- 2
- 4
- 6
- 8
- 12
- <all other values>
- North Vernon WWTP

North Vernon

North Vernon WWTP

Fords Crossing Golf Course

Violet And Louis J. Calli Nature Preserve

Muscatatuck County Park

Vernon

Vernon Fork Muscatatuck River

W O and M Ave

Hayden Pike

Wheeler Ln

N Edgewood Ave

Hicks St

N State St

E Poplar St

E Main St

Buckeye St

E Buckeye St

N Private Road 40 E

S Madison Ave

N Gum St

S Jennings St

N Greensburg St

Brownstown Rd

Campfield Ln

W Walnut St

Platter Dr

Myrtle St

W College St

Oak St

S Elm St

S State St

Greensburg St

David Dr

S Woodlawn Dr

Lincoln St

S Gum St

Dallas Dr

W Old US Highway 50

Woodfield Ct

Norris Ave

Sunnyside Dr

Davis St

Long St

Park Ave

Smith St

South St

E Norris Hts

S Norris Ave

S Gum St

N County Road 25 E

N State Highway 3

Ripley St

E County

Brown St

Jackson St

Persimmon Trail Dr

Quaker Hill Dr

W Base Rd

IGIO, Maxar, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

N

Graphic Scale (Feet)

0 1,250 2,500

Scale: 1" =1,250'

Figure 2.3b

Jennings County Sanitary Master Plan

Existing North Vernon Sanitary Map (South)

Jennings County, Indiana

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Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU - WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

Section Three – Future Situation

3.1 Current Population & Future Projections

As established in Section 2.2, the future population will be assumed to remain relatively constant. Future additional flows will come from expanding the collection system to unsewered areas.

3.2 Estimated Service Needs of Project Areas

3.2.1 JNRU Collection System Additional Connections

A summary of the anticipated needs of the JNRU service area are shown below in **Table 3.1, Table 3.2,** and **Table 3.3**. Each area was assessed for the number of homes and commercial buildings. The sewage production of each residential or business unit was determined in accordance with 327 IAC 3-6-11, that estimates average sanitary flow for a single-family home to be 310 gpd.

Table 3.1
20-Year Flow Projections for JNRU WWTP

Project Area	Customer Connections	Average Flow (gallons per day)	Existing Infrastructure Capacity
Greenacres Subdivision	72	22,320	None
Downtown Scipio - Residencial	54	16,740	None
Downtown Scipio - Commercial	6	6,770[1]	None
Crystal Glades Subdivision	71	22,010	None
Geneva Gardens	19	5,890	None
Camelot Estates	21	6,510	None
N. Co. Rd 500 West	34	10,540	None
Lawrence Subdivision	29	8,990	None
CSL Additional Customers	200	62,000	Adequate
Total Potential Additional Flow to JNRU WWTP	506	161,770	Adequate

[1]Flow includes Elementary School (300 students x 15 gpd/student), Church (~50 seats x 3 gpd/seat), Pizza Restaurant (1,000 gpd), Post Office (~6 employees x 20 gpd/employee), Auction House (~50 customers x 4 gpd/customer), Auto Repair Shop (2 restrooms x 400 gpd/rr)

Table 3.2
Expected Flows to JNRU WWTP

Category	Existing Flows (CSL Only) (gallons per day)	Expected Flows (with addition of Project Areas) (gallons per day)
Dry Weather Flows		
Domestic/Institution (D)[1]	128,839	283,839
Commercial (C)[1]	N/A	6,770
Industrial (I)[1]	N/A	N/A
Total DCI	**128,839**	**290,609**
Peak Sustained Infiltration[2]	90,018	90,018
Population	3,600	5,100
Peak Factor[3]	3.37	3.24
Peak DCI[4]	**434,187**	**941,573**
Peak Hourly Flow[5]	**524,205**	**1,031,591**
Wet Weather Flows		
Average Daily Flow[6]	**152,464**	**314,234**
Max Daily Flow[7]	**1,155,000**	**1,662,386**

[1] Dry weather flows were estimated as the average flow of days that did not have rain recorded within the prior 3 days. Future dry flows are estimated as existing flows plus future anticipated growth.

[2] Peak Sustained Infiltration was calculated using the largest 7-day average WWTP flow starting 3 days after a rain event. The largest average was from April 9 through April 15, 2023. The DCI flow was subtracted from the largest 7-day average wet weather flow to determine the peak sustained infiltration.

[3] The peaking factor (PF) was calculated from the 10 State Standards formula PF = $(18+\sqrt{P})/(4+\sqrt{P})$, with P as the population in thousands.

[4] Total DCI x PF.

[5] Peak DCI + Peak Sustained Infiltration.

[6] The Existing Average Flow determined for June 2022 to September 2024 from MRO data. Future estimate includes the average DCI of additional service areas 152,464 + (290,609 – 128,839).

[7] 1.155 MGD was the maximum flow through the WWTP on March 24, 2023 and the facility was able to meet its NPDES permit limits. Future maximum is estimated as current maximum + peak additional DCI 1,155,000 + (941,573 – 434,187)

Table 3.3
20-Year Influent Quality Estimate for JNRU WWTP

Category	Current Average Day[1]	Additional Average Day[2]	Future Total Average Day[3]
Average Flow (gpd)	152,464	161,770	314,234
$CBOD_5$ (mg/l)	198	234	218
TSS (mg/l)	176	208	194
NH_3-N (mg/l)	52	62	57
P (mg/l)	N/A	N/A	N/A

[1] The current influent qualities at JNRU WWTP per Table 2-2 including dilution by I/I.

[2] It was assumed the new collection systems would have no I/I. The dilution factor of CSL residences is the dry weather flow (128,839 gpd) / average flow (152,464 gpd) = 0.85.

[3] The total loadings of the future are a weighted average proportionate to their flow volumes.

If all of the additional service areas are added to the JNRU collection system, the existing WWTP would be operating at its upper capacity for average and peak flows. This would also increase the manual labor of the operations staff to operate and maintain the system in its current state. The WWTP will not need additional flow capacity for the near future, but will need its major treatment process, the MSABP, to be replaced or retrofitted with a more traditional treatment process that reduces manual operator interference and prepares the plant for increased influent quantity and more restrictive NPDES effluent limits.

3.2.2 North Vernon Collection System Additional Connections

A summary of the anticipated needs of the North Vernon service area are shown below in **Table 3.4** and **Table 3.5**. Each area was assessed for the number of homes and commercial buildings. The sewage production of each residential unit was determined in accordance with 327 IAC 3-6-11, which sets the average flow production of single family homes at 310 gpd.

Table 3.4
20-Year Flow Projections for North Vernon WWTP

Project Area	Customer Connections	Average Flow (gallons per day)	Existing Infrastructure Capacity
Delmar Subdivision	27	8,370	None
Bypass Service Area – Commercial[1]		160,000	None
Total Additional Flow to North Vernon WWTP	27	168,370	Adequate

[1]The Bypass Service Area will service 128 acres to the North of W Co. Rd 350 N and 60 acres to the South. Assume 85% development for a total of 160 net acres at a estimated 1,000 gpd/acre.

Table 3-5
20-Year Influent Quality Estimate for North Vernon WWTP

Category	Concentration[1] (mg/l)	Loadings[1] (lbs/day)
$CBOD_5$	131	1,266
TSS	166	1,605
NH_3-N	24.6	238
P	5.1	49

[1]The future concentration is estimated to be negligibly different from current influent qualities at North Vernon WWTP. Loadings were increased proportionate to the new flow contribution.

The North Vernon WWTP is currently operating at 1.148 MGD on average, with a rated capacity of 2.2 MGD. Its peak flow is occasionally reached due to wet weather contributions, but the Wet Weather Treatment Facility functions well to maintain compliance with the WWTP NPDES. The WWTP has treatment capacity sufficient to

process the expected additional loadings from Delmar subdivision and the Bypass Service Area with no improvements required.

Section Four – Alternatives Considered

4.1 Introduction of Alternatives

This section is provided to develop alternatives to address the current wastewater needs of Jennings County and to address current Agreed Orders with IDEM. For each alternative, a cost and effectiveness analysis was completed and meets the minimum requirements of the Water Resources Reform and Development Act of 2014 using the "real" discount rate taken from Appendix C of OMB Circular A-94 and a 20-year term.

4.2 Alternatives Considered – Wastewater Collection and Conveyance System

The wastewater collection and conveyance alternatives considered for each of the subdivisions/unsewered areas include the following:

Greenacres Subdivision Alternatives

- Alternative 1 – Proposed Gravity Sewer, Lift Station(s) and Force Main to the proposed Crystal Glades Collection System.
- Alternative 2 – Proposed Gravity Sewer including Downtown Scipio, Lift Station(s) and Force Main to the proposed Crystal Glades Collection System.
- Alternative 3 – Proposed Low Pressure Sewer, Lift Station(s) and Force Main to the proposed Crystal Glades Collection System.
- Alternative 4 – No Action

Crystal Glades Subdivision Alternatives

- Alternative 1 – Proposed Gravity Sewer, Lift Station(s) and Force Main to JNRU Lift Station #7.
- Alternative 2 – Proposed Gravity Sewer including adjacent subdivisions, Lift Station(s) and Force Main to JNRU Lift Station #7.

- Alternative 3 – Proposed Low Pressure Sewer, Lift Station and Force Main to JNRU Lift Station #7.

- Alternative 4 – No Action

North County Road 500 West Alternatives

- Alternative 1 – Proposed Gravity Sewer, Lift Station and Force Main to JNRU Lift Station #9.

- Alternative 2 – No Action

Lawrence Subdivision Alternatives

- Alternative 1 – Proposed Gravity Sewer, Lift Station and Force Main to JNRU Lift Station #7.

- Alternative 2 – Proposed Low Pressure / Grinder System with discharge to JNRU Lift Station #7

- Alternative 3 – No Action

JNRU Lift Station #7

- Alternative 1 – Proposed Structural Improvements and Pump Replacement with similar capacity

- Alternative 2 – Proposed Structural Improvements and Pump Replacement with increased capacity

- Alternative 3 – No Action

Delmar Subdivision

- Alternative 1 – Proposed Gravity Sewer, Lift Station and Force Main to North Vernon Collection System.

- Alternative 2 – No Action

US 50 Bypass Service Area

- Alternative 1 – Proposed Gravity Sewer, Lift Station and Force Main to North Vernon Collection System.
- Alternative 2 – No Action

4.2.1 Greenacres Subdivision Alternative 1 – Proposed Gravity Sewer, Lift Station(s) and Force Main to the proposed Crystal Glades Collection System

This alternative would involve the construction of approximately 7,300 lineal feet of 8" gravity sewer system within the subdivision. This gravity sewer would collect into the new primary lift station with a design capacity of 90 gpm. Due to the distance between Greenacres and the JNRU Collection System, approximately six miles, it was determined that two lift stations would be needed for this alternative. The primary lift station would be in the Southwest corner of the subdivision. The secondary lift station, also with a design capacity of 90 gpm, would be located along State Road 7 near the unincorporated area of Scipio. The secondary lift station force main would discharge into the proposed Crystal Glades gravity sewer system – therefore this alternative is contingent upon installation of sanitary collection system serving Crystal Glades. Discharging into the proposed Crystal Glades gravity sewer decreases the force main lineal footage by two miles rather than routing to the JNRU collection system and discharging to LS#7 for a total of 21,500 lineal feet. The force main will be 4" for both lift stations. Included at each lift station are provisions for odor control due to the length of force main, long detention time, and the low design flow. This alternative would address the issues with direct discharge of improperly treated wastewater by providing a connection to the JNRU system and the sewage would ultimately be treated at the JNRU WWTP. The proposed Alternative 1 system map can be seen in **Figure 4.1a&b.**

Potential environmental impacts associated with the construction and implementation of this alternative include erosion from land disturbance activities, minimal tree removal,

and the force main crossing under Nettle Creek and Sand Creek. Best practice mitigation measures will be followed to minimize these environmental impacts.

The lift station and force main for this alternative will require easement acquisition. The force main would utilize State Road 7's right of way, but there are plans for future expansion of State Road 7 that make acquiring easements for the entire route preferrable to avoid the cost of future relocation of the force main. The force main will require Horizontal Directional Drilling to cross under State Road 7.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.2.1A and 4.2.1B**. **Table 4.2.1C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $5,611,760, including contingency and the total project cost for this alternative is estimated to be $7,014,700.

4.2.2 Greenacres Subdivision Alternative 2 – Proposed Gravity Sewer including Downtown Scipio, Lift Station(s) and Force Main to the proposed Crystal Glades Collection System

This alternative would involve the construction of approximately 7,300 lineal feet of 8" gravity sewer system within the subdivision similar to Alternative 1. This gravity sewer would collect into the new primarily lift station with a design capacity of 90 gpm, also similar to Alternative 1. Due to the distance between Greenacres and the JNRU Collection System, approximately six miles, it was determined that two lift stations would be needed for this alternative. The primary lift station would be in the Southwest corner of the subdivision. The secondary lift station would be located along State Road 7 in Scipio, also similar to Alternative 1. This alternative differs from Alternative 1 as it also includes approximately 8,200 lineal feet of 8" gravity sewer in "downtown" Scipio to take advantage of the secondary lift station in the area and provide service for the existing residential and commercial users present. The secondary lift station in this alternative is slightly larger to account for the additional Scipio flow with a design capacity of 150 gpm and will discharge into the proposed Crystal Glades gravity sewer system. Discharging into the proposed Crystal Glades gravity sewer decrease the force main lineal footage by two miles rather than routing to the JNRU LS#7 collection system

for a total of 21,500 lineal feet. Thus, similar to Alternative 1, this Alternative is contingent upon constructing the proposed Crystal Glades collection system. The force main will be 4" for both lift stations. Included at each lift station are provisions for odor control due the length of force main, long detention times, and low design flow. This alternative would address the issues of direct discharge of improperly treated wastewater by providing a connection to the JNRU system and the sewage would ultimately be treated at the JNRU WWTP. The proposed Alternative 2 system map can be seen in **Figure 4.2a&b&c.**

Potential environmental impacts associated with the construction and implementation of this alternative include erosion from land disturbance activities, minimal tree removal, and the force main crossing under Nettle Creek and Sand Creek. Best practice mitigation measures will be followed to minimize these environmental impacts.

The lift station and force main for this alternative will require easement acquisition. The force main would utilize State Road 7's right of way, but there are plans for future expansion of State Road 7 that make acquiring easements for the entire route preferrable to avoid the potential for future relocation costs. The force main will require Horizontal Directional Drilling to cross under State Road 7.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.2.2A and 4.2.2B**. **Table 4.2.2C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $8,202,755, including contingency and the total project cost for this alternative is estimated to be $10,253,444.

4.2.3 Greenacres Subdivision Alternative 3 – Proposed Low Pressure Sewer, Lift Station(s) and Force Main to the proposed Crystal Glades collection system

This alternative would involve constructing approximately 6,900 lineal feet of 2" and 3" low pressure sewer system within the subdivision that would convey the sewage from each home to the primary lift station serving the subdivision. A grinder pump will be installed at each home and connected to the low-pressure sewer system. The primary lift station with a design capacity of 90 gpm would be in the Southwest corner of the subdivision. The secondary lift station with a design capacity of 90 gpm would be located

along State Road 7 in Scipio. The secondary lift station force main will discharge into the proposed Crystal Glades gravity sewer system. Discharging into the proposed Crystal Glades gravity sewer decrease the force main lineal footage by two miles rather than routing to the JNRU LS#7 collection system for a total of 21,500 lineal feet. As a result, similar to Alternative 1 and 2, this Alternative is contingent upon construction of the Crystal Glades Collection System. The force main will be 4" for both lift stations. Included at each lift station are provisions for odor control due the length of force main, long detention time, and the low design flow. This alternative would address the issues with direct discharge of improperly treated wastewater by providing a connection to the JNRU system and the sewage would ultimately be treated at JNRU WWTP. The proposed Alternative 3 system map can be seen in **Figure 4.3a&b.**

Potential environmental impacts associated with the construction and implementation of this alternative include erosion from land disturbance activities, minimal tree removal, and the force main crossing under Nettle Creek and Sand Creek. Best practice mitigation measures will be followed to minimize these environmental impacts.

The lift station and force main for this alternative will require easement acquisition. The force main would utilize State Road 7's right of way, but there are plans for future expansion of State Road 7 that make acquiring easements for the entire route preferrable to avoid potential future relocation costs. The force main will require Horizontal Directional Drilling to cross under State Road 7.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.2.3A and 4.2.3B**. **Table 4.2.3C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $4,604,765, including contingency and the total project cost for this alternative is estimated to be $5,755,956.

4.2.4 Greenacres Subdivision Alternative 4 – No Action

The "no action" alternative would involve not constructing a new wastewater collection and conveyance system. This alternative is not preferrable because it does not address the failing septic systems in the Greenacres Subdivision nor address the Agreed Order between the County and IDEM.

Table 4.2.1A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Greenacres Subdivision Alternative 1
Proposed Gravity Sewer, Lift Station(s) and Force Main to Crystal Glades Collection System
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Sanitary Sewer 8" 0-10' dp.	4,855	LF	$100	$485,500
2	Sanitary Sewer 8" 10-20' dp.	2,415	LF	$150	$362,250
3	8" x 6" Wye Sanitary Lateral Connection	72	EA	$200	$14,400
4	6" Sanitary Sewer Lateral (20' each)	1,440	LF	$75	$108,000
5	Std. MH 0-10' dp.	19	EA	$7,500	$142,500
6	Std. MH 10-20' dp.	7	EA	$12,000	$84,000
7	Drop MH	3	EA	$15,000	$45,000
8	Lift Station 1 Complete	1	EA	$350,000	$350,000
9	LS 1 Odor Control	1	EA	$50,000	$50,000
10	Lift Station 2 Complete	1	EA	$350,000	$350,000
11	LS 2 Odor Control	1	EA	$50,000	$50,000
12	LS 1 Force Main 4" (HDD Installation)	9,200	LF	$75	$690,000
13	LS 1 Force Main 4" (Creek Crossing)	200	LF	$200	$40,000
14	LS 1 Force Main 4" (Highway Crossing)	100	LF	$200	$20,000
15	LS 1 FM Air Release Valves (4" FM)	5	EA	$12,000	$60,000
16	LS 2 Force Main 4" (HDD Installation)	12,300	LF	$75	$922,500
17	LS 2 Force Main 4" (Highway Crossing)	100	LF	$200	$20,000
18	LS 2 FM Air Release Valves (4" FM)	6	EA	$12,000	$72,000
19	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
20	Utility Electrical Service to LS Allowance	2	EA	$75,000	$150,000
21	Granular Backfill	7,470	LF	$25	$186,750
22	Pavement Repair	7,270	LF	$60	$436,200
23	Drive Repair	200	LF	$100	$20,000
24	Rock Excavation (Undistributed)	180	CY	$175	$31,500
25	Erosion Control	1	LS	$50,000	$50,000
26	Maintenance of Traffic	1	LS	$20,000	$20,000
27	Additional Site Restorations	1	LS	$40,000	$40,000
28	Construction Engineering	1	LS	$40,000	$40,000
29	Mobilization and Demobilization (5%)	1	LS	$243,000	$243,000
Subtotal Construction Cost Estimate					**$5,101,600**
10% Contingency					$510,160
Total Construction Cost Estimate					**$5,611,760**
25% Non-Construction Costs					$1,402,940
Total Capital Cost (Rounded)					**$7,014,700**

Table 4.2.1B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Greenacres Subdivision Alternative 1
Proposed Gravity Sewer, Lift Station(s) and Force Main to Crystal Glades Collection System
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	New Primary Lift Station (10 HP)	$5,000
2	New Secondary Lift Station (10 HP)	$5,000
	Total Additional Power Costs	$10,000
Labor Costs		
Item	Description	Amount
1	New Primary Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
2	New Secondary Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
	Total Additional Labor Costs	$20,800
Maintenance Costs		
Item	Description	Amount
1	Outside Service + Parts (Pump/Electrical Equipment)	$5,000
	Total Additional Maintenance Costs	$5,000
Material Costs – No Additional		
	Total Additional Annual O&M Costs	**$35,800**

Table 4.2.1C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Greenacres Subdivision Alternative 1
Proposed Gravity Sewer, Lift Station(s) and Force Main to Crystal Glades Collection System
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$7,014,700**
II. Annual O&M Costs					
	Total Annual O&M Costs				$35,800
	Uniform Series Present Worth of O&M Costs (-0.5%, 20-year term)				**$755,099**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Primary Lift Station Pumps	20	3	$20,000	$40,000
2	Secondary Lift Station Pumps	20	2	$20,000	$40,000
	Single Payment Present Worth of Replacement Costs (-0.5%, Useful Life Term)				**$88,436**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Primary Lift Station Pumps	20	2	$1,000	$2,000
2	Secondary Lift Station Pumps	20	2	$1,000	$2,000
	Single Payment Present Worth of Salvage Value (-0.5%, 20-year term)				**$4,422**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $7,014,700 + $755,009 + $88,436 - $4,422				
	Net Present Worth (rounded)				**$7,853,800**

Table 4.2.2A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Greenacres Subdivision Alternative 2
Proposed Gravity Sewer including Downtown Scipio, Lift Station(s) and
Force Main to Crystal Glades Collection System
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Sanitary Sewer 8" 0-10' dp.	4,855	LF	$100	$485,500
2	Sanitary Sewer 8" 10-20' dp.	2,415	LF	$150	$362,250
3	8" x 6" Wye Sanitary Lateral Connection	72	EA	$200	$14,400
4	6" Sanitary Sewer Lateral (20' each)	1,440	LF	$75	$108,000
5	Std. MH 0-10' dp.	19	EA	$7,500	$142,500
6	Std. MH 10-20' dp.	7	EA	$12,000	$84,000
7	Drop MH	3	EA	$15,000	$45,000
8	Lift Station 1 Complete	1	EA	$350,000	$350,000
9	LS 1 Odor Control	1	EA	$50,000	$50,000
10	Sanitary Sewer 8" 0-10' dp. (Scipio)	2,200	LF	$100	$220,000
11	Sanitary Sewer 8" 10-20' dp. (Scipio)	6,000	LF	$150	$900,000
12	8" x 6" Wye Sanitary Lateral Connection (Scipio)	48	EA	$200	$9,600
13	6" Sanitary Sewer Lateral (20' each) (Scipio)	960	LF	$75	$72,000
14	Std. MH 0-10' dp. (Scipio)	9	EA	$7,500	$67,500
15	Std. MH 10-20' dp. (Scipio)	18	EA	$12,000	$216,000
16	Lift Station 2 Complete	1	EA	$350,000	$350,000
17	LS 2 Odor Control	1	EA	$75,000	$75,000
18	LS 1 Force Main 4" (HDD Installation)	9,200	LF	$75	$690,000
19	LS 1 Force Main 4" (Creek Crossing)	200	LF	$200	$40,000
20	LS 1 Force Main 4" (Highway Crossing)	100	LF	$200	$20,000
21	LS 1 FM Air Release Valves (4" FM)	5	EA	$12,000	$60,000
22	LS 2 Force Main 4" (HDD Installation)	12,300	LF	$75	$922,500
23	LS 2 Force Main 4" (Highway Crossing)	100	LF	$200	$20,000
24	LS 2 FM Air Release Valves (4" FM)	6	EA	$12,000	$72,000
25	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
26	Utility Electrical Service to LS Allowance	2	EA	$75,000	$150,000
27	Granular Backfill	15,170	LF	$25	$379,250
28	Pavement Repair	14,970	LF	$60	$898,200
29	Drive Repair	200	LF	$100	$20,000
30	Rock Excavation (Undistributed)	630	CY	$175	$110,250
31	Erosion Control	1	LS	$50,000	$50,000
32	Maintenance of Traffic	1	LS	$20,000	$20,000
33	Additional Site Restorations	1	LS	$40,000	$40,000
34	Construction Engineering	1	LS	$40,000	$40,000
35	Mobilization and Demobilization (5%)	1	LS	$355,100	$355,100

Subtotal Construction Cost Estimate	**$7,457,050**
10% Contingency	$745,705
Total Construction Cost Estimate	**$8,202,755**
25% Non-Construction Costs	$2,050,689
Total Capital Cost (Rounded)	**$10,253,444**

Table 4.2.2B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Greenacres Subdivision Alternative 2
Proposed Gravity Sewer including Downtown Scipio, Lift Station(s) and Force Main to Crystal Glades Collection System
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	New Primary Lift Station (10 HP)	$5,000
2	New Secondary Lift Station (15 HP)	$7,500
	Total Additional Power Costs	$12,500
Labor Costs		
Item	Description	Amount
1	New Primary Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
2	New Secondary Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
	Total Additional Labor Costs	$20,800
Maintenance Costs		
Item	Description	Amount
1	Outside Service + Parts (Pump/Electrical Equipment)	$5,000
	Total Additional Maintenance Costs	$5,000
Material Costs – No Additional		
	Total Additional Annual O&M Costs	**$38,300**

Table 4.2.2C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Greenacres Subdivision Alternative 2
Proposed Gravity Sewer including Downtown Scipio, Lift Station(s) and Force Main to Crystal Glades Collection System
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$10,253,444**
II. Annual O&M Costs					
	Total Annual O&M Costs				$38,300
	Uniform Series Present Worth of O&M Costs (-0.5%, 20-year term)				**$807,733**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Primary Lift Station Pumps	20	2	$20,000	$40,000
2	Secondary Lift Station Pumps	20	2	$20,000	$40,000
	Single Payment Present Worth of Replacement Costs (-0.5%, Useful Life Term)				**$88,436**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Primary Lift Station Pumps	20	2	$1,000	$2,000
2	Secondary Lift Station Pumps	20	2	$1,000	$2,000
	Single Payment Present Worth of Salvage Value (-0.5%, 20-year term)				**$4,422**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $10,253,443 + $807,733 + $88,436 - $4422				
	Net Present Worth (rounded)				**$11,145,200**

Table 4.2.3A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Greenacres Subdivision Alternative 3
Proposed Low Pressure Sewer, Lift Station(s) and Force Main to Crystal Glades Collection System
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Grinder Pumps	72	EA	$8,000	$576,000
2	Pump/Panel Installation	72	EA	$2,000	$144,000
3	Lateral Kits (Check Valve/Curb Stop Assembly)	72	EA	$1,500	$108,000
4	Air Release Valves w/ Vault	4	EA	$5,000	$20,000
5	Cleanout	5	EA	$4,000	$20,000
6	2" Pressure Pipe (HDD Installation)	4,300	LF	$30	$129,000
7	3" Pressure Pipe (HDD Installation)	2,600	LF	$36	$93,600
8	Lift Station 1 Complete	1	EA	$350,000	$350,000
9	LS 1 Odor Control	1	EA	$50,000	$50,000
10	Lift Station 2 Complete	1	EA	$350,000	$350,000
11	LS 2 Odor Control	1	EA	$50,000	$50,000
12	LS 1 Force Main 4" (HDD Installation)	9,200	LF	$75	$690,000
13	LS 1 Force Main 4" (Creek Crossing)	200	LF	$200	$40,000
14	LS 1 Force Main 4" (Highway Crossing)	100	LF	$200	$20,000
15	LS 1 FM Air Release Valves (4" FM)	1	EA	$12,000	$12,000
16	LS 2 Force Main 4" (HDD Installation)	12,300	LF	$75	$922,500
17	LS 2 FM Air Release Valves (4" FM)	5	EA	$12,000	$60,000
18	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
19	Utility Electrical Service to LS Allowance	2	EA	$75,000	$150,000
20	Granular Backfill	690	LF	$25	$17,250
21	Pavement Repair	690	LF	$60	$41,400
22	Drive Repair	200	LF	$100	$20,000
23	Rock Excavation (Undistributed)	0	CY	$175	$0
24	Erosion Control	1	LS	$35,000	$35,000
25	Maintenance of Traffic	1	LS	$15,000	$15,000
26	Additional Site Restorations	1	LS	$30,000	$30,000
27	Construction Engineering	1	LS	$25,000	$25,000
28	Mobilization and Demobilization (5%)	1	LS	$199,400	$199,400
Subtotal Construction Cost Estimate					**$4,186,150**
10% Contingency					$418,615
Total Construction Cost Estimate					**$4,604,765**
25% Non-Construction Costs					$1,151,191
Total Capital Cost (Rounded)					**$5,755,956**

Table 4.2.3B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Greenacres Subdivision Alternative 3
Proposed Low Pressure Sewer, Lift Station(s) and Force Main to Crystal Glades Collection System
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	New Primary Lift Station (10 HP)	$5,000
2	New Secondary Lift Station (10 HP)	$5,000
	Total Additional Power Costs	$10,000
Labor Costs		
Item	Description	Amount
1	New Primary Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
2	New Secondary Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
	Total Additional Labor Costs	$20,800
Maintenance Costs		
Item	Description	Amount
1	Outside Service + Parts (Pump/Electrical Equipment)	$5,000
	Total Additional Maintenance Costs	$5,000
Material Costs – No Additional		
	Total Additional Annual O&M Costs	**$35,800**

Table 4.2.3C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Greenacres Subdivision Alternative 3
Proposed Low Pressure Sewer, Lift Station(s) and Force Main to Crystal Glades Collection System
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$5,755,956**
II. Annual O&M Costs					
	Total Annual O&M Costs				$35,800
	Uniform Series Present Worth of O&M Costs (-0.5%, 20-year term)				**$755,100**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Primary Lift Station Pumps	20	2	$20,000	$40,000
2	Secondary Lift Station Pumps	20	2	$20,000	$40,000
	Single Payment Present Worth of Replacement Costs (-0.5%, Useful Life Term)				**$88,436**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Primary Lift Station Pumps	20	2	$1,000	$2,000
2	Secondary Lift Station Pumps	20	2	$1,000	$2,000
	Single Payment Present Worth of Salvage Value (-0.5%, 20-year term)				**$4,422**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $5,755,956 + $755,100 + $88,436 - $4,422				
	Net Present Worth (rounded)				**$6,595,100**

4.2.5 Crystal Glades Alternative 1 – Proposed Gravity Sewer, Lift Station(s) and Force Main to JNRU Lift Station #7

This alternative would involve the construction of approximately 6,100 lineal feet of 8" gravity sewer system within the subdivision. The subdivision is split by the lake and the dam to the south so each side of the lake requires a lift station. The primary lift station on the west side of the lake with a design capacity of 45 gpm will discharge into the gravity sewer system on the east side of the lake that feeds the secondary lift station through approximately 2,300 lineal feet of 3" force main. The secondary lift station has a design capacity of 200 gpm to include potential flows from Greenacres and Scipio. The secondary lift station pumps through approximately 11,200 lineal feet of 6" force main along State Road 7 and discharges into JNRU's Lift Station #7. Included at each lift station are provisions for odor control due the length of force main, long detention times, and the low design flow. This alternative would connect currently unsewered residents so the sewage could be treated at the JNRU WWTP. The proposed alternative system map can be seen in **Figure 4.4a&b**.

Potential environmental impacts associated with the construction and implementation of this alternative include erosion from land disturbance activities, minimal tree removal, and the force main crossing under Sixmile Creek. Best practice mitigation measures will be followed to minimize these environmental impacts.

The lift station and force main for this alternative will require easement acquisition. The force main would utilize State Road 7's right of way, but there are plans for future expansion of State Road 7 that make acquiring easements for the entire route preferrable to avoid potential future relocation costs.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.2.5A and 4.2.5B**. **Table 4.2.5C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $4,746,363, including contingency and the total project cost for this alternative is estimated to be $5,932,953.

4.2.6 Crystal Glades Alternative 2 – Proposed Gravity Sewer including adjacent subdivisions, Lift Station(s) and Force Main to JNRU Lift Station #7

This alternative would involve the construction of approximately 6,100 lineal feet of 8" gravity sewer system within the subdivision (similar to Alternative 1) plus approximately 5,000 lineal feet of 8" gravity sewer for the two adjacent subdivisions, Geneva Gardens and Camelot Estates. The Crystal Glades subdivision is split by the lake and the dam to the south, so each side of the lake requires a lift station similar to Alternative 1. The primary and secondary lift stations switch in this alternative so the secondary lift station can receive the additional flow from the adjacent subdivisions. The primary lift station in this alternative is on the east side of the lake with a design capacity of 45 gpm will discharge into the gravity sewer system on the west side of the lake that feeds the secondary lift station through approximately 2,300 lineal feet of 3" force main. The secondary lift station has a design capacity of 230 gpm to include Greenacres, Scipio, Geneva Gardens, and Camelot Estates. The secondary lift station pumps through approximately 11,200 lineal feet of 6" force main along State Road 7 and discharges into the JNRU Lift Station #7. Included at each lift station are provisions for odor control due the length of force main, long detention times, and the low design flow. This alternative would connect currently unsewered residents so the sewage could be treated at the JNRU WWTP. The proposed alternative system map can be seen in **Figure 4.5a&b**.

Potential environmental impacts associated with the construction and implementation of this alternative include erosion from land disturbance activities, minimal tree removal, and the force main crossing under Sixmile Creek. Best practice mitigation measures will be followed to minimize these environmental impacts.

The lift station and force main for this alternative will require easement acquisition. The force main would utilize State Road 7's right of way, but there are plans for future expansion of State Road 7 that make acquiring easements for the entire route preferrable to avoid potential future relocation costs.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.2.6A** and **4.2.6B**. **Table 4.2.6C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be

$6,184,668, including contingency and the total project cost for this alternative is estimated to be $7,730,834.

4.2.7 Crystal Glades Alternative 3 – Proposed Low Pressure Sewer, Lift Station and Force Main to JNRU Lift Station #7

This alternative would involve construction of approximately 6,300 lineal feet of 2" and 3" low pressure sewer system within the subdivision that would convey the sewage from each home to the proposed primary lift station for the subdivision. A grinder pump will be installed at each home and connected to the low-pressure sewer system. The proposed lift station with a design capacity of 200 gpm to include flows from Greenacres and Scipio would pump through approximately 11,200 lineal feet of 6" force main along State Road 7 and discharges into the JNRU Lift Station #7. Included at the proposed lift station are provisions for odor control due to the length of force main, long detention times, and the low design flow. This alternative would connect currently unsewered residents so the sewage could be treated at the JNRU WWTP. The proposed alternative system map can be seen in **Figure 4.6a&b.**

Potential environmental impacts associated with the construction and implementation of this alternative include erosion from land disturbance activities, minimal tree removal, and the force main crossing under Sixmile Creek. Best practice mitigation measures will be followed to minimize these environmental impacts.

The lift station and force main for this alternative will require easement acquisition. The force main would utilize State Road 7's right of way, but there are plans for future expansion of State Road 7 that make acquiring easements for the entire route preferrable to avoid potential future relocation costs.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.2.7A** and **4.2.7B**. **Table 4.2.7C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $3,251,435, including contingency and the total project cost for this alternative is estimated to be $4,064,294.

4.2.8 Crystal Glades Alternative 4 – No Action

The “no action” alternative would involve not constructing a new wastewater collection and conveyance system for this subdivision as well as the adjacent subdivision. This subdivision is not sited in the IDEM Agreed Order, but it is along the path of others which makes it a valid candidate to include for consideration. It should also be noted that if this area is not served then the Alternatives for Greenacres and Scipio as developed previously would need to change as they are contingent upon connecting to the proposed Crystal Glades system.

Table 4.2.5A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Crystal Glades Subdivision Alternative 1
Proposed Gravity Sewer, Lift Station(s) and Force Main to JNRU Lift Station #7
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Sanitary Sewer 8" 0-10' dp.	2,835	LF	$100	$283,500
2	Sanitary Sewer 8" 10-20' dp.	2,175	LF	$150	$326,250
3	Sanitary Sewer 8" +20' dp.	1,095	LF	$250	$273,750
4	8" x 6" Wye Sanitary Lateral Connection	71	EA	$200	$14,200
5	6" Sanitary Sewer Lateral (20' each)	1,420	LF	$75	$106,500
6	Std. MH 0-10' dp.	13	EA	$7,500	$97,500
7	Std. MH 10-20' dp.	6	EA	$12,000	$72,000
8	Std. MH +20' dp.	4	EA	$17,000	$68,000
9	Lift Station 1 Complete	1	EA	$350,000	$350,000
10	LS 1 Odor Control	1	EA	$50,000	$50,000
11	Lift Station 2 Complete	1	EA	$400,000	$400,000
12	LS 2 Odor Control	1	EA	$50,000	$50,000
13	LS 1 Force Main 3" (HDD Installation)	2,250	LF	$60	$135,000
14	LS 1 FM Air Release Valves (3" FM)	1	EA	$8,000	$8,000
15	LS 2 Force Main 6" (HDD Installation)	11,200	LF	$80	$896,000
16	LS 2 Force Main 6" (Creek Crossing)	300	LF	$200	$60,000
17	LS 2 FM Air Release Valves (6" FM)	5	EA	$15,000	$75,000
18	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
19	Utility Electrical Service to LS Allowance	2	EA	$75,000	$150,000
20	Granular Backfill	6,105	LF	$25	$152,625
21	Pavement Repair	5,905	LF	$60	$354,300
22	Drive Repair	200	LF	$100	$20,000
23	Rock Excavation (Undistributed)	250	CY	$175	$43,750
24	Erosion Control	1	LS	$35,000	$35,000
25	Maintenance of Traffic	1	LS	$15,000	$15,000
26	Additional Site Restorations	1	LS	$30,000	$30,000
27	Construction Engineering	1	LS	$25,000	$25,000
28	Mobilization and Demobilization (5%)	1	LS	$203,200	$203,200
Subtotal Construction Cost Estimate					**$4,314,875**
10% Contingency					$431,488
Total Construction Cost Estimate					**$4,746,363**
25% Non-Construction Costs					$1,186,591
Total Capital Cost (Rounded)					**$5,932,953**

Table 4.2.5B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Crystal Glades Subdivision Alternative 1
Proposed Gravity Sewer, Lift Station(s) and Force Main to JNRU Lift Station #7
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	New Primary Lift Station (10 HP)	$5,000
2	New Secondary Lift Station (40 HP)	$20,000
	Total Additional Power Costs	$25,000
Labor Costs		
Item	Description	Amount
1	New Primary Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
2	New Secondary Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
	Total Additional Labor Costs	$20,800
Maintenance Costs		
Item	Description	Amount
1	Outside Service + Parts (Pump/Electrical Equipment)	$5,000
	Total Additional Maintenance Costs	$5,000
Material Costs – No Additional		
	Total Additional Annual O&M Costs	**$50,800**

Table 4.2.5C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Crystal Glades Subdivision Alternative 1
Proposed Gravity Sewer, Lift Station(s) and Force Main to JNRU Lift Station #7
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$5,932,953**
II. Annual O&M Costs					
	Total Annual O&M Costs				$50,800
	Uniform Series Present Worth of O&M Costs (-0.5%, 20-year term)				**$1,071,400**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Primary Lift Station Pumps (10 HP)	20	2	$20,000	$40,000
2	Secondary Lift Station Pumps (40 HP)	20	2	$50,000	$100,000
	Single Payment Present Worth of Replacement Costs (-0.5%, Useful Life Term)				**$154,763**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Primary Lift Station Pumps (10 HP)	20	2	$1,000	$2,000
2	Secondary Lift Station Pumps (40 HP)	20	2	$5,000	$10,000
	Single Payment Present Worth of Salvage Value (-0.5%, 20-year term)				**$13,265**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $5,932,953 + $1,071,400 + $154,763 - $13,265				
	Net Present Worth (rounded)				**$7,145,900**

Table 4.2.6A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Crystal Glades Subdivision Alternative 2
Proposed Gravity Sewer including adjacent subdivisions, Lift Station(s) and Force Main to JNRU Lift Station #7
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Sanitary Sewer 8" 0-10' dp.	5,835	LF	$100	$583,500
2	Sanitary Sewer 8" 10-20' dp.	4,175	LF	$150	$626,250
3	Sanitary Sewer 8" +20' dp.	1,095	LF	$250	$273,750
4	8" x 6" Wye Sanitary Lateral Connection	111	EA	$200	$22,200
5	6" Sanitary Sewer Lateral (20' each)	2,220	LF	$75	$166,500
6	Std. MH 0-10' dp.	23	EA	$7,500	$172,500
7	Std. MH 10-20' dp.	9	EA	$12,000	$108,000
8	Std. MH +20' dp.	4	EA	$17,000	$68,000
9	Lift Station 1 Complete	1	EA	$350,000	$350,000
10	LS 1 Odor Control	1	EA	$50,000	$50,000
11	Lift Station 2 Complete	1	EA	$400,000	$400,000
12	LS 2 Odor Control	1	EA	$50,000	$50,000
13	LS 1 Force Main 2.5" (HDD Installation)	2,250	LF	$60	$135,000
14	LS 1 FM Air Release Valves (2.5" FM)	1	EA	$8,000	$8,000
15	LS 2 Force Main 6" (HDD Installation)	11,200	LF	$80	$896,000
16	LS 2 Force Main 6" (Creek Crossing)	300	LF	$200	$60,000
17	LS 2 FM Air Release Valves (6" FM)	5	EA	$15,000	$75,000
18	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
19	Utility Electrical Service to LS Allowance	2	EA	$75,000	$150,000
20	Granular Backfill	11,105	LF	$25	$277,625
21	Pavement Repair	10,905	LF	$60	$654,300
22	Drive Repair	300	LF	$100	$30,000
23	Rock Excavation (Undistributed)	400	CY	$175	$70,000
24	Erosion Control	1	LS	$35,000	$35,000
25	Maintenance of Traffic	1	LS	$15,000	$20,000
26	Additional Site Restorations	1	LS	$30,000	$30,000
27	Construction Engineering	1	LS	$25,000	$25,000
28	Mobilization and Demobilization (5%)	1	LS	$203,200	$265,500
Subtotal Construction Cost Estimate					**$5,622,425**
10% Contingency					$562,243
Total Construction Cost Estimate					**$6,184,668**
25% Non-Construction Costs					$1,546,167
Total Capital Cost (Rounded)					**$7,730,834**

Table 4.2.6B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Crystal Glades Subdivision Alternative 2
Proposed Gravity Sewer including adjacent subdivisions, Lift Station(s) and Force Main to JNRU Lift Station #7
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	New Primary Lift Station (10 HP)	$5,000
2	New Secondary Lift Station (40 HP)	$20,000
	Total Additional Power Costs	$25,000
Labor Costs		
Item	Description	Amount
1	New Primary Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
2	New Secondary Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
	Total Additional Labor Costs	$20,800
Maintenance Costs		
Item	Description	Amount
1	Outside Service + Parts (Pump/Electrical Equipment)	$5,000
	Total Additional Maintenance Costs	$5,000
Material Costs – No Additional		
	Total Additional Annual O&M Costs	**$50,800**

Table 4.2.6C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Crystal Glades Subdivision Alternative 2
Proposed Gravity Sewer including adjacent subdivisions, Lift Station(s) and Force Main to JNRU Lift Station #7
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$7,730,834**
II. Annual O&M Costs					
	Total Annual O&M Costs				$50,800
	Uniform Series Present Worth of O&M Costs (-0.5%, 20-year term)				**$1,071,400**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Primary Lift Station Pumps (10 HP)	20	2	$20,000	$40,000
2	Secondary Lift Station Pumps (40 HP)	20	2	$50,000	$100,000
	Single Payment Present Worth of Replacement Costs (-0.5%, Useful Life Term)				**$154,763**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Primary Lift Station Pumps (10 HP)	20	2	$1,000	$2,000
2	Secondary Lift Station Pumps (40 HP)	20	2	$5,000	$10,000
	Single Payment Present Worth of Salvage Value (-0.5%, 20-year term)				**$13,265**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $7,730,834 + $1,071,400 + $154,763 - $13,265				
	Net Present Worth (rounded)				**$8,943,800**

Table 4.2.7A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Crystal Glades Subdivision Alternative 3
Proposed Low Pressure Sewer, Lift Station and Force Main to JNRU Lift Station #7
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Grinder Pumps	71	EA	$8,000	$568,000
2	Pump/Panel Installation	71	EA	$2,000	$142,000
3	Lateral Kits (Check Valve/Curb Stop Assembly)	71	EA	$1,500	$106,500
4	Air Release Valves w/ Vault	3	EA	$5,000	$15,000
5	Cleanout	8	EA	$4,000	$32,000
6	2" Pressure Pipe (HDD Installation)	3,800	LF	$30	$114,000
7	3" Pressure Pipe (HDD Installation)	2,500	LF	$36	$90,000
8	Lift Station Complete	1	EA	$400,000	$400,000
9	LS Odor Control	1	EA	$50,000	$50,000
10	LS Force Main 6" (HDD Installation)	11,200	LF	$80	$896,000
11	LS Force Main 6" (Creek Crossing)	300	LF	$200	$60,000
12	LS FM Air Release Valves (6" FM)	5	EA	$15,000	$75,000
13	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
14	Utility Electrical Service to LS Allowance	1	EA	$75,000	$75,000
15	Granular Backfill	630	LF	$25	$15,750
16	Pavement Repair	630	LF	$60	$37,800
17	Drive Repair	200	LF	$100	$20,000
18	Rock Excavation (Undistributed)	0	CY	$175	$0
19	Erosion Control	1	LS	$35,000	$35,000
20	Maintenance of Traffic	1	LS	$10,000	$10,000
21	Additional Site Restorations	1	LS	$30,000	$30,000
22	Construction Engineering	1	LS	$25,000	$25,000
23	Mobilization and Demobilization (5%)	1	LS	$140,800	$140,800
Subtotal Construction Cost Estimate					**$2,955,850**
10% Contingency					$295,585
Total Construction Cost Estimate					**$3,251,435**
25% Non-Construction Costs					$812,859
Total Capital Cost (Rounded)					**$4,064,294**

Table 4.2.7B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Crystal Glades Subdivision Alternative 3
Proposed Low Pressure Sewer, Lift Station and Force Main to JNRU Lift Station #7
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	New Proposed Lift Station (40 HP)	$20,000
	Total Additional Power Costs	$20,000
Labor Costs		
Item	Description	Amount
1	New Proposed Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
	Total Additional Labor Costs	$10,400
Maintenance Costs		
Item	Description	Amount
1	Outside Service + Parts (Pump/Electrical Equipment)	$5,000
	Total Additional Maintenance Costs	$5,000
Material Costs – No Additional		
	Total Additional Annual O&M Costs	**$35,400**

Table 4.2.7C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Crystal Glades Subdivision Alternative 3
Proposed Low Pressure Sewer, Lift Station(s) and Force Main to JNRU Lift Station #7
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$4,064,294**
II. Annual O&M Costs					
	Total Annual O&M Costs				$35,400
	Uniform Series Present Worth of O&M Costs (-0.5%, 20-year term)				**$746,600**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Primary Lift Station Pumps (10 HP)	20	2	$20,000	$40,000
2	Secondary Lift Station Pumps (40 HP)	20	2	$50,000	$100,000
	Single Payment Present Worth of Replacement Costs (-0.5%, Useful Life Term)				**$154,763**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Primary Lift Station Pumps (10 HP)	20	2	$1,000	$2,000
2	Secondary Lift Station Pumps (40 HP)	20	2	$5,000	$10,000
	Single Payment Present Worth of Salvage Value (-0.5%, 20-year term)				**$13,265**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $4,064,294 + $746,600 + $154,763 - $13,265				
	Net Present Worth (rounded)				**$4,952,400**

4.2.9 North County Road 500 West Alternative 1 – Proposed Gravity Sewer, Lift Station and Force Main to JNRU Lift Station #9

While not cited in the IDEM Agreed Order or Notices of Violation, discussions with the County leaders and the Count Health Department, it was determined that there are potentially failing septic systems in this area and thus it should be considered for service similar to the other subdivisions. This alternative would involve construction of approximately 4,200 lineal feet of 8" gravity sewer system along North County Road 500 West starting at West County Road 500 North and running south. This gravity sewer would collect into the proposed lift station with a design capacity of 30 gpm. The 2" force main from the proposed lift station will discharge into the JNRU LS#9 collection system for a total of 2,200 lineal feet. This alternative would address the perceived issues of direct discharge of improperly treated wastewater by providing a connection to the JNRU system and the sewage would ultimately be treated at the JNRU WWTP. The proposed alternative system map can be seen in **Figure 4.7**.

Potential environmental impacts associated with the construction and implementation of this alternative include erosion from land disturbance activities, and minimal tree removal. Best practice mitigation measures will be followed to minimize these environmental impacts.

The lift station and force main for this alternative will require easement acquisition.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.2.9A** and **4.2.9B**. **Table 4.2.9C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $2,059,338, including contingency and the total project cost for this alternative is estimated to be $2,574,172.

4.2.10 North County Road 500 West Alternative 2 – No Action

The "no action" alternative would involve not constructing a new wastewater collection and conveyance system for this developed area of the County. While this area is not cited in the IDEM Agreed Order, County Officials indicated that there are likely failing septic systems in the area and it should be considered for sanitary service. Ultimately,

this area is not one of the primary areas of need as compared to other areas evaluation herein.

Table 4.2.9A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
North County Road 500 West Alternative 1
Proposed Gravity Sewer, Lift Station and Force Main to JNRU Lift Station #9
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Sanitary Sewer 8" 0-10' dp.	3,500	LF	$100	$350,000
2	Sanitary Sewer 8" 10-20' dp.	700	LF	$150	$105,000
3	8" x 6" Wye Sanitary Lateral Connection	34	EA	$200	$6,800
4	6" Sanitary Sewer Lateral (20' each)	680	LF	$75	$51,000
5	Std. MH 0-10' dp.	11	EA	$7,500	$82,500
6	Std. MH 10-20' dp.	2	EA	$12,000	$24,000
7	Lift Station Complete	1	EA	$350,000	$350,000
8	LS Odor Control	1	EA	$50,000	$50,000
9	LS Force Main 2" (HDD Installation)	4,700	LF	$50	$235,000
10	LS Force Main 2" (Creek Crossing)	100	LF	$200	$20,000
11	LS FM Air Release Valves (2" FM)	2	EA	$8,000	$16,000
12	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
13	Utility Electrical Service to LS Allowance	1	EA	$75,000	$75,000
14	Granular Backfill	4,000	LF	$25	$100,000
15	Pavement Repair	3,800	LF	$60	$228,000
16	Drive Repair	100	LF	$100	$10,000
17	Rock Excavation (Undistributed)	55	CY	$175	$9,625
18	Erosion Control	1	LS	$25,000	$25,000
19	Maintenance of Traffic	1	LS	$10,000	$10,000
20	Additional Site Restorations	1	LS	$2,000	$2,000
21	Construction Engineering	1	LS	$15,000	$15,000
22	Mobilization and Demobilization (5%)	1	LS	$89,200	$89,200
Subtotal Construction Cost Estimate					**$1,872,125**
10% Contingency					$187,213
Total Construction Cost Estimate					**$2,059,338**
25% Non-Construction Costs					$514,834
Total Capital Cost (Rounded)					**$2,574,172**

Table 4.2.9B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
North County Road 500 West Alternative 1
Proposed Gravity Sewer, Lift Station and Force Main to JNRU Lift Station #9
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	New Proposed Lift Station (10 HP)	$5,000
	Total Additional Power Costs	$5,000
Labor Costs		
Item	Description	Amount
1	New Proposed Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
	Total Additional Labor Costs	$10,400
Maintenance Costs		
Item	Description	Amount
1	Outside Service + Parts (Pump/Electrical Equipment)	$5,000
	Total Additional Maintenance Costs	$5,000
Material Costs – No Additional		
	Total Additional Annual O&M Costs	**$20,400**

Table 4.2.9C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
North County Road 500 West Alternative 1
Proposed Gravity Sewer, Lift Station and Force Main to JNRU Lift Station #9
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$2,574,172**
II. Annual O&M Costs					
	Total Annual O&M Costs				$20,400
	Uniform Series Present Worth of O&M Costs (-0.5%, 20-year term)				**$430,300**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Lift Station Pumps (10 HP)	20	2	$20,000	$40,000
	Single Payment Present Worth of Replacement Costs (-0.5%, Useful Life Term)				**$44,218**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Lift Station Pumps (10 HP)	20	2	$1,000	$2,000
	Single Payment Present Worth of Salvage Value (-0.5%, 20-year term)				**$2,211**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $2,574,172 + $430,300 + $44,218 - $2,210				
	Net Present Worth (rounded)				**$3,046,500**

4.2.11 Lawrence Subdivision Alternative 1 – Proposed Gravity Sewer, Lift Station and Force Main to JNRU Lift Station #7

This alternative would involve construction of approximately 2,600 lineal feet of 8" gravity sewer system within the subdivision. This gravity sewer would convey flows northeasterly and collect into the proposed lift station with a design capacity of 30 gpm. The 4" force main from the proposed lift station will discharge into the JNRU Lift Station #7 collection system for a total of 2,200 lineal feet. This alternative would address the issues with direct discharge of improperly treated wastewater due to failing septic system in in the subdivision by providing a connection to the JNRU system and the sewage would ultimately be treated at the JNRU WWTP. The proposed alternative system map can be seen in **Figure 4.8**.

Potential environmental impacts associated with the construction and implementation of this alternative include erosion from land disturbance activities, minimal tree removal, and construction near the 100-year flood zone (near the proposed lift station). Best practice mitigation measures will be followed to minimize these environmental impacts.

The lift station and force main for this alternative will require easement acquisition. The force main would cross State Road 7 via a directionally drilled installation of the force main in an HDPE casing.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.2.11A** and **4.2.11B**. **Table 4.2.11C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $1,459,728, including contingency and the total project cost for this alternative is estimated to be $1,824,659.

4.2.12 Lawrence Subdivision Alternative 2 – Proposed Low Pressure Sewer System with discharge to JNRU Lift Station #7

This alternative would involve constructing approximately 3,000 lineal feet of 2" and 3" low pressure sewer system within the subdivision that would convey the sewage from each home directly to the JNRU Lift Station #7 collection system – including a directionally drilled crossing of SR 7 similar to Alternative 1. A grinder pump will be

installed at each home and connected to the low-pressure sewer system. This alternative would address the issues with direct discharge of improperly treated wastewater due to failing septic systems in the subdivision by providing a connection to the JNRU system and the sewage would ultimately be treated at the JNRU WWTP. The proposed alternative system map can be seen in **Figure 4.9.**

Potential environmental impacts associated with the construction and implementation of this alternative include erosion from land disturbance activities, minimal tree removal, and construction near the 100-year flood zone. Best practice mitigation measures will be followed to minimize these environmental impacts.

The low-pressure sewer for this alternative should not require easement acquisition. WHERE??? The force main would cross SR 7 via a directionally drilled installation of the force main in an HDPE casing with connection ultimately in the JNRU Lift Station #7.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.2.12A** and **4.2.12B**. **Table 4.2.12C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $706,695, including contingency and the total project cost for this alternative is estimated to be $883,369.

4.2.13 Lawrence Alternatives 3 – No Action

The “no action” alternative would involve not constructing a new wastewater collection and conveyance system for the subdivision. This alternative is not preferrable because it does not address the failing septic systems nor address the Agreed Order with IDEM. Additionally, this subdivision is one of the higher priority areas due to degree of non-compliance of homes in the subdivision with respect to performance of existing septic systems.

Table 4.2.11A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Lawrence Subdivision Alternative 1
Proposed Gravity Sewer, Lift Station and Force Main to JNRU Lift Station #7
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Sanitary Sewer 8" 0-10' dp.	2,385	LF	$100	$238,500
2	Sanitary Sewer 8" 10-20' dp.	245	LF	$150	$36,750
3	8" x 6" Wye Sanitary Lateral Connection	29	EA	$200	$5,800
4	6" Sanitary Sewer Lateral (20' each)	580	LF	$75	$43,500
5	Std. MH 0-10' dp.	10	EA	$7,500	$75,000
6	Std. MH 10-20' dp.	1	EA	$12,000	$12,000
7	Lift Station Complete	1	EA	$350,000	$350,000
8	LS Force Main 2" (HDD Installation)	2,150	LF	$50	$107,500
9	LS Force Main 2" (Highway Crossing)	100	LF	$200	$20,000
10	LS FM Air Release Valves (2" FM)	0	EA	$8,000	$0
11	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
12	Utility Electrical Service to LS Allowance	1	EA	$75,000	$75,000
13	Granular Backfill	2,615	LF	$25	$65,375
14	Pavement Repair	2,515	LF	$60	$150,900
15	Drive Repair	100	LF	$100	$10,000
16	Rock Excavation (Undistributed)	20	CY	$175	$3,500
17	Erosion Control	1	LS	$25,000	$25,000
18	Maintenance of Traffic	1	LS	$10,000	$10,000
19	Additional Site Restorations	1	LS	$2,000	$2,000
20	Construction Engineering	1	LS	$15,000	$15,000
21	Mobilization and Demobilization (5%)	1	LS	$63,200	$63,200
Subtotal Construction Cost Estimate					**$1,327,025**
10% Contingency					$132,703
Total Construction Cost Estimate					**$1,459,728**
25% Non-Construction Costs					$364,932
Total Capital Cost (Rounded)					**$1,824,659**

Table 4.2.11B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Lawrence Subdivision Alternative 1
Proposed Gravity Sewer, Lift Station and Force Main to JNRU Lift Station #7Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	New Proposed Lift Station (10 HP)	$5,000
	Total Additional Power Costs	$5,000
Labor Costs		
Item	Description	Amount
1	New Proposed Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
	Total Additional Labor Costs	$10,400
Maintenance Costs		
Item	Description	Amount
1	Outside Service + Parts (Pump/Electrical Equipment)	$5,000
	Total Additional Maintenance Costs	$5,000
Material Costs – No Additional		
	Total Additional Annual O&M Costs	**$20,400**

Table 4.2.11C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Lawrence Subdivision Alternative 1
Proposed Gravity Sewer, Lift Station and Force Main to JNRU Lift Station #7
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$1,824,659**
II. Annual O&M Costs					
	Total Annual O&M Costs				$20,400
	Uniform Series Present Worth of O&M Costs (-0.5%, 20-year term)				**$430,300**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Lift Station Pumps (10 HP)	20	2	$20,000	$40,000
	Single Payment Present Worth of Replacement Costs (-0.5%, Useful Life Term)				**$44,218**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Lift Station Pumps (10 HP)	20	2	$1,000	$2,000
	Single Payment Present Worth of Salvage Value (-0.5%, 20-year term)				**$2,211**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $1,824,659 + $430,300 + $44,218 - $2,210				
	Net Present Worth (rounded)				**$2,297,000**

Table 4.2.12A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Lawrence Subdivision Alternative 2
Proposed Low Pressure Sewer, Lift Station and Force Main to JNRU Lift Station #7
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Grinder Pumps	29	EA	$8,000	$232,000
2	Pump/Panel Installation	29	EA	$2,000	$58,000
3	Lateral Kits (Check Valve/Curb Stop Assembly)	29	EA	$1,500	$43,500
4	Air Release Valves w/ Vault	0	EA	$5,000	$0
5	Cleanout	8	EA	$4,000	$32,000
6	2" Pressure Pipe (HDD Installation)	2,500	LF	$35	$87,500
7	3" Pressure Pipe (HDD Installation)	500	LF	$45	$22,500
8	3" Pressure Pipe (Highway Crossing)	100	LF	$300	$30,000
9	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
10	Granular Backfill	310	LF	$25	$7,750
11	Pavement Repair	310	LF	$60	$18,600
12	Drive Repair	100	LF	$100	$10,000
13	Rock Excavation (Undistributed)	0	CY	$175	$0
14	Erosion Control	1	LS	$25,000	$25,000
15	Maintenance of Traffic	1	LS	$10,000	$10,000
16	Additional Site Restorations	1	LS	$2,000	$2,000
17	Construction Engineering	1	LS	$15,000	$15,000
18	Mobilization and Demobilization (5%)	1	LS	$30,600	$30,600
Subtotal Construction Cost Estimate					**$642,450**
10% Contingency					$64,245
Total Construction Cost Estimate					**$706,695**
25% Non-Construction Costs					$176,674
Total Capital Cost (Rounded)					**$883,369**

Table 4.2.12B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Lawrence Subdivision Alternative 2
Proposed Low Pressure Sewer, Lift Station and Force Main to JNRU Lift Station #7
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	None	
	Total Additional Power Costs	
Labor Costs		
Item	Description	Amount
1	New Low Pressure Force Main Labor: 2 hr/week @ $50/hr =	$5,200
	Total Additional Labor Costs	$5,200
Maintenance Costs		
Item	Description	Amount
1	None	
	Total Additional Maintenance Costs	
Material Costs – No Additional		
	Total Additional Annual O&M Costs	**$5,200**

Table 4.2.12C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Lawrence Subdivision Alternative 2
Proposed Low Pressure Sewer, Lift Station and Force Main to JNRU Lift Station #7
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$883,369**
II. Annual O&M Costs					
	Total Annual O&M Costs				$5,200
	Uniform Series Present Worth of O&M Costs (-0.5%, 20-year term)				**$109,700**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	None				$0
	Single Payment Present Worth of Replacement Costs (-0.5%, Useful Life Term)				**$0**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	None				$0
	Single Payment Present Worth of Salvage Value (-0.5%, 20-year term)				**$0**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $883,369 + $109,700 + $0 - $0				
	Net Present Worth (rounded)				**$993,100**

4.2.14 JNRU Lift Station #7 Alternative 1 – Proposed Structural Improvements and Pump Replacement with similar capacity

The existing Lift Station #7 in the JNRU system is a typical duplex submersible type station with a valve vault. The station has capacity concerns due to upstream I/I as well as infiltration of the existing pre-cast structure due to deterioration of the structure. Additionally, as noted previously, this station is identified as a discharge location for multiple Alternatives to provide sanitary service to new areas. Records show that LS#7 pumps have a design capacity of 113 gpm. This capacity is adequate to add proposed Lawrence Subdivision sanitary flows. However, in order to include Greenacres, Scipio,

Crystal Glades and adjacent Geneva Gardens and Camelot Estates; the pumping capacity would need to double and likely require a larger wet well.

The current planned improvements in this alternative include replacing the existing pumps to match the existing designed capacity, replacing the existing level switches, replacing and relocating the electrical control panel to meet current electrical code, and structural repairs to the existing gravity sewer penetration into the wet well. During site visits, there was visible infiltration through this penetration. This alternative would provide assurances to the JNRU conveyance system due to the added flow to the system. The proposed improvements can be seen in **Figure 4.10**.

Potential environmental impacts associated with the construction and implementation of this alternative include erosion from land disturbance activities, and minimal tree removal. Best practice mitigation measures will be followed to minimize these environmental impacts.

Lift Station #7 does not seem to currently be in an easement. The access drive and lift station will require easement acquisition.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.2.14A** and **4.2.14B**. **Table 4.2.14C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $329,230, including contingency and the total project cost for this alternative is estimated to be $411,538.

4.2.15 JNRU Lift Station #7 Alternative 2 – Proposed Structural Improvements and Pump Replacement with increased capacity

The current planned improvements in this alternative include replacing the existing pumps with a higher capacity to handle the additional service areas, replacing the existing level switches, replacing and relocating the electrical control panel to meet current electrical code, and structural repairs to the existing gravity sewer penetration into the wet well. During site visits, there was visible infiltration through this penetration. This alternative would provide assurances to the JNRU conveyance system due to the added flow to the system. The proposed improvements can be seen in **Figure 4.10**.

Potential environmental impacts associated with the construction and implementation of this alternative include erosion from land disturbance activities, and minimal tree removal. Best practice mitigation measures will be followed to minimize these environmental impacts.

Lift Station #7 does not seem to currently be in an easement. The access drive and lift station will require easement acquisition.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in Table 4.2.15A and 4.2.15B. Table 4.2.15C shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $444,730, including contingency and the total project cost for this alternative is estimated to be $555,913.

4.2.16 JNRU Lift Station #7 Alternative 3 – No Action

The "no action" alternative would involve not making any improvements to the JNRU Lift Station #7. While the existing capacity appears to be adequate for adding flows from the Lawrence Subdivision, it will not handle any additional subdivision flows. This alternative, also, does not address the significant infiltration into the wet well nor the electrical control panel code violations.

Table 4.2.14A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU Lift Station #7 Alternative 1
Proposed Structural Improvements and Pump Replacement with similar capacity
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Site Work	1	LS	$25,000	$25,000
2	Structural & Pump Upgrades	1	LS	$150,000	$150,000
3	Electrical	1	LS	$75,000	$75,000
4	Erosion Control	1	LS	$10,000	$10,000
5	Miscellaneous	1	LS	$25,000	$25,000
6	Mobilization and Demobilization (5%)	1	LS	$14,300	$14,300
Subtotal Construction Cost Estimate					**$299,300**
10% Contingency					$29,930
Total Construction Cost Estimate					**$329,230**
25% Non-Construction Costs					$82,308
Total Capital Cost (Rounded)					**$411,538**

Table 4.2.14B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU Lift Station #7 Alternative 1
Proposed Structural Improvements and Pump Replacement with similar capacity
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	None	
	Total Additional Power Costs	$0
Labor Costs		
Item	Description	Amount
1	None	
	Total Additional Labor Costs	$0
Maintenance Costs		
Item	Description	Amount
1	None	
	Total Additional Maintenance Costs	$0
Material Costs – No Additional		
	Total Additional Annual O&M Costs	**$0**

Table 4.2.14C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU Lift Station #7 Alternative 1
Proposed Structural Improvements and Pump Replacement with similar capacity
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$411,538**
II. Annual O&M Costs					
	Total Annual O&M Costs				$0
	Uniform Series Present Worth of O&M Costs (-0.5%, 20-year term)				**$0**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Lift Station Pumps (15 HP)	20	2	$25,000	$50,000
	Single Payment Present Worth of Replacement Costs (-0.5%, Useful Life Term)				**$55,272**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Lift Station Pumps (15 HP)	20	2	$1,500	$3,000
	Single Payment Present Worth of Salvage Value (-0.5%, 20-year term)				**$3,316**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $411,538 + $0 + $55,272 - $3,316				
	Net Present Worth (rounded)				**$463,500**

Table 4.2.15A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU Lift Station #7 Alternative 2
Proposed Structural Improvements and Pump Replacement with increased capacity
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Site Work	1	LS	$25,000	$25,000
2	Structural & Pump Upgrades	1	LS	$250,000	$250,000
3	Electrical	1	LS	$75,000	$75,000
4	Erosion Control	1	LS	$10,000	$10,000
5	Miscellaneous	1	LS	$25,000	$25,000
6	Mobilization and Demobilization (5%)	1	LS	$14,300	$19,300
Subtotal Construction Cost Estimate					**$404,300**
10% Contingency					$40,430
Total Construction Cost Estimate					**$444,730**
25% Non-Construction Costs					$111,183
Total Capital Cost (Rounded)					**$555,913**

Table 4.2.15B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU Lift Station #7 Alternative 2
Proposed Structural Improvements and Pump Replacement with increased capacity
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	Increased Capacity Pumps (50 HP vs 15 HP)	$20,000
	Total Additional Power Costs	$20,000
Labor Costs		
Item	Description	Amount
1	None	
	Total Additional Labor Costs	$0
Maintenance Costs		
Item	Description	Amount
1	None	
	Total Additional Maintenance Costs	$0
Material Costs – No Additional		
	Total Additional Annual O&M Costs	**$20,000**

Table 4.2.15C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU Lift Station #7 Alternative 2
Proposed Structural Improvements and Pump Replacement with increased capacity
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$555,913**
II. Annual O&M Costs					
	Total Annual O&M Costs				$20,000
	Uniform Series Present Worth of O&M Costs (-0.5%, 20-year term)				**$421,800**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Lift Station Pumps (50 HP)	20	2	$75,000	$150,000
	Single Payment Present Worth of Replacement Costs (-0.5%, Useful Life Term)				**$165,817**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Lift Station Pumps (50 HP)	20	2	$6,500	$13,000
	Single Payment Present Worth of Salvage Value (-0.5%, 20-year term)				**$14,371**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $555,913 + $421,800 + $165,817 - $14,371				
	Net Present Worth (rounded)				**$1,129,200**

4.2.17 Delmar Subdivision Alternative 1 – Proposed Gravity Sewer, Lift Station and Force Main to North Vernon Collection System

This alternative would involve construction of approximately 2,400 lineal feet of 8" gravity sewer system within the subdivision. This gravity sewer would collect and convey flows to the proposed lift station with a design capacity of 45 gpm. The 3" force main from the proposed lift station will discharge into the North Vernon collection system at Middle School Drive for a total of 4,600 lineal feet. The North Vernon Sanitary Department currently has plans to improve the lift station that this collection system discharges into, so no additional improvement to the existing North Vernon conveyance system are considered. This alternative would address the issues with direct discharge of improperly treated wastewater due to failing on-site septic systems by providing a

connection to the North Vernon system and the sewage would ultimately be treated at the North Vernon WWTP. The proposed alternative system map can be seen in **Figure 4.11**.

Potential environmental impacts associated with the construction and implementation of this alternative include erosion from land disturbance activities, and minimal tree removal. Best practice mitigation measures will be followed to minimize these environmental impacts.

The lift station for this alternative will require easement acquisition. The force main would utilize the US-50's right of way.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.2.17A** and **4.2.17B**. **Table 4.2.17C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $1,698,400, including contingency and the total project cost for this alternative is estimated to be $2,123,000.

4.2.18 Delmar Subdivision Alternative 2 – No Action

The "no action" alternative would involve not constructing a new wastewater collection and conveyance system. This alternative is not preferrable because it does not address the failing septic systems nor address the Agreed Order with IDEM as this subdivision was one of the primary areas noted as being non-compliant with respect to wastewater treatment.

Table 4.2.17A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Delmar Subdivision Alternative 1
Proposed Gravity Sewer, Lift Station and Force Main North Vernon Collection System
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Sanitary Sewer 8" 0-10' dp.	1,440	LF	$100	$144,000
2	Sanitary Sewer 8" 10-20' dp.	930	LF	$150	$139,500
3	8" x 6" Wye Sanitary Lateral Connection	27	EA	$200	$5,400
4	6" Sanitary Sewer Lateral (20' each)	540	LF	$75	$40,500
5	Std. MH 0-10' dp.	7	EA	$7,500	$52,500
6	Std. MH 10-20' dp.	3	EA	$12,000	$36,000
7	Lift Station Complete	1	EA	$350,000	$350,000
8	LS Odor Control	1	EA	$50,000	$50,000
9	LS Force Main 3" (HDD Installation)	4,580	LF	$60	$274,800
10	LS FM Air Release Valves (3" FM)	2	EA	$8,000	$16,000
11	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
12	Utility Electrical Service to LS Allowance	1	EA	$75,000	$75,000
13	Granular Backfill	2,370	LF	$25	$59,250
14	Pavement Repair	2,170	LF	$60	$130,200
15	Drive Repair	150	LF	$100	$15,000
16	Rock Excavation (Undistributed)	70	CY	$175	$12,250
17	Erosion Control	1	LS	$25,000	$25,000
18	Maintenance of Traffic	1	LS	$10,000	$10,000
19	Additional Site Restorations	1	LS	$2,000	$2,000
20	Construction Engineering	1	LS	$15,000	$15,000
21	Mobilization and Demobilization (5%)	1	LS	$73,600	$73,600
Subtotal Construction Cost Estimate					**$1,544,000**
10% Contingency					$154,400
Total Construction Cost Estimate					**$1,698,400**
25% Non-Construction Costs					$424,600
Total Capital Cost (Rounded)					**$2,123,000**

Table 4.2.17B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Delmar Subdivision Alternative 1
Proposed Gravity Sewer, Lift Station and Force Main to North Vernon Collection System
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	New Proposed Lift Station (10 HP)	$5,000
	Total Additional Power Costs	$5,000
Labor Costs		
Item	Description	Amount
1	New Proposed Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
	Total Additional Labor Costs	$10,400
Maintenance Costs		
Item	Description	Amount
1	Outside Service + Parts (Pump/Electrical Equipment)	$5,000
	Total Additional Maintenance Costs	$5,000
Material Costs – No Additional		
	Total Additional Annual O&M Costs	**$20,400**

Table 4.2.17C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Delmar Subdivision Alternative 1
Proposed Gravity Sewer, Lift Station and Force Main North Vernon Collection System
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$2,123,000**
II. Annual O&M Costs					
	Total Annual O&M Costs				$20,400
	Uniform Series Present Worth of O&M Costs (-0.5%, 20-year term)				**$430,300**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Lift Station Pumps (10 HP)	20	2	$20,000	$40,000
	Single Payment Present Worth of Replacement Costs (-0.5%, Useful Life Term)				**$44,218**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Lift Station Pumps (10 HP)	20	2	$1,000	$2,000
	Single Payment Present Worth of Salvage Value (-0.5%, 20-year term)				**$2,211**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $2,123,000 + $430,300 + $44,218 - $2,210				
	Net Present Worth (rounded)				**$2,595,400**

4.2.19 US 50 Bypass Service Area Alternative 1 – Proposed Gravity Sewer, Lift Station and Force Main to North Vernon Collection System

The recently constructed US 50 By-pass on the north side of the City of North Vernon has opened up a large area for potential development of various types. While no development is currently imminent, County and City leaders are interested in a plan to provide wastewater service to areas that could develop given the limited infrastructure that currently exists in that areas that serves the Airport, Golf Course and some isolated industries. This alternative would involve construction of approximately 3,900 lineal feet of 8" gravity sewer system along West County Road 350 North starting at North County Road 75 West and running west to North State Road 3. This gravity sewer would collect and convey wastewater to a proposed lift station with a design capacity of 450 gpm. The 6" force main from the proposed lift station will convey flows a total of 2,700 lineal feet to discharge into the North Vernon 12" gravity sewer. This alternative offers a plan to provide wastewater service to new commercial/industrial developments with the understanding that the plan could change depending upon the location and needs of future development in the By-pass area.. The proposed alternative system map can be seen in **Figure 4.12**.

Potential environmental impacts associated with the construction and implementation of this alternative include erosion from land disturbance activities, and minimal tree removal. Best practice mitigation measures will be followed to minimize these environmental impacts.

The lift station for this alternative will require easement acquisition. The force main would utilize the North State Road 3's right of way.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.2.19A** and **4.2.19B**. **Table 4.2.19C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $2,115,960, including contingency and the total project cost for this alternative is estimated to be $2,644,950.

4.2.20 US 50 Bypass Service Area Alternative 2 – No Action

The “no action” alternative would involve not constructing a new wastewater collection and conveyance system. This alternative is not preferrable because it does not encourage new commercial/industrial developments into the area, however, since there is not imminent development seeking service, the “No Action” alternative may be a consideration until development is planned to avoid capital expenditures at this time.

Table 4.2.19A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
US 50 Bypass Service Area Alternative 1
Proposed Gravity Sewer, Lift Station and Force Main North Vernon Collection System
Estimated Capital Costs

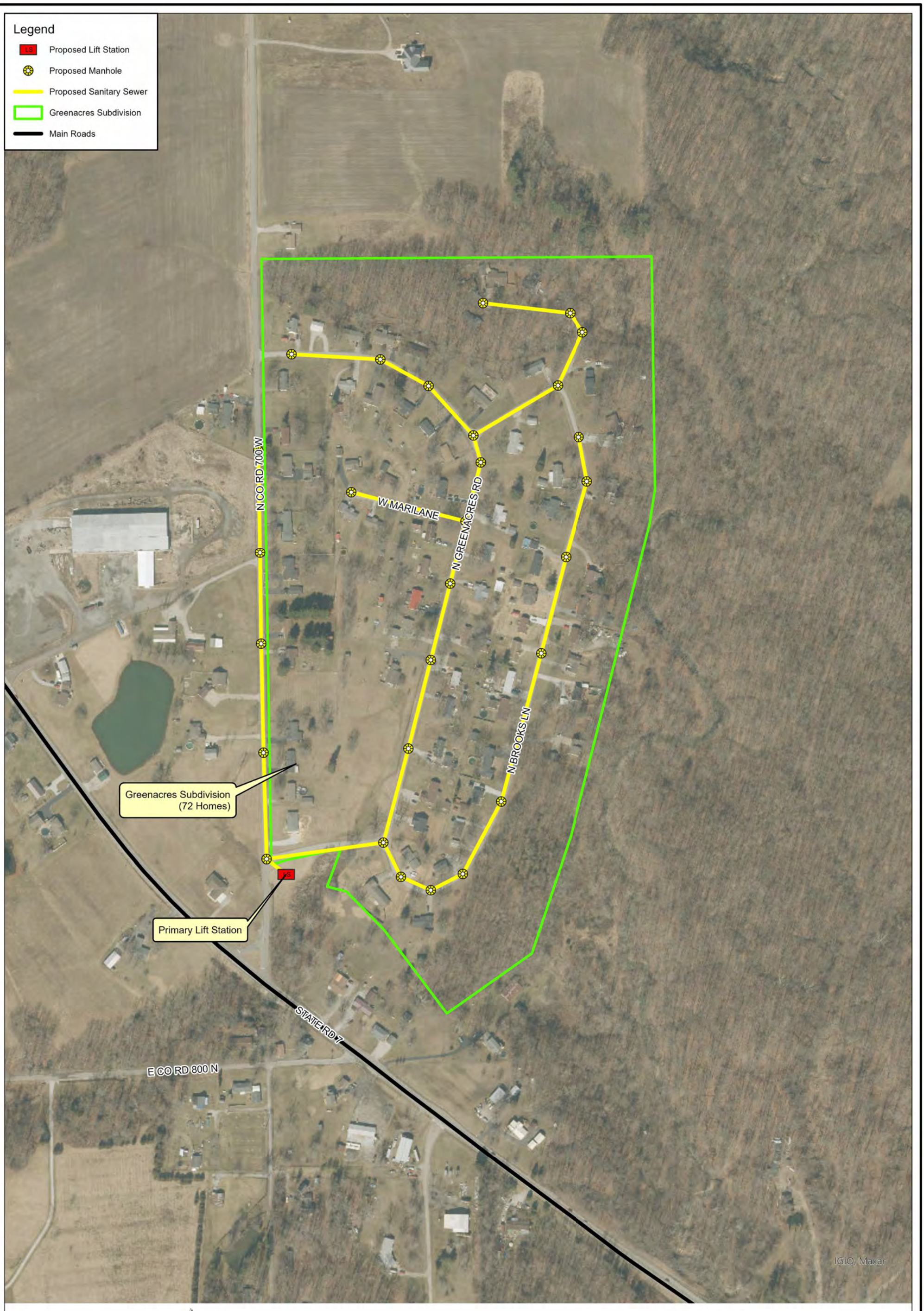
I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Sanitary Sewer 8" 0-10' dp.	3,400	LF	$100	$340,000
2	Sanitary Sewer 8" 10-20' dp.	500	LF	$150	$75,000
3	8" x 6" Wye Sanitary Lateral Connection	0	EA	$200	$0
4	6" Sanitary Sewer Lateral (20' each)	0	LF	$75	$0
5	Std. MH 0-10' dp.	11	EA	$7,500	$82,500
6	Std. MH 10-20' dp.	2	EA	$12,000	$24,000
7	Lift Station Complete	1	EA	$500,000	$500,000
8	LS Odor Control	1	EA	$50,000	$50,000
9	LS Force Main 6" (HDD Installation)	2,600	LF	$80	$208,000
10	LS Force Main 6" (Highway Crossing)	100	LF	$200	$20,000
11	Air Release Valves (6" FM)	3	EA	$15,000	$45,000
12	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
13	Utility Electrical Service to LS Allowance	1	EA	$75,000	$75,000
14	Granular Backfill	3,900	LF	$25	$97,500
15	Pavement Repair	3,800	LF	$60	$228,000
16	Drive Repair	100	LF	$100	$10,000
17	Rock Excavation (Undistributed)	40	CY	$175	$7,000
18	Erosion Control	1	LS	$25,000	$25,000
19	Maintenance of Traffic	1	LS	$10,000	$10,000
20	Additional Site Restorations	1	LS	$2,000	$2,000
21	Construction Engineering	1	LS	$15,000	$15,000
22	Mobilization and Demobilization (5%)	1	LS	$91,600	$91,600
Subtotal Construction Cost Estimate					**$1,923,600**
10% Contingency					$192,360
Total Construction Cost Estimate					**$2,115,960**
25% Non-Construction Costs					$528,990
Total Capital Cost (Rounded)					**$2,644,950**

Table 4.2.19B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
US 50 Bypass Service Area Alternative 1
Proposed Gravity Sewer, Lift Station and Force Main to North Vernon Collection System
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	New Proposed Lift Station (60 HP)	$30,000
	Total Additional Power Costs	$30,000
Labor Costs		
Item	Description	Amount
1	New Proposed Lift Station Labor: 4 hr/week @ $50/hr =	$10,400
	Total Additional Labor Costs	$10,400
Maintenance Costs		
Item	Description	Amount
1	Outside Service + Parts (Pump/Electrical Equipment)	$5,000
	Total Additional Maintenance Costs	$5,000
Material Costs – No Additional		
	Total Additional Annual O&M Costs	**$45,400**

Table 4.2.19C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
US 50 Bypass Service Area Alternative 1
Proposed Gravity Sewer, Lift Station and Force Main to North Vernon Collection System
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$2,644,950**
II. Annual O&M Costs					
	Total Annual O&M Costs				$45,400
	Uniform Series Present Worth of O&M Costs (-0.5%, 20-year term)				**$957,500**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Lift Station Pumps (60 HP)	20	2	$75,000	$150,000
	Single Payment Present Worth of Replacement Costs (-0.5%, Useful Life Term)				**$165,817**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Lift Station Pumps (60 HP)	20	2	$5,000	$10,000
	Single Payment Present Worth of Salvage Value (-0.5%, 20-year term)				**$11,054**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $2,644,950 + $957,500 + $165,817 - $11,054				
	Net Present Worth (rounded)				**$3,757,300**



N

Graphic Scale (Feet)

0 300 600

Scale: 1" =300'

Figure 4.1a

Jennings County Sanitary Master Plan

Greenacres Subdivision Alternative #1

Gravity Sewer

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

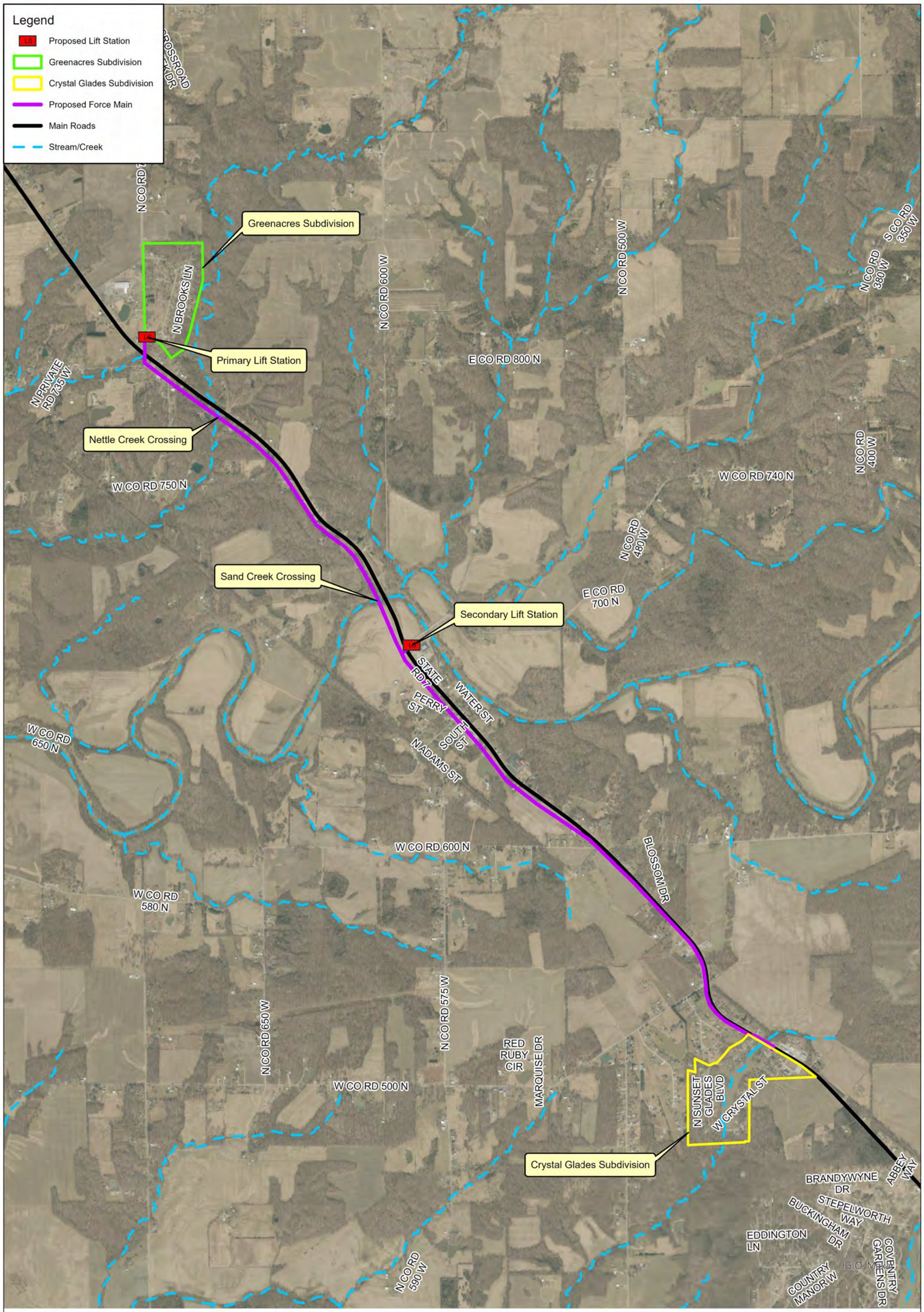


Figure 4.1b

Jennings County Sanitary Master Plan

Greenacres Subdivision Alternative #1 Force Main to Crystal Glades

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER 1_14_25.aprx

N

Graphic Scale (Feet)

0 300 600

Scale: 1" =300'

Figure 4.2a

Jennings County Sanitary Master Plan

Greenacres Subdivision Alternative #2

Gravity Sewer

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

Legend

- Scipio
- Proposed Manhole
- Proposed Sanitary Sewer
- Proposed Lift Station (LS)
- Proposed Force Main
- Main Roads
- Stream/Creek

Sand Creek Crossing

Secondary Lift Station

Downtown Scipio (54 Homes & 6 Commercial)

E CO RD 700 N

STATE RD 7

WATER ST

PERRY ST

MARKET ST

N WASHINGTON ST

N ADAMS ST

SOUTH ST

N CO RD 575 W

W CO RD 600 N

IGIO, Maxar, Microsoft

N

Graphic Scale (Feet)

0 500 1,000

Scale: 1" =500'

Figure 4.2b

Jennings County Sanitary Master Plan

Greenacres Subdivision Alternative #2 - Scipio Addition

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

Legend
- Greenacres Subdivision
- Crystal Glades Subdivision
- Scipio
- LS Proposed Lift Station
- Proposed Force Main
- Main Roads
- Stream/Creek

W CO RD 950 N
ROSSROAD CREEK DR
N CO RD 70
Greenacres Subdivision
N BROOKS LN
N CO RD 600 W
N CO RD 500 W
E CO RD 800 N
N CO RD 380 W
Primary Lift Station
Nettle Creek Crossing
W CO RD 750 N
N CO RD 400 W
W CO RD 740 N
Sand Creek Crossing
N CO RD 480 W
E CO RD 7
Secondary Lift Station
WATER ST
PERRY ST
N ADAMS ST
W CO RD 650 N
Scipio
STATE RD 7
BLOSSOM DR
W CO RD 600 N
W CO RD 580 N
Crystal Glades Subdivision
N CO RD 650 W
N CO RD 575 W
W CO RD 500 N
N SUNSET GLADES BLVD
W CRYSTAL ST
BRANDYWYNE DR
STEPELWORTH WAY
PRIMSHIRE LN
BUCKINGHAM DR
IGIO, Maxar

N

Graphic Scale (Feet)

0 2,000 4,000

Scale: 1" =2,000'

Figure 4.2c

Jennings County Sanitary Master Plan

Greenacres Subdivision Alternative #2 Force Main to Crystal Glades (Including Scipio Services)

Jennings County, Indiana

HWC ENGINEERING

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N

Graphic Scale (Feet)

0 300 600

Scale: 1" =300'

Figure 4.3a

Jennings County Sanitary Master Plan

Greenacres Subdivision Alternative #3

Low Pressure Sewer with Grinder Pumps

Jennings County, Indiana

HWC ENGINEERING

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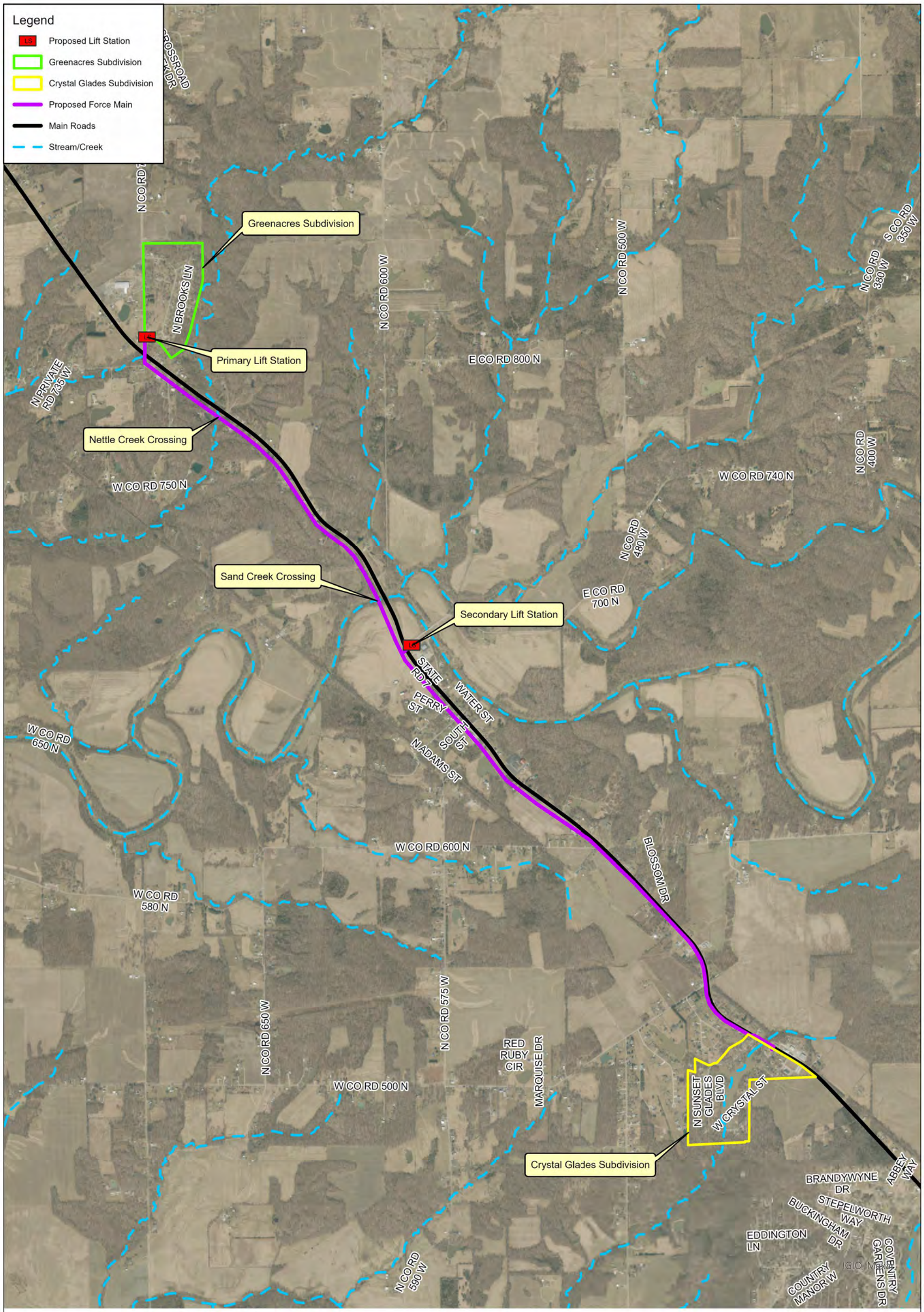

N

Graphic Scale (Feet)

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Scale: 1" =2,000'

Figure 4.3b

Jennings County Sanitary Master Plan

Greenacres Subdivision Alternative #3 Force Main to Crystal Glades

Jennings County, Indiana

HWC ENGINEERING

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Legend

- Proposed Lift Station (LS)
- Proposed Manhole
- Proposed Sanitary Sewer
- Proposed Force Main
- Crystal Glades Subdivision
- Main Roads

Primary Lift Station

Secondary Lift Station

Crystal Glades Subdivision
(71 Homes)

IGIO, Maxar

N

Graphic Scale (Feet)

0 400 800

Scale: 1" =400'

Figure 4.4a

Jennings County Sanitary Master Plan
Crystal Glades Subdivision Alternative #1
Gravity Sewer
Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

Legend

- Proposed Force Main
- Crystal Glades Subdivision
- Main Roads
- Stream/Creek

Crystal Glades Subdivision
(71 Homes)

JNRU LS#7
Collection System

N SUNSET GLADES BLVD
W CRYSTAL ST
W LAKE SHORE DR
STATE RD 7
N CO RD 345 W
W CO RD 500 N
S CO RD 350 W
N TAYLOR ST
E CO RD 450 N
S CO RD 300 W
N CO RD 295 W
STEPELWORTH WAY
COVYSHIRE CIR
SQUIRE LAKES DR
ABBEY WAY
ELLINGSWORTH WAY
PRIMSHIRE LN
EARLHAM WAY
BUCKINGHAM DR
EDDINGTON LN
SHAKERTOWN WAY
SHAKERTOWN CT
LORDSTON LN
DORYDOWN CT
WORTHINGTON WAY
MCINTOSH LN
STRATFORD WAY
BRIGHTON CT
ASCOT CT
CHANDLEAR LN
GILLYTON CT
AVONSHIRE CT
HUNTINGDON WAY
RUPELTON WAY
COVENTRY GARDENS DR
STONINGHAM WAY
W 415 N
BROADUS DR
BLYNSHIRE CIR
BLYN CT
BROWNINGTON CT
COUNTRY MANOR E
CLIFFSHIRE LN
WHITTINGTON DR
SHRIMPTON DR
LANGSTON WAY
PICCADILLY CT
ROTHSHIRE CIR
LOCUSTWOOD DR
COUNTRY MANOR W
SAXON CT
DORSTO CT
HONEY LOCUST CT
HONEY LOCUST PL
TUDOR PL
WALNUT GROVE
SPIREA CT
HICKORY WAY
MAPLE LN
ASPEN CT
BEECH RD
ELM CT
CRABAPPLE CT
GREENBRIAR CIR W
GREENBRIAR CIR
WILLOW WAY
ALMOND AVE
MEADOW GROVE CIR E
HEATHERLAN LN
RAEMONT WAY
FOXMOOR DR
HEATHGLEN CIR
HYLANDER DR
BRISTOL CT
GLEN CT
CEDAR KNOLL DR
EVERGREEN CIR WAY
DOGWOOD LN
CATALPA CT
MAGNOLIA PL
BENDING WILLOW LN
DOGWOOD CT
MOSS OAK CT
LARKSPUR LN
WILDWOOD RD
GINGER PL
ATKINSON CIR
JESHAM CT
PENNY LN
RENSLEER PL
TOWNSEND PL
BRETON CT
LAUGHTON CT
BALSAM DR
TULIP TREE TRL
SYCAMORE DR
CARDINAL DR
WHITE OAK WAY
COUNTRY SQUIRE BLVD
HOOSIER DR

IGIO, Maxar

N

Graphic Scale (Feet)

0 900 1,800

Scale: 1" =900'

Figure 4.4b

Jennings County Sanitary Master Plan

Crystal Glades Subdivision Alternative #1 Force Main to JNRU LS #7

Jennings County, Indiana

HWC ENGINEERING

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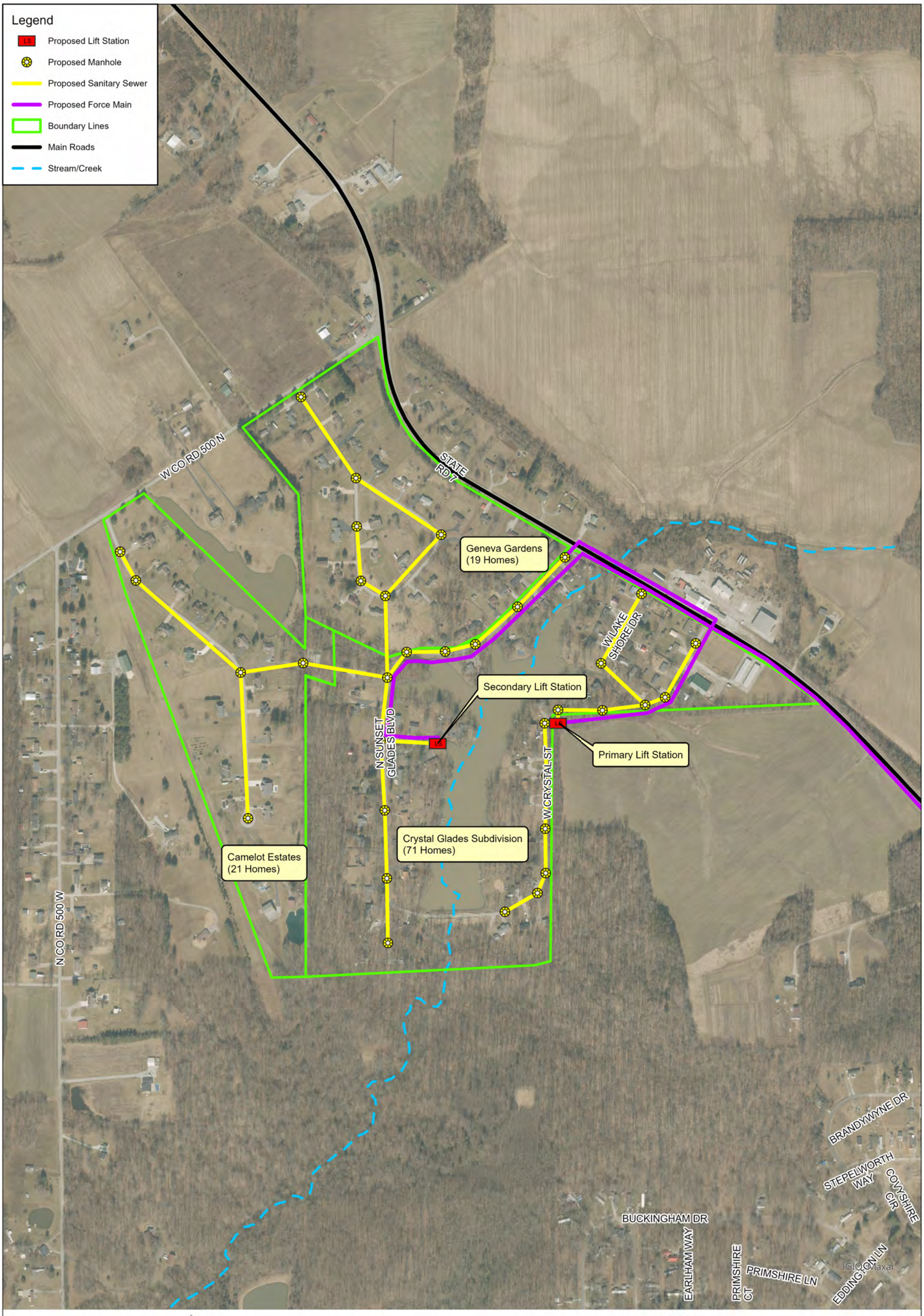

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Graphic Scale (Feet)

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Scale: 1" =500'

Figure 4.5a

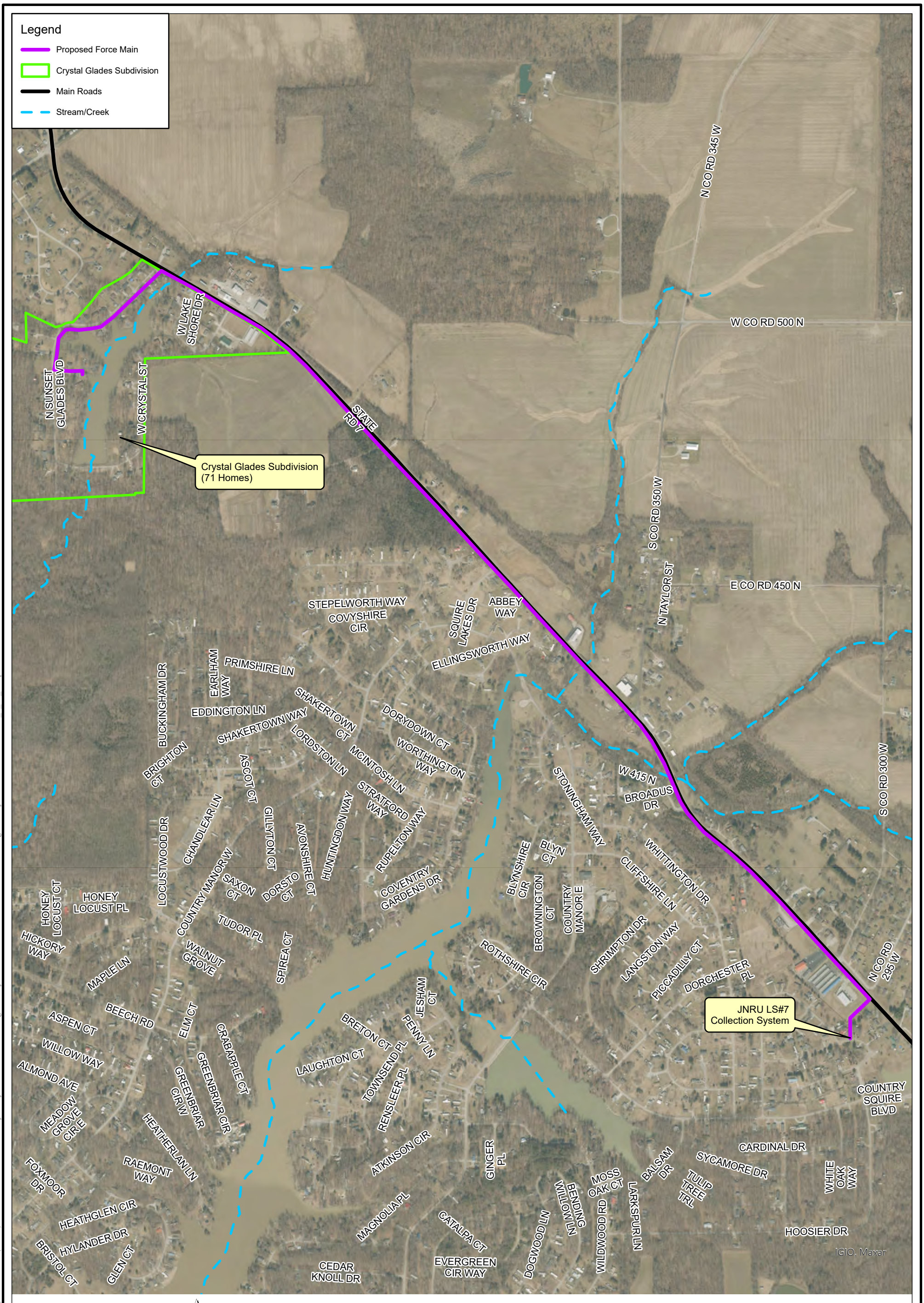
Jennings County Sanitary Master Plan

Crystal Glades Subdivision Alternative #2 - (Geneva Gardens and Camelot Estates)
Gravity Sewer Extended

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx



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Graphic Scale (Feet)

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Scale: 1" =900'

Figure 4.5b

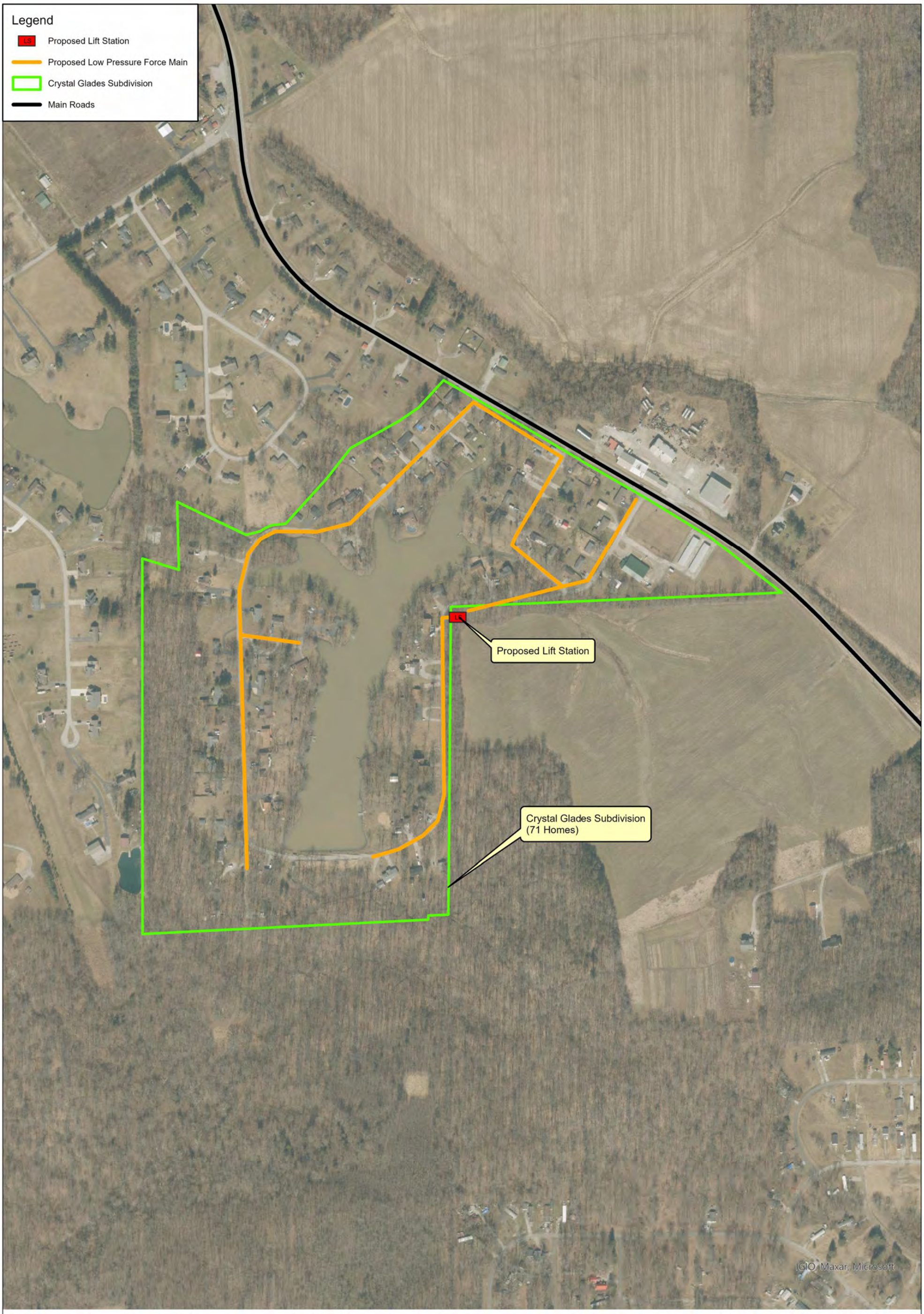
Jennings County Sanitary Master Plan

Crystal Glades Subdivision Alternative #2 Force Main to JNRU LS #7

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx



N

Graphic Scale (Feet)

0 400 800

Scale: 1" =400'

Figure 4.6a

Jennings County Sanitary Master Plan

Crystal Glades Subdivision Alternative #3
Low Pressure Sewer with Grinder Pumps

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

Legend

- LS — Proposed Lift Station
- Proposed Force Main
- Crystal Glades Subdivision
- Main Roads
- Stream/Creek

Crystal Glades Subdivision (71 Homes)

JNRU LS#7 Collection System

N SUNSET GLADES BLVD
W LAKE SHORE DR
W CRYSTAL ST
N CO RD 345 W
W CO RD 500 N
S CO RD 350 W
N TAYLOR ST
E CO RD 450 N
STATE RD 7
S CO RD 300 W
N CO RD 295 W
W 415 N
BROADUS DR
ABBEY WAY
STEPELWORTH WAY
COVYSHIRE CIR
ELLINGSWORTH WAY
PRIMSHIRE LN
EDDINGTON LN
EARLHAM WAY
BUCKINGHAM DR
SHAKERTOWN WAY
LORDSTON LN
MCINTOSH LN
WORTHINGTON WAY
COVENTRY GARDENS DR
STONINGHAM WAY
WHITTINGTON DR
CLIFFSHIRE LN
BLYN CT
BLYNSHIRE CIR
COUNTRY MANOR E
SHRIMPTON DR
LANGSTON WAY
PICCADILLY CT
ROTHSHIRE CIR
JESHAM CT
PENNY LN
BRETON CT
TOWNSEND PL
LAUGHTON CT
RENSLEER PL
ATKINSON CIR
CARDINAL DR
SYCAMORE DR
TULIP TREE TRL
WILDWOOD RD
LARKSPUR LN
DOGWOOD CT
DOGWOOD LN
BENDING WILLOW LN
EVERGREEN CIR WAY
MAGNOLIA PL
HOOSIER DR
CEDAR KNOLL DR
HONEY LOCUST PL
LOCUSTWOOD DR
CHANDLEAR LN
ASCOT CT
GILLYTON CT
AVONSHIRE CT
HUNTINGDON WAY
RUPELTON WAY
SAXON CT
TUDOR PL
SPIREA CT
HICKORY WAY
MAPLE LN
WALNUT GROVE
BEECH RD
ASPEN CT
ELM CT
CRABAPPLE CT
WILLOW WAY
ALMOND AVE
GREENBRIAR CIR
GREENBRIAR CIR W
MEADOW GROVE CIR E
COUNTRY MANOR W
HEATHERLAN LN
HEATHGLEN CIR
HYLANDER DR
BRISTOL CT
GLEN CT
IGIO, Maxar

N

Graphic Scale (Feet)

0 900 1,800

Scale: 1" =900'

Figure 4.6b

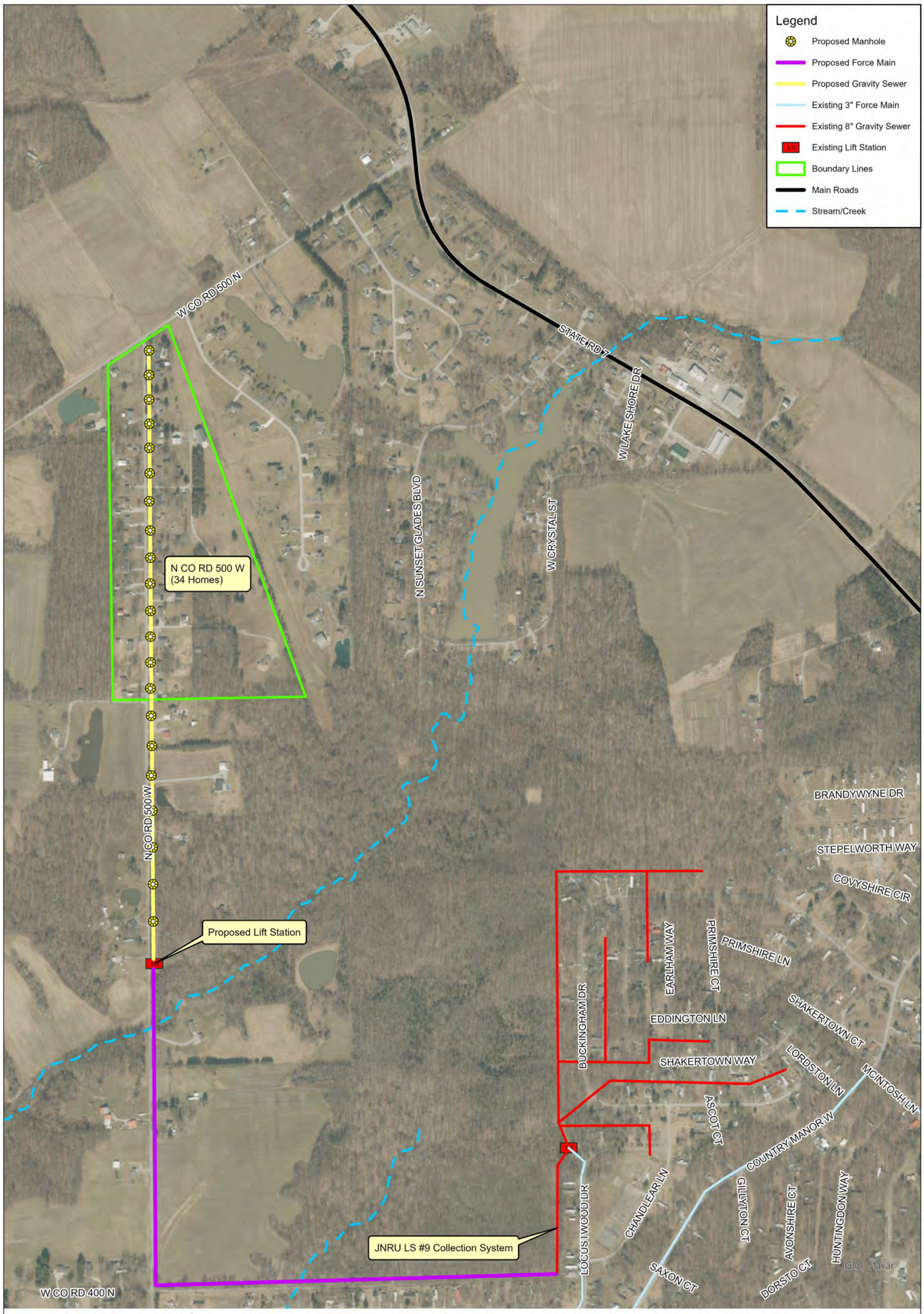
Jennings County Sanitary Master Plan

Crystal Glades Subdivision Alternative #3 Force Main to JNRU LS #7

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER 1 14 25.aprx



N

Graphic Scale (Feet)

0 600 1,200

Scale: 1" =600'

Figure 4.7

Jennings County Sanitary Master Plan

N Co Rd 500 W Alternative #1

Gravity Sewer

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU - WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

Legend

- Proposed Lift Station (LS)
- Proposed Manhole
- Proposed Sanitary Sewer
- Proposed Force Main
- Boundary Lines
- Existing 8" Gravity Sewer
- Main Roads
- Stream/Creek
- Floodway
- Flood Zone 'AE'
- Flood Zone 'A'

Sixmile Creek

Proposed Lift Station

S CO RD 300 W

N CO RD 295 W

STATE RD 7

Lawrence Subdivision
(29 Homes)

HAMPTON CT

DORVER LN

Country Squire Lakes Boundary

JNRU LS #7
Collection System

ASHLEY DR

IGIO, Maxar

N

Graphic Scale (Feet)

0 200 400

Scale: 1" =200'

Figure 4.8

Jennings County Sanitary Master Plan

Lawrence Subdivision Alternative #1

Gravity Sewer

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU - WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

Legend

- Proposed Low Pressure Force Main
- Boundary Lines
- Existing 8" Gravity Sewer
- Main Roads
- Stream/Creek
- Floodway
- Flood Zone 'AE'
- Flood Zone 'A'

Sixmile Creek

S CO RD 300 W

N CO RD 295 W

STATE RD 7

DORVER LN

MPTON CT

WENTWORTH PL

ASHLEY DR

Lawrence Subdivision
(29 Homes)

Country Squire Lakes Boundary

JNRU LS #7
Collection System

IGIO, Maxar, Microsoft

N

Graphic Scale (Feet)

0 200 400

Scale: 1" =200'

Figure 4.9

Jennings County Sanitary Master Plan
Lawrence Subdivision Alternative #2
Low Pressure Sewer
Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

Legend

- Existing Lift Station (LS)
- Existing 2" Force Main
- Existing 6" Force Main
- Existing 6" Vacuum Sewer
- Existing 8" Gravity Sewer
- Boundary Lines
- Main Roads
- Stream/Creek

DORVER LN
HAMPTON CT
WHITTINGTON DR
WENTWORTH PL
ASHLEY DR
COUNTRY SQUIRE BLVD
CARDINAL DR
SYCAMORE DR
WHITE OAK WAY
HOOSIER DR
TULIP TREE TRL
STATE RD 7
LS

Alternative 1 - Match Capacity
Replace Pumps and Level Switches, Replace and Relocate Control Panel, and Repair Wetwell Pipe Penetration

Alternative 2 - Increase Capacity
Replace Pumps and Level Switches, Replace and Relocate Control Panel, and Repair Wetwell Pipe Penetration

N

Graphic Scale (Feet)

0 200 400

Scale: 1" =200'

Figure 4.10

Jennings County Sanitary Master Plan

JNRU LS#7 Alternative #1 & #2

Jennings County, Indiana

HWC ENGINEERING

Legend

- Ex. Sanitary Manhole
- Ex. 8" Sanitary Sewer
- LS — Proposed Lift Station
- Proposed Manhole
- Proposed Sanitary Sewer
- Proposed Force Main
- Delmar Subdivision
- Main Roads

Discharge to North Vernon Collection System

SULLIVAN CT

DANIEL DR

BARLOW DR

US HWY 50

Delmar Subdivision (27 Homes)

W CO RD 15 N

N CO RD 210 W

N CO RD 205 W

Proposed Lift Station

LS

W CO RD 5 N

N BASE RD

IGIO, Maxar

N

Graphic Scale (Feet)

0 300 600

Scale: 1" =300'

Figure 4.11

Jennings County Sanitary Master Plan

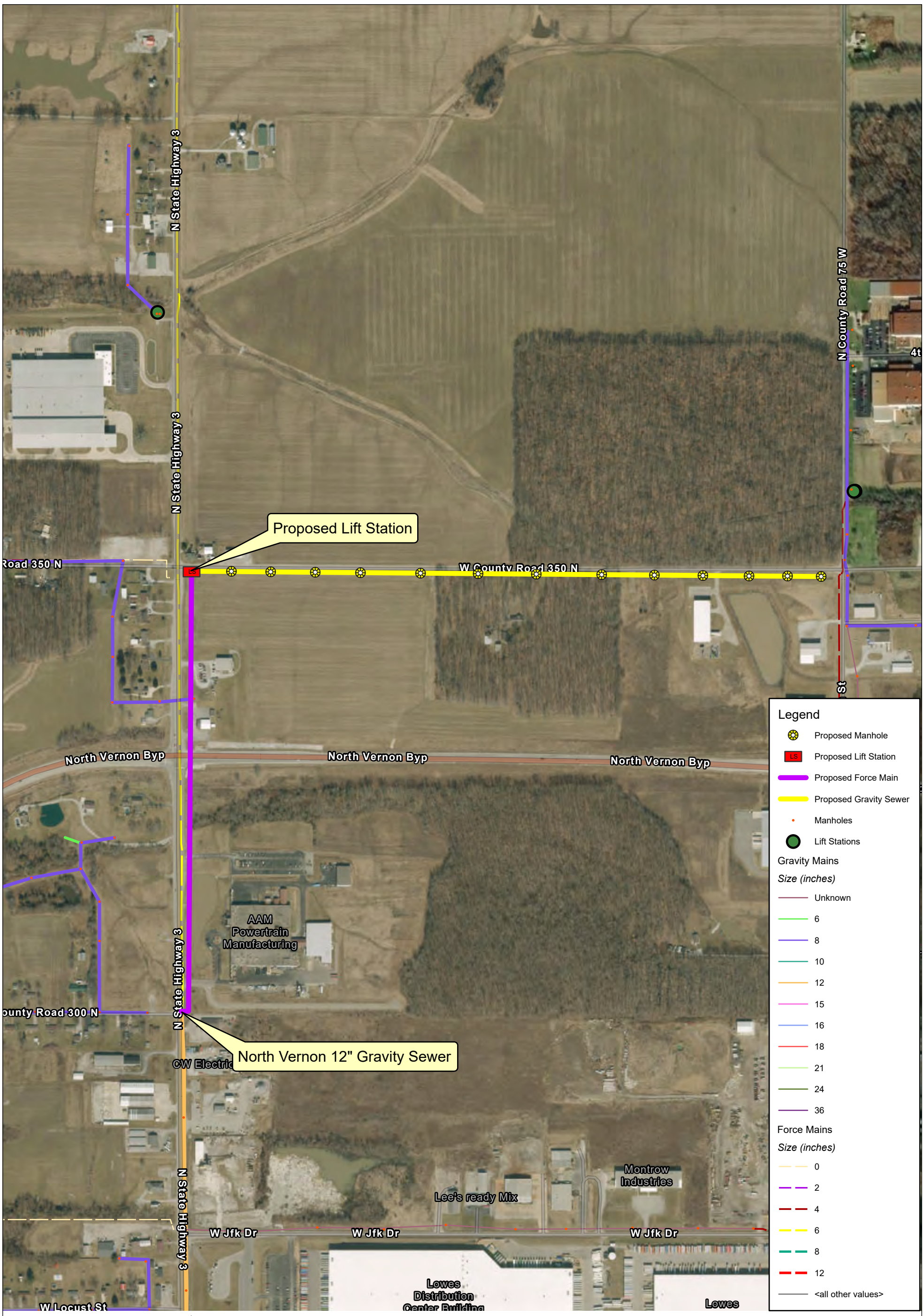
Delmar Subdivision Alternative #1

Gravity Sewer

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx



N

Graphic Scale (Feet)

0 700 1,400

Scale: 1" =700'

Figure 4.12

Jennings County Sanitary Master Plan

US 50 Bypass Service Area Alternative #1

Gravity Sewer

Jennings County, Indiana

HWC ENGINEERING

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4.3 Alternatives Considered – Wastewater Treatment

This section is provided to develop and evaluate alternatives to address the current needs of the existing wastewater treatment facility which serve the planning area as described in Section 2 with consideration for the future situation described in Section 3. Based on the condition and capacity of the North Vernon Wastewater Treatment facility, and the limited need for it to serve new connections evaluated in this PER, the treatment alternatives will be limited to the JNRU facility.

The wastewater treatment system needs for the JNRU plant will be addressed by holistic process options that will result in a fully compliant and sufficient treatment plant, and some options for unit processes in the holistic base system. The holistic base system is considered the primary biological treatment process, solids handling, and solids disposal. The wastewater treatment system alternatives considered for each process include the following:

Base Biological Treatment Alternatives

- Alternative 1 – Oxidation Ditch System
- Alternative 2 – Aero-Mod SEQUOX System
- Alternative 3 – Conversion of MSABP Basin to Extended Aeration System
- Alternative 4 – No Action

Ancillary Biosolids Alternatives

- Alternative 1 – Sludge Dewatering Filter Tower
- Alternative 2 – Sludge Dewatering Centrifuge
- Alternative 3 – Sludge Dewatering Screw Press

4.3.1 Base Alternative 1 – Oxidation Ditch System

In this alternative, the MSABP biological process will be replaced with an Oxidation Ditch Extended Aeration process to match the capacity of the existing plant at 0.35 MGD. The oxidation ditch system is a well-established process and would provide flexibility in operation for future expansion. The effluent from the oxidation ditch will flow to two new 35' secondary clarifiers, each designed to handle 100% capacity to allow for maintenance. Effluent from the secondary clarifiers will connect to the existing line discharging to the existing UV Disinfection System. Sludge from the secondary clarifiers will be pumped as Return Activated Sludge (RAS) to the head of the oxidation ditch or Waste Activated Sludge (WAS) to the repurposed MSABP basin for aerobic digestion and sludge storage. Solids disposal will be achieved by dumpster-based horizontal dewatering filter bags. Necessary ancillary equipment for this alternative include new controls and a control building for the new equipment.

This alternative will also eliminate the grit handling system by bypassing the Headcell grit separator completely as this process is not necessary with the new treatment process given the influent wastewater quality. This will also eliminate the Eutek Tea Cup system and allow both systems to be decommissioned. The NPDES permit would be revised to reflect this process change along with the new design.

Additionally, this alternative will include the removal of sludge from the bottom of the lagoons. This will provide for compliance with the current Agreed Order JNRU has with IDEM.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.3.1A** and **4.3.1B**. **Table 4.3.1C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $10,798,000, including contingency and the total project cost for this alternative, including non-construction costs is estimated to be $13,498,000.

4.3.2 Base Alternative 2 – Aero-Mod SEQUOX System

In this alternative, the MSABP biological process will be replaced with an Aero-Mod SEQUOX Biological Nutrient Removal process to match the capacity of the existing plant

at 0.35 MGD. This system incorporates aerobic biological treatment, clarification, and RAS/WAS pumping into a single compartmented concrete basin. Effluent from the Aero-Mod system will connect to the existing line discharging to the existing UV Disinfection System. Sludge from the Aero-Mod system will be pumped to the repurposed MSABP basin for aerobic digestion and sludge storage. Solids disposal will be achieved by dumpster-based horizontal dewatering filter bags. Necessary ancillary equipment for this alternative include new controls and a control building for the new equipment.

This alternative will also eliminate the grit handling system by bypassing the Headcell grit separator completely as this process is not necessary with the new treatment process given the influent wastewater quality. This will also eliminate the Eutek Tea Cup system and allow both systems to be decommissioned. The NPDES permit would be revised to reflect this process change along with the new design.

Additionally, this alternative will include the removal of sludge from the bottom of the lagoons. This will provide for compliance with the current Agreed Order JNRU has with IDEM.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in Table 4.3.2A and 4.3.2B. Table 4.3.2C shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $10,603,000, including contingency and the total project cost for this alternative, including non-construction costs is estimated to be $13,254,000.

4.3.3 Base Alternative 3 – Conversion of MSABP Basin to Extended Aeration System

In this alternative, the existing MSABP biological process and structure will be converted into an Extended Aeration process to match the capacity of the existing plant at 0.35 MGD. An additional treatment channel will be constructed adjacent to the MSABP basin while the MSABP remains in operation. The original chambers will be drained and converted to extended aeration sequentially. Similar to the Oxidation Ditch Alternative, the effluent from the extended aeration process will flow to two new 35' secondary clarifiers, each designed to handle 100% capacity to allow for maintenance. Effluent from the secondary clarifiers will connect to the existing line discharging to the existing UV Disinfection System. Sludge from the secondary clarifiers will be pumped as Return

Activated Sludge (RAS) to the head of the extended aeration process or Waste Activated Sludge (WAS) to a new aerobic digestion basin and sludge storage. Solids disposal will be achieved by dumpster-based horizontal dewatering filter bags. Necessary ancillary equipment for this alternative include new controls and a control building for the new equipment.

This alternative will also eliminate the grit handling system by bypassing the Headcell grit separator completely as this process is not necessary with the new treatment process given the influent wastewater quality. This will also eliminate the Eutek Tea Cup system and allow both systems to be decommissioned. The NPDES permit would be revised to reflect this process change along with the new design.

Additionally, this alternative will include the removal of sludge from the bottom of the lagoons. This will provide for compliance with the current Agreed Order JNRU has with IDEM.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in Table 4.3.3A and 4.3.3B. Table 4.3.3C shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $10,992,000, including contingency and the total project cost for this alternative, including non-construction costs is estimated to be $13,740,000.

4.3.4 Base Alternative 4 – No Action

The “no action” alternative would involve making no improvements to the existing wastewater treatment system. While “no action” would still allow the JNRU facility to accommodate additional flows for un-served areas evaluated, this alternative is not preferrable because it does not address the ineffective biological treatment process, lack of sludge removal, and deteriorating equipment nor does it address the Agreed Order between JNRU and IDEM.

Table 4.3.1A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Base Alternative 1
Proposed Oxidation Ditch, Clarifiers, and Sludge Processing
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Oxidation Ditch	1	LS	$2,069,000	$2,069,000
2	Controls & Equipment Building	1	LS	$320,000	$320,000
3	Flocculation and Flow Splitter Structure	1	LS	$84,000	$84,000
4	Secondary Clarifier	2	EA	$749,000	$1,498,000
5	RAS/WAS Pump Station	1	LS	$804,000	$804,000
6	Convert MSABP to Aerobic Digester & Sludge Storage	1	LS	$892,000	$892,000
7	Digester Submersible Pumps w/ VFDs	2	EA	$62,000	$124,000
8	Digester Pump Station	1	LS	$133,000	$133,000
9	Dewatering System	1	LS	$272,000	$272,000
10	Lagoon Sludge Removal	1	LS	$593,000	$593,000
11	Non-Potable Water System	1	LS	$138,000	$138,000
12	Headworks Bypass Channel	1	LS	$121,000	$121,000
13	Emergency Backup Generator	1	LS	$200,000	$200,000
14	Electrical and Controls	1	LS	$1,331,000	$1,331,000
15	Site Work	1	LS	$145,000	$145,000
16	Erosion Control	1	LS	$109,000	$109,000
17	Seeding & Restoration	1	LS	$91,000	$91,000
18	Construction Engineering	1	LS	$181,000	$181,000
19	Mobilization/Demobilization/Insurance/Bonds	1	LS	$723,000	$723,000
Subtotal Construction Cost Estimate					**$9,816,000**
10% Contingency					$982,000
Total Construction Cost Estimate					**$10,798,000**
25% Non-Construction Costs					$2,700,000
Total Capital Cost (Rounded)					**$13,498,000**

Table 4.3.1B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Base Alternative 1
Proposed Oxidation Ditch, Clarifiers, and Sludge Processing
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	Deduct MSABP Aeration (40 HP)	($25,000)
2	Oxidation Ditch Motors (20 HP)	$17,000
3	Digester Sludge Pumps (7.5 HP)	$700
4	Digester Blowers (30 HP)	$16,000
5	Clarifier Drives (0.5 HP)	$700
6	RAS/WAS Pumps (10 HP)	$10,000
7	Scum Pump (1.5 HP)	$100
8	Non-Potable Water Pumps (7.5 HP)	$800
9	Polymer System (3 HP)	$35
10	Electrical Systems (4kW)	$4,000
	Total Additional Power Costs	$24,335
Labor Costs		
Item	Description	Amount
1	Savings on Sludge Handling, Grit Cleaning (304 hrs/year at $55/hr)	($16,720)
2	Clarifier, Digester, Sludge Disposal Labor (4 hr/week at $55/hr)	$11,440
	Total Additional Labor Costs	($4,840)
Maintenance Costs		
Item	Description	Amount
1	Deduct MSABP Aeration (40 HP)	($300)
2	Oxidation Ditch Motors (20 HP)	$250
3	Digester Sludge Pumps (7.5 HP)	$250
4	Digester Blowers (30 HP)	$300
5	Clarifier Drives (0.5 HP)	$250
6	RAS/WAS Pumps (10 HP)	$250
7	Scum Pump (1.5 HP)	$250
8	Non-Potable Water Pumps (7.5 HP)	$250
9	Polymer System (3 HP)	$200
10	Electrical Systems	$250
	Total Additional Maintenance Costs	$1,950
Material Costs		
1	Dewatering Dumpster Replacement Bags (26 bags/year @$700/bag)	$18,200
2	Polymer (300 gallons/year @ $25/gallon)	$7,500
3	Landfill Disposal (26 loads/year @ $1,000/load)	$26,000
	Total Additional Material Costs	$51,700
	Total Additional Annual O&M Costs	**$73,145**

Table 4.3.1C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Base Alternative 1
Proposed Oxidation Ditch, Clarifiers, and Sludge Processing
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$13,498,000**
II. Annual O&M Costs					
	Total Annual O&M Costs				$73,145
	Uniform Series Present Worth of O&M Costs (2.2%, 20-year term)				**$1,864,000**
III. Replacement Costs					
Item	Description	Useful Life	Replacements Needed	Present Unit Cost	Future Total Replacement Cost
1	Oxidation Ditch Motors	15	4	$15,000	$83,766
2	Digester Sludge Pumps	15	2	$62,000	$173,117
3	Digester Aeration System	15	1	$175,825	$245,470
4	Digester Blower Motors	15	3	$15,000	$62,825
5	RAS/WAS Pumps	15	2	$51,000	$142,402
6	Scum Pump	15	1	$13,000	$18,149
7	NPW Booster Pumps	15	2	$14,000	$39,091
8	Dewatering Polymer System	15	1	$49,000	$68,409
	Single Payment Present Worth of Replacement Costs (2.2%, Useful Life Term)				**$833,000**
IV. Salvage Value					
Item	Description	Useful Life	Total Original Cost		Salvage Value
1	Digester Basin - existing concrete already 15 years old	35	$371,000		$102,900
2	Aeration Diffusers, Valves, Piping Modifications	25	$176,000		$22,800
3	Digester and Storage Tank Decanters	25	$182,000		$23,600
4	Digester Yard Piping	70	$164,000		$75,800
5	Digester Sludge Pumps (not including VFDs)	15	$64,000		$17,900
6	Digester Sludge Pump VFDs	30	$60,000		$12,900
7	Digester Pumps Electrical Pad & Enclosure	50	$133,000		$51,600
8	Oxidation Ditch Concrete Basin	50	$1,149,000		$446,100
9	Oxidation Ditch Aeration Motors	15	$60,000		$16,800
10	Oxidation Ditch Aeration Gearboxes	30	$310,000		$66,900
11	Oxidation Ditch Aeration Discs	15	$310,000		$86,500
12	SmartBNR Lite Controls	30	$111,000		$23,900
13	Oxidation Ditch Yard Piping	70	$129,000		$59,600
14	Oxidation Ditch Electrical Pad & Enclosure	50	$560,000		$217,400

15	Secondary Clarifiers - Equipment	25	$386,000	$50,000
16	Clarifier Launder Covers, Weirs and Scum Baffles	20	$112,000	$0
17	Clarifier Stairs	20	$10,000	$0
18	Secondary Clarifiers - Basin	50	$620,000	$240,700
19	Clarifier Pump Station Building	70	$649,000	$300,000
20	RAS/WAS Pumps - Second Replacement	15	$102,000	$28,500
21	Scum Pump - Second Replacement	15	$13,000	$3,600
22	Process Piping - Clarifiers	70	$88,000	$40,700
23	Flocculation and Flow Splitting Structure	50	$84,000	$32,600
24	Headworks Bypass Channel	50	$121,000	$47,000
25	NPW Booster Pumps	15	$28,000	$15,600
26	NPW Pressure Tank	30	$50,000	$10,800
27	NPW Process Piping, Fittings and Valves	70	$25,000	$11,600
28	Concrete Dewatering Pad, 30'x30', with trench drain (all inclusive)	50	$104,000	$40,400
29	Geotextile Dewatering System with Polymer Feed Building, Standpipe, Polymer Mixing System, and 2 Dumpsters (all inclusive)	50	$118,000	$45,800
30	Yard Piping and Valves	70	$50,000	$23,100
31	Cover Over Concrete Dewatering Pad (optional)	50	$90,000	$34,900
32	Additional Power Generator & ATS	30	$200,000	$43,100
33	Digester Electrical and Controls	30	$293,800	$63,400
34	Aeration Electrical and Controls	30	$413,800	$89,300
35	Clarifier Electrical and Controls	30	$477,000	$102,900
36	Headworks, NPW, Generator Electrical and Controls	30	$91,800	$19,800
37	Dewatering Electrical and Controls	30	$54,400	$11,700
	Single Payment Present Worth of Salvage Value (2.2%, 20-year term)			**$2,433,000**
V. Net Present Value				
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)			
	NPV = $13,498,000 + $1,852,000 + $833,000 - $2,433,000			
	Net Present Worth (rounded)			**$13,750,000**

Table 4.3.2A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Base Alternative 2
Proposed Aero-Mod and Sludge Processing
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Aero-Mod SEQUOX Equipment	1	LS	$1,514,000	$1,514,000
2	Aero-Mod SEQUOX Concrete Tank	1	LS	$2,012,000	$2,012,000
3	Aero-Mod Clarifier Roof	1	LS	$125,000	$125,000
4	Aero-Mod Controls & Equipment Building	1	LS	$616,000	$616,000
5	Convert MSABP to Aerobic Digester & Sludge Storage	1	LS	$892,000	$892,000
6	Digester Submersible Pumps w/ VFDs	2	EA	$62,000	$124,000
7	Digester Pump Station	1	LS	$133,000	$133,000
8	Dewatering System	1	LS	$272,000	$272,000
9	Lagoon Sludge Removal	1	LS	$593,000	$593,000
10	Non-Potable Water System	1	LS	$138,000	$138,000
11	Headworks Bypass Channel	1	LS	$121,000	$121,000
12	Emergency Backup Generator	1	LS	$200,000	$200,000
13	Electrical and Controls	1	LS	$1,713,000	$1,713,000
14	Site Work	1	LS	$131,000	$131,000
15	Erosion Control	1	LS	$82,000	$82,000
16	Seeding & Restoration	1	LS	$66,000	$66,000
17	Construction Engineering	1	LS	$176,000	$176,000
18	Mobilization/Demobilization/Insurance/Bonds	1	LS	$701,000	$701,000
Subtotal Construction Cost Estimate					**$9,639,000**
10% Contingency					$964,000
Total Construction Cost Estimate					**$10,603,000**
25% Non-Construction Costs					$2,651,000
Total Capital Cost (Rounded)					**$13,254,000**

Table 4.3.2B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Base Alternative 2
Proposed Aero-Mod and Sludge Processing
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	Deduct MSABP Aeration (40 HP)	($25,000)
2	Aero-Mod Blowers (44 HP) and Compressor (0.5 HP)	$29,300
3	Digester Sludge Pumps (7.5 HP)	$700
4	Digester Blowers (30 HP)	$16,000
5	WAS Pumps (2 HP)	$1,000
6	Non-Potable Water Pumps (7.5 HP)	$800
7	Polymer System (3 HP)	$35
8	Electrical Systems (4kW)	$4,000
	Total Additional Power Costs	$26,835
Labor Costs		
Item	Description	Amount
1	Savings on Sludge Handling, Grit Cleaning (304 hrs/year at $55/hr)	($16,720)
2	Digester, Sludge Disposal Labor (2 hr/week at $55/hr)	$11,440
3	Aeromod Low Intensity Operation Deduction (5 hr/month, $55/hr)	($3,300)
	Total Additional Labor Costs	($14,300)
Maintenance Costs		
Item	Description	Amount
1	Deduct MSABP Aeration (40 HP)	($300)
2	Aero-Mod Blowers (40 HP)	$300
3	Digester Sludge Pumps (7.5 HP)	$250
4	Digester Blowers (30 HP)	$300
5	WAS Pumps (10 HP)	$250
6	Scum Pump (1.5 HP)	$250
7	Non-Potable Water Pumps (7.5 HP)	$250
8	Polymer System (3 HP)	$200
9	Electrical Systems	$250
	Total Additional Maintenance Costs	$1,800
Material Costs		
1	Dewatering Dumpster Replacement Bags (26 bags/year @$700/bag)	$18,200
2	Polymer (300 gallons/year @ $25/gallon)	$7,500
3	Landfill Disposal (26 loads/year @ $1,000/load)	$26,000
	Total Additional Material Costs	$51,700
	Total Additional Annual O&M Costs	**$66,035**

Table 4.3.2C

Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Base Alternative 2
Proposed Aero-Mod and Sludge Processing
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$13,254,000**
II. Annual O&M Costs					
	Total Annual O&M Costs				$66,035
	Uniform Series Present Worth of O&M Costs (2.2%, 20-year term)				**$1,682,000**
III. Replacement Costs					
Item	Description	Useful Life	Replacements Needed	Present Unit Cost	Future Total Replacement Cost
1	Aeration Blower Motors	15	3	$15,000	$62,825
2	Aeration Diffusers	15	1	$210,300	$293,600
3	WAS Submersible Pump Motor	15	1	$7,000	$9,773
4	Digester Sludge Pumps (not including VFDs)	15	2	$32,000	$89,351
5	Digester Blower Motors	15	3	$15,000	$62,825
6	Digester aeration diffusers	15	1	$175,825	$245,469
7	NPW Booster Pumps	15	2	$14,000	$39,091
8	Dewatering Polymer System	15	1	$49,000	$68,409
	Single Payment Present Worth of Replacement Costs (2.2%, Useful Life Term)				**$871,000**
IV. Salvage Value					
Item	Description	Useful Life	Total Original Cost		Salvage Value
1	Aero-Mod Equipment	25	$1,514,000		$195,900
2	WAS Submersible Pump	15	$24,000		$6,700
3	Aero-Mod Yard Piping	70	$15,000		$6,900
4	Aero-Mod Concrete Basin	50	$2,012,000		$781,200
5	Aero-Mod Blower Building (Locate Aero-Mod Control Panels Inside Electrical/Controls Room with Roof over Exterior Blowers)	50	$560,000		$217,400
6	Aeration Piping	70	$30,000		$13,900
7	Digester Basin - existing concrete already 15 years old	35	$371,000		$102,900
8	Aeration Diffusers, Valves, Piping Modifications	25	$176,000		$22,800
9	Digester and Storage Tank Decanters	25	$182,000		$23,600
10	Digester Yard Piping	70	$164,000		$75,800
11	Digester Sludge Pumps (not including VFDs)	15	$64,000		$17,900
12	Digester Sludge Pump VFDs	30	$60,000		$12,900

13	Digester Pumps Electrical Pad & Enclosure	50	$133,000	$152,000
14	Headworks Bypass Channel	50	$121,000	$47,000
15	NPW Booster Pumps	15	$28,000	$7,800
16	NPW Pressure Tank	30	$50,000	$10,800
17	NPW Process Piping, Fittings and Valves	70	$60,000	$27,700
18	Concrete Dewatering Pad, 30'x30', with trench drain (all inclusive)	50	$104,000	$40,400
19	Geotextile Dewatering System with Polymer Feed Building, Standpipe, Polymer Mixing System, and 2 Dumpsters (all inclusive)	50	$118,000	$45,800
20	Yard Piping and Valves	70	$50,000	$23,100
23	Additional Power Generator & ATS	30	$200,000	$43,100
24	Digester Electrical and Controls	30	$353,000	$76,100
25	Aero-mod Electrical and Controls	30	$736,000	$158,800
26	Clarifier Electrical and Controls	30	$477,000	$102,900
27	Headworks, NPW, Generator Electrical and Controls	30	$92,000	$19,800
28	Dewatering Electrical and Controls	30	$54,000	$11,600
	Single Payment Present Worth of Salvage Value (2.2%, 20-year term)			**$2,306,000**
V. Net Present Value				
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)			
	NPV = $13,254,000 + $1,682,000 + $871,000 - $2,306,000			
	Net Present Worth (rounded)			**$13,501,000**

Table 4.3.3A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Base Alternative 3
Proposed Convert MSABP, Clarifiers, and Sludge Processing
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Convert MSABP to Extended Aeration	1	LS	$1,441,000	$1,441,000
2	Aeration Control & Equipment Building	1	LS	$560,000	$560,000
3	Flocculation and Flow Splitter Structure	1	LS	$84,000	$84,000
4	Secondary Clarifier	2	EA	$749,000	$1,498,000
5	RAS/WAS Pump Station	1	LS	$804,000	$804,000
6	New Digester and Sludge Holding Tanks	1	LS	$1,399,000	$1,399,000
7	Digester Submersible Pumps w/ VFDs	2	EA	$62,000	$124,000
8	Digester Blowers	3	EA	$47,000	$141,000
9	Dewatering System	1	LS	$272,000	$272,000
10	Lagoon Sludge Removal	1	LS	$593,000	$593,000
11	Non-Potable Water System	1	LS	$138,000	$138,000
12	Headworks Bypass Channel	1	LS	$121,000	$121,000
13	Emergency Backup Generator	1	LS	$200,000	$200,000
14	Electrical and Controls	1	LS	$1,357,000	$1,357,000
15	Site Work	1	LS	$148,000	$148,000
16	Erosion Control	1	LS	$111,000	$111,000
17	Seeding & Restoration	1	LS	$92,000	$92,000
18	Construction Engineering	1	LS	$182,000	$182,000
19	Mobilization/Demobilization/Insurance/Bonds	1	LS	$727,000	$727,000
Subtotal Construction Cost Estimate					**$9,992,000**
10% Contingency					$1,000,000
Total Construction Cost Estimate					**$10,992,000**
25% Non-Construction Costs					$2,748,000
Total Capital Cost (Rounded)					**$13,740,000**

Table 4.3.3B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Base Alternative 3
Proposed Convert MSABP, Clarifiers, and Sludge Processing
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	Deduct MSABP Aeration (40 HP)	($25,000)
2	Extended Aeration Blowers (45 HP)	$29,000
3	Digester Sludge Pumps (7.5 HP)	$700
4	Digester Blowers (30 HP)	$16,000
5	Clarifier Drives (0.5 HP)	$700
6	RAS/WAS Pumps (10 HP)	$10,000
7	Scum Pump (1.5 HP)	$100
8	Non-Potable Water Pumps (7.5 HP)	$1,000
9	Polymer System (3 HP)	$35
10	Electrical Systems (4kW)	$4,000
	Total Additional Power Costs	$36,535
Labor Costs		
Item	Description	Amount
1	Savings on Sludge Handling, Grit Cleaning (304 hrs/year at $55/hr)	($16,720)
2	Clarifier, Digester, Sludge Disposal Labor (4 hr/week at $55/hr)	$11,440
	Total Additional Labor Costs	($4,840)
Maintenance Costs		
Item	Description	Amount
1	Deduct MSABP Aeration (40 HP)	($300)
2	Extended Aeration Blowers (45 HP)	$300
3	Digester Sludge Pumps (7.5 HP)	$250
4	Digester Blowers (30 HP)	$300
5	Clarifier Drives (0.5 HP)	$250
6	RAS/WAS Pumps (10 HP)	$250
7	Scum Pump (1.5 HP)	$250
8	Non-Potable Water Pumps (7.5 HP)	$250
9	Polymer System (3 HP)	$200
10	Electrical Systems	$250
	Total Additional Maintenance Costs	$1,750
Material Costs		
1	Dewatering Dumpster Replacement Bags (26 bags/year @$700/bag)	$18,200
2	Polymer (300 gallons/year @ $25/gallon)	$7,500
3	Landfill Disposal (26 loads/year @ $1,000/load)	$26,000
	Total Additional Material Costs	$51,700
	Total Additional Annual O&M Costs	**$85,055**

Table 4.3.3C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Base Alternative 3
Proposed Convert MSABP, Clarifiers, and Sludge Processing
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$13,740,000**
II. Annual O&M Costs					
	Total Annual O&M Costs				$85,055
	Uniform Series Present Worth of O&M Costs (2.2%, 20-year term)				**$2,167,000**
III. Replacement Costs					
Item	Description	Useful Life	Replacements Needed	Present Unit Cost	Future Total Replacement Cost
1	Aeration Blower Motors	15	3	$15,000	$62,825
2	Aeration diffusers	15	1	$210,300	$293,600
3	Digester Sludge Pumps (not including VFDs)	15	2	$32,000	$89,351
4	Digester aeration diffusers	15	1	$175,825	$245,470
5	Digester Blower Motors	15	3	$15,000	$62,825
6	RAS/WAS Pumps	15	2	$1,000	$2,792
7	Scum Pumps	15	1	$13,000	$18,149
8	NPW Booster Pumps	15	2	$14,000	$39,091
9	Dewatering Polymer System	15	1	$49,000	$68,409
	Single Payment Present Worth of Replacement Costs (2.2%, Useful Life Term)				**$883,000**
IV. Salvage Value					
Item	Description	Useful Life	Total Original Cost		Salvage Value
1	Extended Aeration Basin - existing concrete already 15 years old	35	$1,131,000		$313,700
2	Aeration diffusers	25	$210,000		$27,200
3	Extended Aeration Basin Yard Piping	70	$99,000		$45,800
4	Digester and Storage Tanks	50	$528,000		$205,000
5	Digester and Storage Aeration Diffusers, Valves, Piping	25	$569,000		$73,600
6	Digester and Storage Tank Decanters	25	$182,000		$23,600
7	Digester Yard Piping	70	$60,000		$27,700
8	Digester Submersible Sludge Pumps (not including VFDs)	15	$64,000		$17,900
9	Digester Sludge Pump VFDs	30	$60,000		$12,900
10	Digester Blower Building	50	$560,000		$217,400
11	Digester Blowers (not including VFDs)	15	$51,000		$14,200
12	Digester Blower VFDs	30	$90,000		$19,400
13	Secondary Clarifiers - Equipment	25	$386,000		$50,000

14	Clarifier Launder Covers, Weirs and Scum Baffles	20	$112,000	$0
15	Clarifier Stairs	20	$10,000	$0
16	Secondary Clarifiers - Basin	50	$620,000	$240,700
17	Clarifier Pump Station Building	70	$649,000	$300,000
18	RAS/WAS Pumps - Second Replacement	15	$102,000	$28,500
19	Scum Pump - Second Replacement	15	$13,000	$3,600
20	Process Piping - Clarifiers	70	$88,000	$40,700
21	Flocculation and Flow Splitting Structure	50	$84,000	$32,600
22	Headworks Bypass Channel	50	$121,000	$47,000
23	NPW Booster Pumps	15	$28,000	$7,800
24	NPW Pressure Tank	30	$50,000	$10,800
25	NPW Process Piping, Fittings and Valves	70	$25,000	$11,600
26	Concrete Dewatering Pad, 30'x30', with trench drain (all inclusive)	50	$104,000	$40,400
27	Geotextile Dewatering System with Polymer Feed Building, Standpipe, Polymer Mixing System, and 2 Dumpsters (all inclusive)	50	$118,000	$45,800
28	Yard Piping and Valves	70	$50,000	$23,100
29	Additional Power Generator & ATS	30	$200,000	$43,100
30	Electrical and Controls	30	$445,000	$96,000
31	Digester Electrical and Controls	30	$288,000	$62,100
32	Aeration Electrical and Controls	30	$477,000	$102,900
33	Clarifier Electrical and Controls	30	$92,000	$19,800
34	Headworks, NPW, Generator Electrical and Controls	30	$54,000	$11,600
35	Dewatering Electrical and Controls	30	$148,000	$31,900
	Single Payment Present Worth of Salvage Value (2.2%, 20-year term)			**$2,355,000**
V. Net Present Value				
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)			
	NPV = $13,740,000 + $2,167,000 + $833,000 - $2,355,000			
	Net Present Worth (rounded)			**$14,385,000**

4.3.5 Ancillary Alternative 1 – Sludge Dewatering Filter Tower

This alternative will revise any of the base alternatives to replace the dumpster-based horizontal dewatering filter bag with a Vertical Tower Dewatering Filter Bag system. The filter tower uses a raised geotextile bag, the addition of a polymer, and the force of gravity for more efficient dewatering as compared to the dumpster-based horizontal dewatering filter bag. This system will be covered by a Pole Barn to keep the system dry and has reusable filter bags rather than single use bags of the dumpster-based system.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.3.5A** and **4.3.5B**. **Table 4.3.5C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $33,300, including contingency and the total project cost for this alternative, including non-construction costs is estimated to be $41,600.

4.3.6 Ancillary Alternative 2 – Sludge Dewatering Centrifuge

This alternative will revise any of the base alternatives to replace the dumpster-based horizontal dewatering filter bag with a centrifuge dewatering system. The centrifuge uses a high rpm motor to separate the water from the solids and will require the addition of a polymer. This system will be housed in a building with HVAC to protect the mechanical components and requires specialized maintenance and parts.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.3.6A** and **4.3.6B**. **Table 4.3.6C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $319,000, including contingency and the total project cost for this alternative, including non-construction costs is estimated to be $399,000.

4.3.7 Ancillary Alternative 3 – Sludge Dewatering Screw Press

This alternative will revise any of the base alternatives to replace the dumpster-based horizontal dewatering filter bag with a screw press dewatering system. The screw press uses a low rpm and high torque motor to compress the solids and may require the addition of a polymer. This system is recommended to be housed in a building to protect the mechanical components.

The preliminary estimate of capital costs and annual operation and maintenance costs are shown in **Table 4.3.7A** and **4.3.7B**. **Table 4.3.7C** shows the net present value for this alternative. As shown, the construction cost for this alternative is estimated to be $404,800, including contingency and the total project cost for this alternative, including non-construction costs is estimated to be $506,000.

Table 4.3.5A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Ancillary Alternative 1
Proposed Sludge Dewatering Filter Tower
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Deduct Dewatering Dumpster System	1	LS	($362,000)	($362,000)
2	Dewatering Bag Filter Tower	1	LS	$300,000	$300,000
3	Pole Barn	1	LS	$45,000	$45,000
4	HVAC for Pole Barn	1	LS	$50,000	$50,000
Subtotal Construction Cost Estimate					**$33,000**
10% Contingency					$300
Total Construction Cost Estimate					**$33,300**
25% Non-Construction Costs					$8,300
Total Capital Cost (Rounded)					**$41,600**

Table 4.3.5B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Ancillary Alternative 1
Proposed Sludge Dewatering Filter Tower
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	Pole Barn HVAC	$4,000
	Total Additional Power Costs	$4,000
Labor Costs		
Item	Description	Amount
1	None	$0
	Total Additional Labor Costs	$0
Maintenance Costs		
Item	Description	Amount
1	Pole Barn HVAC	$200
	Total Additional Maintenance Costs	$200
Material Costs		
1	None	
	Total Additional Material Costs	$0
	Total Additional Annual O&M Costs	**$4,200**

Table 4.3.5C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Ancillary Alternative 1
Proposed Sludge Dewatering Filter Tower
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$41,600**
II. Annual O&M Costs					
	Total Annual O&M Costs				$4,200
	Uniform Series Present Worth of O&M Costs (2.2%, 20-year term)				**$107,000**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Pole Barn HVAC	20	1	$50,000	$50,000
	Single Payment Present Worth of Replacement Costs (2.2%, Useful Life Term)				**$78,018**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Salvage Value
1	Dewatering Tower	30	1	$300,000	$64,700
2	Pole Barn	20	1	$45,000	$0
3	Pole Barn HVAC	20	1	$50,000	$0
	Single Payment Present Worth of Salvage Value (2.2%, 20-year term)				**$64,700**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $41,600 + $107,000 + $78,018 - $64,700				
	Net Present Worth (rounded)				**$161,918**

Table 4.3.6A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Ancillary Alternative 2
Proposed Sludge Dewatering Centrifuge
Estimated Capital Costs

I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Deduct Dewatering Dumpster System	1	LS	($362,000)	($362,000)
2	Dewatering Centrifuge	1	LS	$442,000	$442,000
3	Dewatering Building	1	LS	$85,000	$85,000
4	Metal Stairs and Platform for Centrifuge	1	LS	$75,000	$75,000
5	HVAC for Dewatering Building	1	LS	$50,000	$50,000
Subtotal Construction Cost Estimate					**$290,000**
10% Contingency					$29,000
Total Construction Cost Estimate					**$319,000**
25% Non-Construction Costs					$80,000
Total Capital Cost (Rounded)					**$399,000**

Table 4.3.6B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Ancillary Alternative 2
Proposed Sludge Dewatering Centrifuge
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	Centrifuge (20 HP)	$500
2	Dewatering Building HVAC	$4,000
	Total Additional Power Costs	$4,500
Labor Costs		
Item	Description	Amount
1	None	$0
	Total Additional Labor Costs	$0
Maintenance Costs		
Item	Description	Amount
1	Centrifuge	$500
2	Dewatering Building HVAC	$200
	Total Additional Maintenance Costs	$700
Material Costs		
1	None	
	Total Additional Material Costs	$0
	Total Additional Annual O&M Costs	**$5,200**

Table 4.3.6C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Ancillary Alternative 2
Proposed Sludge Dewatering Centrifuge
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$399,000**
II. Annual O&M Costs					
	Total Annual O&M Costs				$5,200
	Uniform Series Present Worth of O&M Costs (2.2%, 20-year term)				**$132,500**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Centrifuge	20	1	$442,000	$442,000
2	Dewatering Building HVAC	20	1	$50,000	$50,000
	Single Payment Present Worth of Replacement Costs (2.2%, Useful Life Term)				**$767,694**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Salvage Value
1	Centrifuge	15	1	$442,000	$123,400
2	Dewatering Building	50	1	$85,000	$33,000
3	Metal Stairs and Platform	50	1	$75,000	$29,100
4	Dewatering Building HVAC	20	1	$49,000	$0
	Single Payment Present Worth of Salvage Value (2.2%, 20-year term)				**$185,500**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $399,000 + $132,500 + $767,694 - $185,500				
	Net Present Worth (rounded)				**$1,113,694**

Table 4.3.7A
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Ancillary Alternative 3
Proposed Sludge Dewatering Screw Press
Estimated Capital Costs

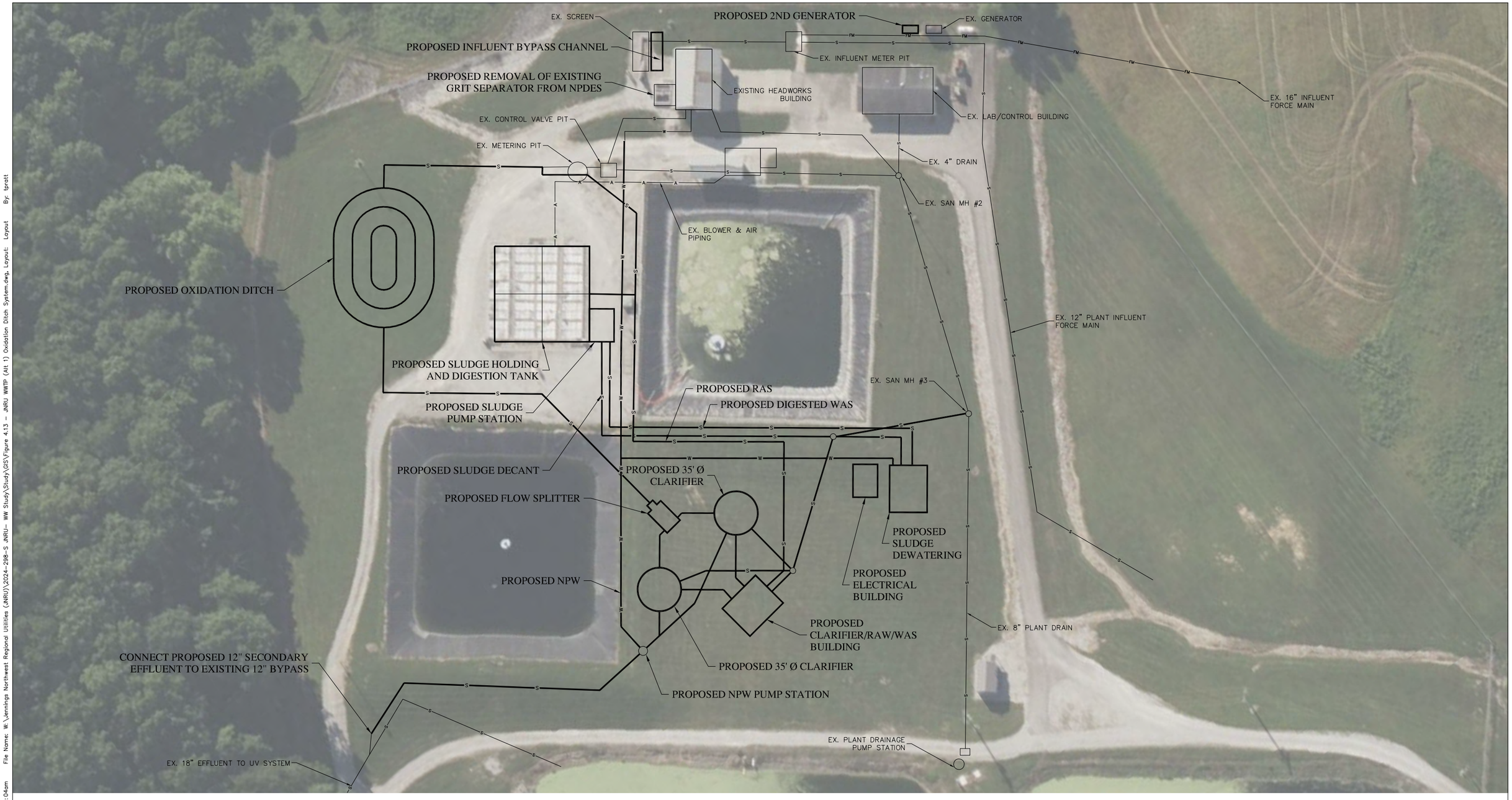
I. Capital Costs					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Deduct Dewatering Dumpster System	1	LS	($362,000)	($362,000)
2	Dewatering Screw Press	1	LS	$520,000	$520,000
3	Dewatering Building	1	LS	$85,000	$85,000
4	Metal Stairs and Platform for Screw Press	1	LS	$75,000	$75,000
5	HVAC for Dewatering Building	1	LS	$50,000	$50,000
Subtotal Construction Cost Estimate					**$368,000**
10% Contingency					$36,800
Total Construction Cost Estimate					**$404,800**
25% Non-Construction Costs					$101,200
Total Capital Cost (Rounded)					**$506,000**

Table 4.3.7B
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Ancillary Alternative 3
Proposed Sludge Dewatering Screw Press
Estimated Additional Operation & Maintenance Costs

II. Annual O&M Costs		
Power Costs		
Item	Description	Amount
1	Screw Press (2 HP)	$50
2	Dewatering Building HVAC	$4,000
	Total Additional Power Costs	$4,050
Labor Costs		
Item	Description	Amount
1	None	$0
	Total Additional Labor Costs	$0
Maintenance Costs		
Item	Description	Amount
1	Screw Press	$400
2	Dewatering Building HVAC	$200
	Total Additional Maintenance Costs	$600
Material Costs		
1	None	
	Total Additional Material Costs	$0
	Total Additional Annual O&M Costs	**$4,650**

Table 4.3.7C
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
JNRU WWTP Ancillary Alternative 3
Proposed Sludge Dewatering Screw Press
Estimated Net Present Worth

I. Capital Costs					
	Total Capital Cost				**$506,000**
II. Annual O&M Costs					
	Total Annual O&M Costs				$4,650
	Uniform Series Present Worth of O&M Costs (2.2%, 20-year term)				**$118,500**
III. Replacement Costs					
Item	Description	Useful Life	Quantity	Unit Cost	Amount
1	Screw Press	15	1	$520,000	$520,000
2	Dewatering Building HVAC	20	1	$50,000	$50,000
	Single Payment Present Worth of Replacement Costs (2.2%, Useful Life Term)				**$889,400**
IV. Salvage Value					
Item	Description	Useful Life	Quantity	Unit Cost	Salvage Value
1	Screw Press	15	1	$520,000	$145,200
2	Dewatering Building	50	1	$85,000	$33,000
3	Metal Stairs and Platform	50	1	$75,000	$29,100
4	Dewatering Building HVAC	20	1	$49,000	$0
	Single Payment Present Worth of Salvage Value (2.2%, 20-year term)				**$207,300**
V. Net Present Value					
	NPV = C+USPW(O&M) +SPPW(Replacement)-SPPW(Salvage)				
	NPV = $506,000 + $118,500 + $889,400 - $207,300				
	Net Present Worth (rounded)				**$1,306,600**



GRAPHIC SCALE

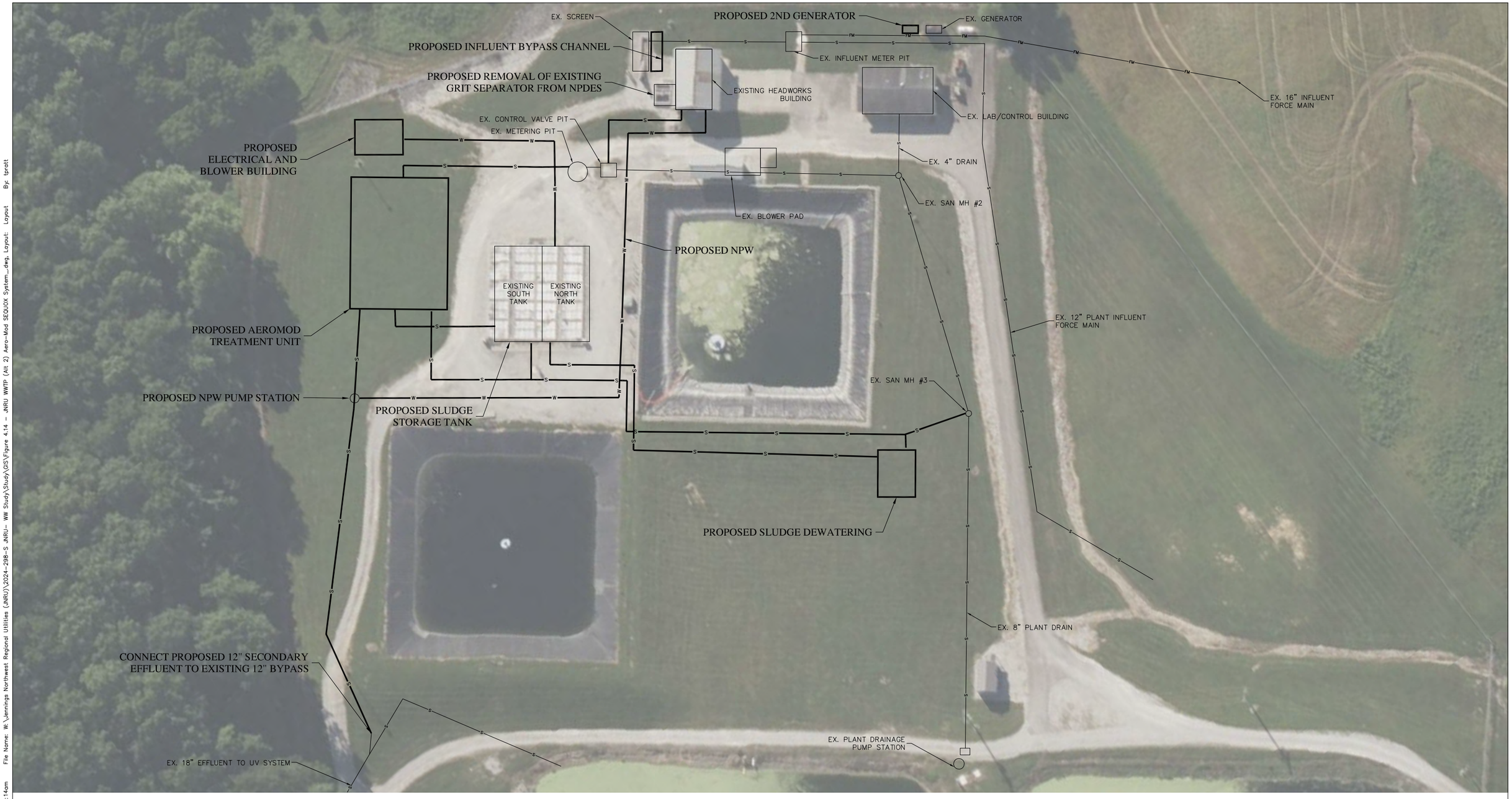
0' 60' 120'

(IN FEET)

FIGURE 4.13
JENNINGS COUNTY SANITARY MASTER PLAN
JNRU WWTP BASE ALTERNATIVE #1
OXIDATION DITCH SYSTEM
JENNINGS COUNTY, INDIANA
MARCH 2025

HWC ENGINEERING

Plot Date: Mar 24, 2025 Plot Time: 9:04am File Name: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\Figure 4.13 - JNRU WWTP (Alt 1) Oxidation Ditch System.dwg, Layout: Layout By: tpratt



GRAPHIC SCALE

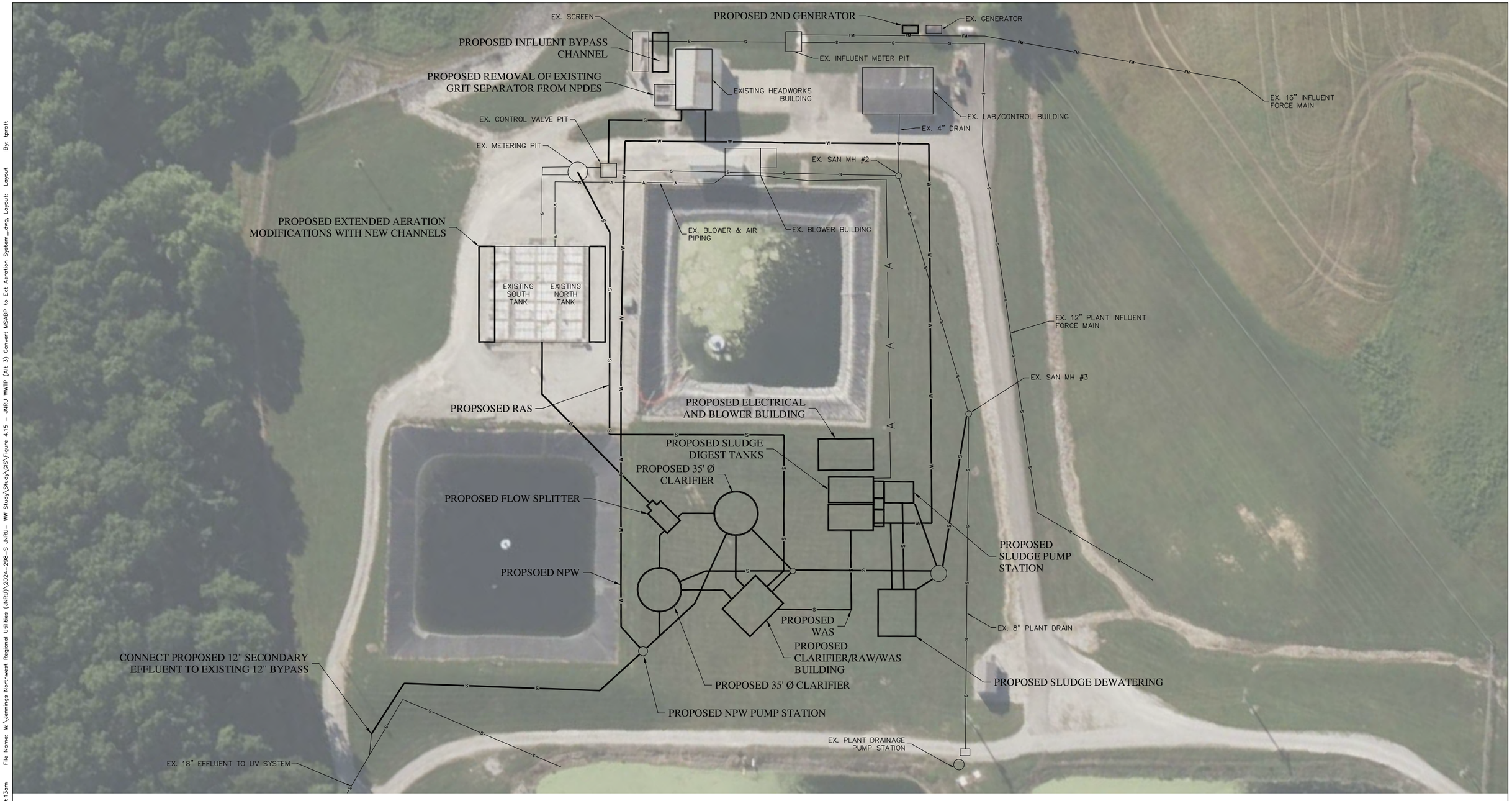
0' 60' 120'

(IN FEET)

FIGURE 4.14
JENNINGS COUNTY SANITARY MASTER PLAN
JNRU WWTP BASE ALTERNATIVE #2
AERO-MOD SEQUOX SYSTEM
JENNINGS COUNTY, INDIANA
MARCH 2025

HWC ENGINEERING

Plot Date: Mar 24, 2025 Plot Time: 9:14am File Name: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\Figure 4.14 - JNRU WWTP (Alt 2) Aero-Mod SEQUOX System_.dwg, Layout: Layout By: tpratt



GRAPHIC SCALE

0' 60' 120'

(IN FEET)

FIGURE 4.15
JENNINGS COUNTY SANITARY MASTER PLAN
JNRU WWTP BASE ALTERNATIVE #3
CONVERT MSABP TO EXT AERATION SYSTEM

JENNINGS COUNTY, INDIANA

MARCH 2025

HWC ENGINEERING

Plot Date: Mar 24, 2025 Plot Time: 9:13am File Name: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\Figure 4.15 - JNRU WWTP (Alt 3) Convert MSABP to Ext Aeration System_.dwg, Layout: Layout By: tpratt

Section Five – Evaluation of Environmental Impact

5.1 Introduction

This section of the report will discuss the impact on the environment caused by the construction of the feasible wastewater system improvement alternatives identified in Section Four.

Generally, environmental impacts can be classified as direct or indirect impacts. Direct impacts are caused by construction, operation or maintenance of the wastewater system improvements and include disruption 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; socioeconomic pressure from expansion or existing facilities.

The project alternatives for the wastewater system improvements are located within Jennings County, west and northwest of the city of North Vernon as shown in the Study Area Map, **Figure 1.2**. Additionally, **Figure 5.1** shows the project alternatives on a topographical map.

5.2 Evaluation of Environmental Impacts

5.2.1 Direct Impacts

5.2.1.1 Disturbed/Undisturbed Land

Figure 5.2a shows the location of each project alternative as well as the soil types for the project areas. **Figure 5.2b** provides the soil legend for all the soil types shown in **Figure 5.2a**. All proposed pipes and structures will be located on ground previously disturbed by construction.

5.2.1.2 Historic/Architectural Resources

There are historic sites around the project area. A map showing the locations of these historic sites relative to the project alternatives is shown in **Figure 5.3.** Some of the historic properties and structures are located near the proposed project areas but will be outside the project limits. None of the historic sites will be negatively impacted by any of the feasible alternatives.

There are three historical sites along State Road 7 between Greenacres and Scipio that would be in close proximity to the proposed force main from Greenacres. These include two farms and a historical home. There are a dozen historical sites within the downtown Scipio area that would need to be avoided with Greenacres Alternative #2. These include a bridge, churches, cemeteries, a farm, and historical homes. The historical sites on the east edge of the Bypass Service Area are a farm and a historical home and will be easily avoided.

5.2.1.3 Wetlands

National Wetlands Inventory (NWI) map shown in **Figure 5.4** shows some isolated wetlands throughout the project area. None of the project alternatives will directly impact wetlands. Mitigation requirements are discussed later in this section in order to project surrounding wetlands.

5.2.1.4 Surface Waters

None of the project alternatives will adversely affect any water bodies that are classified as Waters of High Quality; Exceptional Use Streams; Natural, Scenic and Recreational Rivers; Salmonoid Streams; or Outstanding Rivers. While Sand Creek and the Vernon Fork are listed on the Outstanding Rivers in Indiana list compiled by the Department of Natural Resources, these rivers are not expected to be negatively impacted as a result of construction of the proposed project alternatives.

5.2.1.5 Groundwater

The groundwater table may be minimally and temporarily impacted due to the construction of the project alternatives. However, groundwater quality will not be affected as a result of the construction.

5.2.1.6 100-Year Floodplain

The 100-year floodplain map for the project areas is shown in **Figure 5.5**. Although there are floodplains adjacent to some of the project areas, locations of pipes and structures will remain outside of the floodplain. The JNRU WWTP is located within the floodplain, where the 100-year flood elevation is approximately 624. All proposed alternatives to the JNRU WWTP will occur well above this elevation.

5.2.1.7 Plants and Animals

The construction and operation of the projects will not negatively impact state or federal-listed endangered or threatened species or their habitat. The projects will be implemented to minimize impact to non-endangered species and their habitat as well. See **Appendix E** for a list of threatened and endangered species list form the U.S. Department of Agriculture.

5.2.1.8 Prime Farmland Impacts and Influence with Local Geology

Soil maps from the U.S. Department of Agriculture Natural Resource Conservation Service (USDA NRCS) show that project alternatives for the wastewater system improvements will partially be constructed in soils classified as “prime farmland”. There are some agricultural lands along SR7 that may be impacted by construction of the force main from Greenacres and Crystal Glades subdivisions to JNRU’s collection system. However, these impacts would be temporary and limited to the easements adjacent to the SR-7. There will be no conversion of prime farmland as part of this project. See **Appendix F** for assessment of farmland conversion with the U.S. Department of Agriculture.

There are no karst geographic formations in the area of the project alternatives, and the bedrock will not be impacted by any of the feasible alternatives.

5.2.1.9 Air Quality

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

For all projects, short-term impacts on local air quality would include noise, fugitive dust and exhaust fumes resulting from construction activities to a minimal degree. These short-term impacts will be mitigated as described later in this section.

5.2.1.10 Open Space and Recreational Opportunities

The proposed project's construction and operation will neither create nor destroy open space or recreation opportunities.

5.2.1.11 Lake Michigan Coastal Management Zone Impacts

Since the project is not located in the Lake Michigan area, there are no adverse impacts on the coastal management zone.

5.2.1.12 National Natural Landmark Impacts

The construction and operation of the proposed projects will not affect national natural landmarks.

5.2.2 Indirect Impacts

Jennings County, through its Board of Directors, County Commissioners or other means, will ensure that future development, as well as future wastewater system improvement projects connecting to the SRF-funded facilities will not adversely affect wetlands, wooded areas, steep slopes, archaeological/historical/structural resources, or other sensitive environmental resources. Jennings County and/or a sewer district will require new development projects to be constructed within the guidelines of the U.S. Fish and Wildlife Service, IDNR, IDEM and other environmental review authorities.

5.2.3 Mitigation Measures

This section presents a list of mitigation measures that will be utilized for minimizing or avoiding impacts from the proposed projects.

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 cause impacts. The following is a listing of possible mitigation measures.

5.2.3.1 General Erosion and Sedimentation Control Measures

- Removal of existing vegetation will be kept to a minimum. Whenever feasible and, when appropriate, land grading and excavating will be kept to a minimum in order to reduce the possibilities of creating excessive runoff and erosion problems.
- Appropriate structural (e.g., sediment basins, riprap) or agronomic (e.g., seeding, mulching, liming, fertilizing) practices to control erosion and sedimentation will be in place during and after construction.
- Drainage systems will be stabilized as early as possible to avoid sedimentation problems.
- 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 construction entrances 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.
- An erosion and sedimentation control plan will be developed and implemented in coordination with the Indiana Department of Environmental Management and U.S. Natural Resource Conservation Service.
- Areas of exposed soil will be periodically wetted.
- 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 construction area so that any erosion will be into the trench rather than being washed in drainage ways.
- 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.

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

5.2.3.2 Flood Plain-Related Measures

No construction is proposed within 100-year floodplain; therefore, no long-term impacts are anticipated to occur as a result of the improvements. Any mitigation measures cited by the Environmental Agencies will be followed to ensure short-term impacts are minimal, and the area will be returned to its prior use after construction.

5.2.3.3 Cultural Resource-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.

5.2.3.4 Air Quality-Related Measures

Exposed soils and unpaved roadways 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 emissions.

5.2.3.5 Noise-Related Measures

Construction equipment will be well muffled and enclosed where possible. Construction will be scheduled for daylight hours only. The number and size of equipment and vehicles will be minimized.

Legend

study_area

Name

Study Area; bypass service area; N CR 500; Country Squire Lakes Subdivision

LS Existing Lift Station

WWTP Existing Wastewater Treatment Plant

Main Roads

Greenacres Subdivision

Downtown Scipio

Crystal Glades Subdivision

North County Road 500 West

Lawrence Subdivision

Bypass Service Area

JNRU Wastewater Treatment Plant

JNRU Lift Station #7

North Vernon Wastewater Treatment Plant

Delmar Subdivision

N

Graphic Scale (Feet)

0 4,000 8,000

Scale: 1" =4,000'

Figure 5.1

Jennings County Sanitary Master Plan

USGS Topographical Map

Jennings County, Indiana

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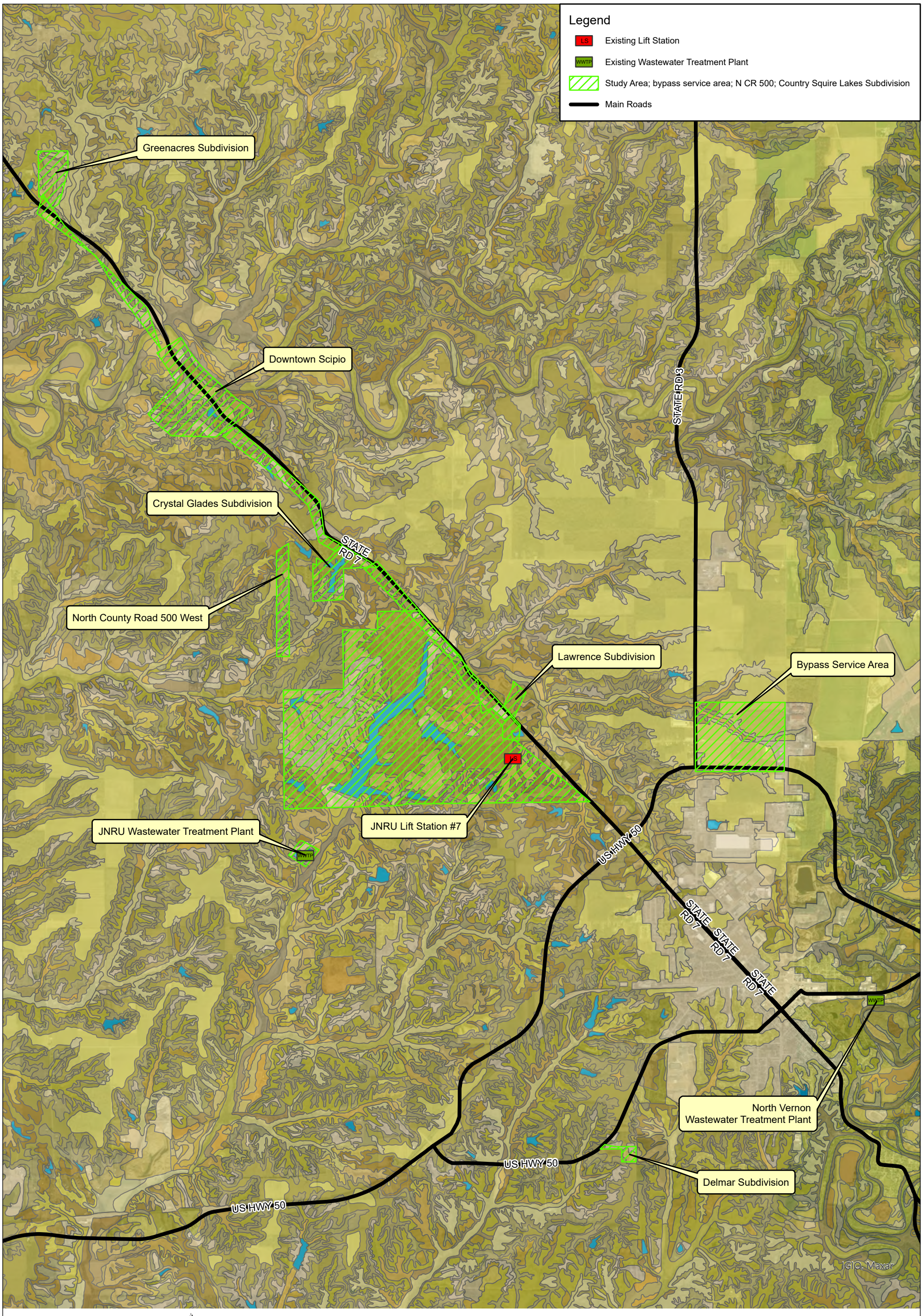

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Figure 5.2a

Jennings County Sanitary Master Plan

Soils Map

Jennings County, Indiana

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Map Unit Symbol	Map Unit Name	Hydrologic Soil Group
AddA	Avonburg silt loam, 0 to 2 percent slopes	C/D
AddB2	Avonburg silt loam, 2 to 4 percent slopes, eroded	C/D
BbhA	Bartle silt loam, 0 to 2 percent slopes	C/D
BgeAH	Birds silt loam, 0 to 1 percent slopes, frequently flooded, brief duration	B/D
BgeAHU	Birds silt loam, undrained, 0 to 1 percent slopes, frequently flooded, brief duration	C/D
BlbB2	Blocher, soft black shale substratum-Jennings silt loams, 2 to 6 percent slopes, eroded	C
BlcC2	Blocher, soft black shale substratum-Jennings-Deputy silt loams, 6 to 12 percent slopes, eroded	C
BlcC3	Blocher, soft black shale substratum-Jennings-Deputy silt loams, 6 to 12 percent slopes, severely eroded	D
BlgC2	Blocher-Cincinnati silt loams, 6 to 12 percent slopes, eroded	C
BlgC3	Blocher-Cincinnati silt loams, 6 to 12 percent slopes, severely eroded	D
BlkE2	Bonnell-Blocher-Hickory silt loams, 12 to 25 percent slopes, eroded	C
BnuD3	Bonnell-Hickory-Blocher complex, 12 to 25 percent slopes, severely eroded	C
BnxE2	Bonnell-Grayford silt loams, karst, hilly, eroded	C
BnxE3	Bonnell-Grayford silt loams, karst, hilly, severely eroded	C
BobE4	Bonnell-Hickory clay loams, 15 to 30 percent slopes, very severely eroded	C
BodAQ	Bonnie silt loam, 0 to 1 percent slopes, rarely flooded	C/D
CcaG	Caneyville-Rock outcrop complex, 25 to 60 percent slopes	C
CcbC2	Caneyville-Zenas silt loams, karst, rolling, eroded	C
CcgD2	Caneyville and Grayford silt loams, 12 to 25 percent slopes, eroded	B
CcgD3	Caneyville and Grayford silt loams, 12 to 25 percent slopes, severely eroded	B
CldB2	Cincinnati-Blocher silt loams, 2 to 6 percent slopes, eroded	C
ClfA	Cobbsfork silt loam, 0 to 1 percent slopes	C/D
CwaAQ	Cuba silt loam, 0 to 2 percent slopes, rarely flooded	B
CxdA	Cyclone silty clay loam, 0 to 1 percent slopes	B/D
DfnA	Dubois silt loam, 0 to 2 percent slopes	C/D
DfnB2	Dubois silt loam, 2 to 6 percent slopes, eroded	C/D
DtwC2	Deputy silt loam, 6 to 15 percent slopes, eroded	C/D
DtzC3	Deputy-Trappist silty clay loams, 6 to 15 percent slopes, severely eroded	C/D
EesB2	Elkinsville-Millstone complex, 2 to 6 percent slopes, eroded	B
FdbA	Fincastle silt loam, New Castle Till Plain, 0 to 2 percent slopes	B/D
FdqB	Fincastle-Xenia silt loams, 2 to 4 percent slopes	B/D
GmsF	Greybrook silt loam, 15 to 40 percent slopes	C
HccB2	Haubstadt silt loam, 2 to 6 percent slopes, eroded	C/D
HcgAW	Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration	B
HcpAP	Haymond silt loam, depression, 0 to 2 percent slopes, frequently ponded, very brief duration	B
HeeG	Hickory loam, 25 to 50 percent slopes	B
HizE2	Hickory-Grayford silt loams, 12 to 25 percent slopes, eroded	B
HizE3	Hickory-Grayford silt loams, 12 to 25 percent slopes, severely eroded	B
HleAW	Holton silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration	B/D
MhyB2	Medora silt loam, 2 to 6 percent slopes, eroded	D
MhyC3	Medora silt loam, 6 to 12 percent slopes, severely eroded	D
MmoC3	Miami clay loam, 6 to 12 percent slopes, severely eroded	C
MmoD3	Miami clay loam, 12 to 18 percent slopes, severely eroded	C
MnpC2	Miami silt loam, 6 to 12 percent slopes, eroded	C
MnpD2	Miami silt loam, 12 to 18 percent slopes, eroded	C
NaaA	Nabb silt loam, 0 to 2 percent slopes	C/D
NaaB2	Nabb silt loam, 2 to 6 percent slopes, eroded	C/D
OfaAW	Oldenburg silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration	B/D
OmkC2	Otwell silt loam, 6 to 12 percent slopes, eroded	C
OmkC3	Otwell silt loam, 6 to 12 percent slopes, severely eroded	D
Omz	Orthents, earthen dam	
PcrA	Pekin silt loam, 0 to 2 percent slopes	C/D
PcrB2	Pekin silt loam, 2 to 6 percent slopes, eroded	C/D
PcrC2	Pekin silt loam, 6 to 12 percent slopes, eroded	C/D
PhaA	Peoga silt loam, 0 to 1 percent slopes	C/D
PlpAH	Piopolis silty clay loam, 0 to 1 percent slopes, frequently flooded, brief duration	C/D
Pml	Pits, quarry	
RptG	Rohan-Jessietown complex,25 to 60 percent slopes, rocky	D
RywB2	Russell silt loam, 2 to 6 percent slopes, eroded	B
RzfA	Ryker-Muscatatuck silt loams, terrace, 0 to 2 percent slopes	B
RzfB2	Ryker-Muscatatuck silt loams, terrace, 2 to 6 percent slopes, eroded	B
RzgA	Ryker-Muscatatuck silt loams, karst, nearly level	B
RzgB2	Ryker-Muscatatuck silt loams, karst, undulating, eroded	B
RzgC2	Ryker-Muscatatuck silt loams, karst, rolling, eroded	B
RzhC3	Ryker-Grayford-Muscatatuck complex, karst, rolling, severely eroded	B
SceA	Scottsburg silt loam, 0 to 2 percent slopes	C/D
ScfB2	Scottsburg-Deputy silt loams, 2 to 6 percent slopes, eroded	C/D
SldAW	Shoals silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration	B/D
StaAH	Steff silt loam, 0 to 2 percent slopes, frequently flooded, brief duration	B/D
StaAQ	Steff silt loam, 0 to 2 percent slopes, rarely flooded	B/D
StdAQ	Stendal silt loam, 0 to 2 percent slopes, rarely flooded	B/D
SuoAH	Stonelick fine sandy loam, 0 to 2 percent slopes, frequently flooded	A
ThbD4	Trappist silty clay loam, 6 to 18 percent slopes, very severely eroded	C
ThcD3	Trappist-Rohan complex, 12 to 25 percent slopes, severely eroded	C
ThdD2	Trappist-Rohan silt loams, 12 to 25 percent slopes, eroded	C
Uby	Udorthents, loamy	
UdaB	Urban land-Deputy-Scottsburg complex, 2 to 15 percent slopes	
UfcB	Urban land-Cincinnati-Nabb complex, 2 to 12 percent slopes	
UfdA	Urban land-Cobbsfork-Avonburg complex, 0 to 2 percent slopes	
Usl	Udorthents, rubbish	
W	Water	
WaaAH	Wakeland silt loam, 0 to 2 percent slopes, frequently flooded, brief duration	B/D
WaaAW	Wakeland silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration	B/D
WnmA	Whitcomb silt loam, 0 to 2 percent slopes	C/D
WokAH	Wilbur silt loam, 0 to 2 percent slopes, frequently flooded, brief duration	B/D
WokAW	Wilbur silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration	B/D
WooAQ	Wilhite silt loam, overwash, 0 to 1 percent slopes, rarely flooded	C/D
WprAV	Wirt loam, 0 to 2 percent slopes, frequently flooded, very brief duration	B
WprAW	Wirt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration	B
XabB2	Xenia silt loam, 2 to 6 percent slopes, eroded	B/D
ZnsB	Zenas silt loam, karst, undulating	B

Figure 5.2b

Jennings County Sanitary Master Plan

Soils Map Legend

Jennings County, Indiana

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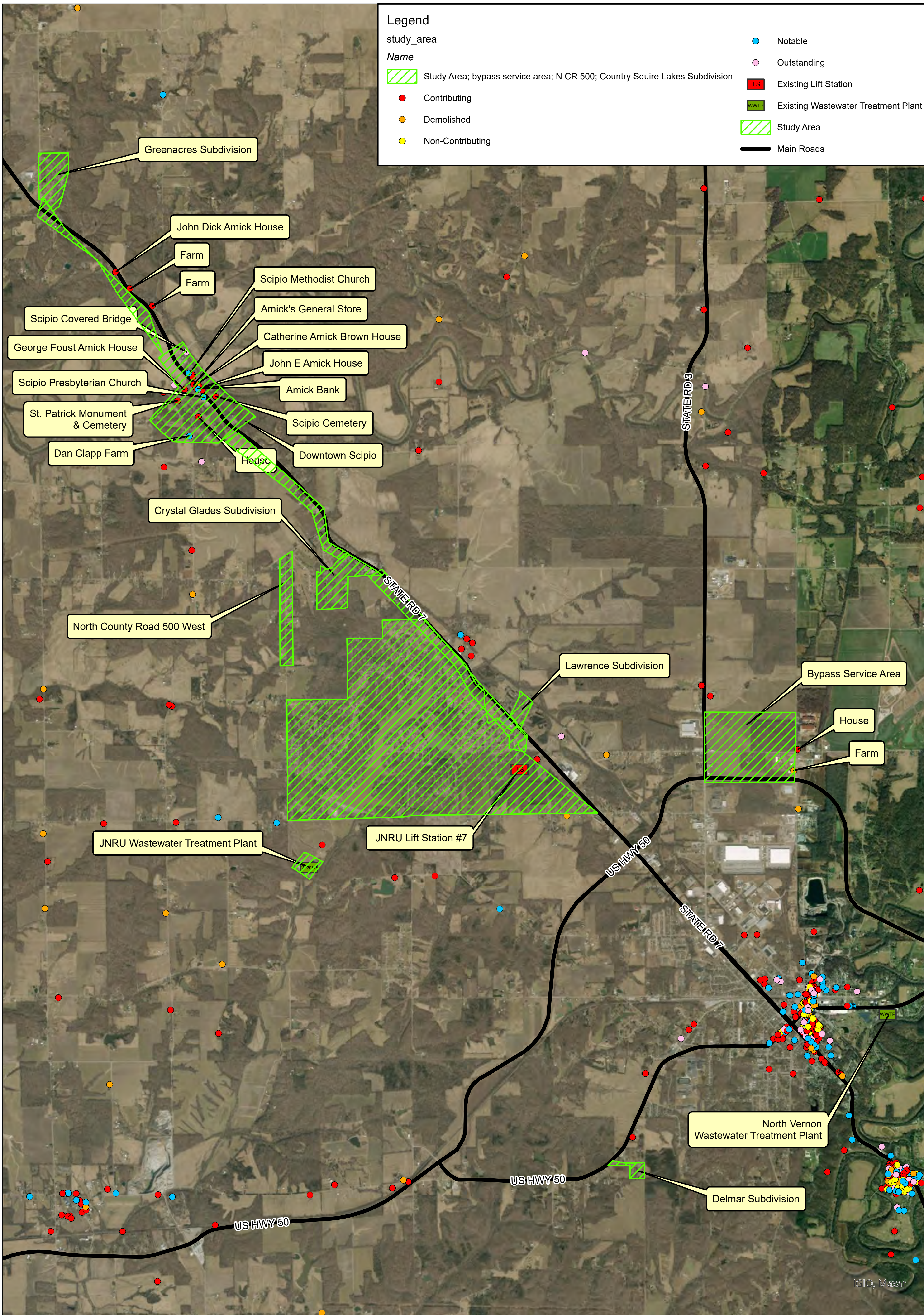

Figure 5.3
Jennings County Sanitary Master Plan
Historic Sites Map
Jennings County, Indiana

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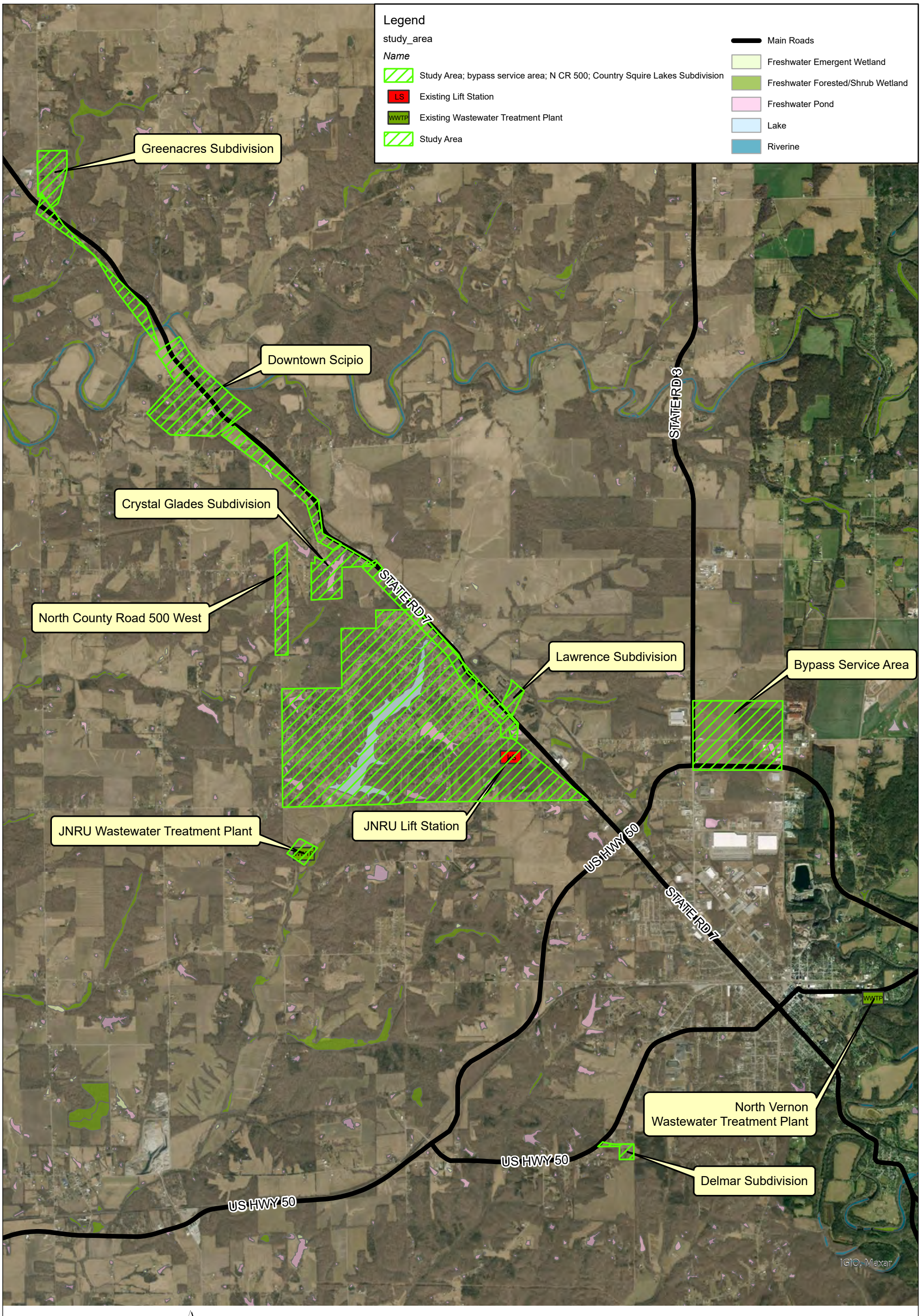

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Figure 5.4

Jennings County Sanitary Master Plan

Wetlands Map

Jennings County, Indiana

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Legend

study_area

Name

Study Area; bypass service area; N CR 500; Country Squire Lakes Subdivision

LS Existing Lift Station

WWTP Existing Wastewater Treatment Plant

Study Area

Main Roads

Floodway

Flood Zone 'AE'

Flood Zone 'A'

Greenacres Subdivision

Downtown Scipio

Crystal Glades Subdivision

North County Road 500 West

Lawrence Subdivision

Bypass Service Area

JNRU Wastewater Treatment Plant

JNRU Lift Station #7

North Vernon
Wastewater Treatment Plant

Delmar Subdivision

STATE RD 3

STATE RD 7

US HWY 50

STATE RD 7

US HWY 50

US HWY 50

WWTP

WWTP

©GIO, Maxar

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Graphic Scale (Feet)

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Scale: 1" =4,000'

Figure 5.5

Jennings County Sanitary Master Plan

Floodplain Map

Jennings County, Indiana

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Section Six – Selected Plan

6.1 Introduction

The primary goal of the previous sections of this report was to follow the various steps required to develop a plan of action to address the Agreed Order between IDEM and Jennings County for the unsewered subdivisions of Delmar, Lawrence, and Greenacres as well as additional improvements to other unsewered areas, and also to allow for compliance with the Agreed Order between IDEM and JNRU regrading the WWTP. This section discusses the evaluation of alternatives that were presented in Section 4 and ultimately presents the selection of a recommended plan. The selected plan will provide the basis for the next logical steps of design, permitting and construction as well as link them to the planning phase.

The criteria for evaluation include monetary, technical, reliability, implementation and environmental impact considerations. Monetary considerations were analyzed for each alternative using present worth cost analysis. The analysis was completed to meet the requirements of the Water Resources Reform and Development Act of 2014. A planning period of 20 years was used with a "real" discount rate of 2.0% (taken from OMB Circular A-94 Appendix C). For each alternative, costs were developed for construction, non-construction, annual operation and maintenance, short-lived assets (e.g. replacement) and salvage value.

Each alternative was evaluated using a decision matrix with a rating system from 1 to 4 with 1 being the worst/low value and 4 being the best/high value. The five criteria previously mentioned were each given a weight, which shows how important the criterion is relative to the others when making a selection. Based on discussions with the County Coalition (County, JNRU and City of North Vernon), primary weight was given to monetary, technical and reliability considerations (30% each), and less weight to implementation and environmental impact considerations (5% each). **Table 6.1** shows the decision matrix along with the value for each alternative relative to collection and treatment system alternatives and their rankings.

Table 6.1
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Alternative Selection Decision Matrix and Rating System

Value	Meaning
1	Worst/Difficult/Low
2	Medium/Fair
3	Good
4	Best/Easy/High

Alternative		Selection Rationale (Weight %)					Results	
		Monetary	Technical	Reliability	Implementation	Env. Impact	Weighted Score	Rank
		30%	30%	30%	5%	5%	Max=4	
Wastewater Collection & Conveyance System	Greenacres Alt 1	1	3	3	2	2	2.35	3
	Greenacres Alt 2	3	3	3	2	2	2.9	1
	Greenacres Alt 3	3	2	2	3	3	2.4	2
	Greenacres Alt 4	4	1	1	4	1	2.05	4
	Crystal Glades Alt 1	1	3	3	2	2	2.3	3
	Crystal Glades Alt 2	2	3	3	2	2	2.6	1
	Crystal Glades Alt 3	3	2	2	3	3	2.4	2
	Crystal Glades Alt 4	4	1	1	4	1	2.05	4
	N Co Rd 500 W Alt 1	2	3	4	2	3	2.95	1
	N Co Rd 500 W Alt 2	4	1	1	4	1	2.05	2
	Lawrence Alt 1	2	3	3	2	2	2.6	1
	Lawrence Alt 2	3	2	2	3	3	2.4	2
	Lawrence Alt 3	4	1	1	4	1	2.05	3
	JNRU LS#7 Alt 1	3	4	3	3	4	3.35	1
	JNRU LS#7 Alt 2	2	4	4	3	4	3.35	1
	JNRU LS#7 Alt 3	4	1	1	4	1	2.05	2
	Delmar Alt 1	2	3	4	2	3	2.95	1
	Delmar At 2	4	1	1	4	1	2.05	2
	US 50 Bypass Alt 1	2	3	4	2	3	2.95	1
	US 50 Bypass Alt 2	4	1	1	4	1	2.05	2

Alternative		Selection Rationale (Weight %)					Results	
		Monetary	Technical	Reliability	Implementation	Env. Impact	Weighted Score	Rank
		30%	30%	30%	5%	5%	Max=4	
JNRU Wastewater Treatment System	Base Alt 1	2	4	4	4	3	3.35	1
	Base Alt 2	2	4	4	4	3	3.35	1
	Base Alt 3	2	4	4	2	3	3.25	2
	Base Alt 4	4	1	1	4	1	2.05	3
	Ancillary Alt 1	4	4	4	3	3	3.90	1
	Ancillary Alt 2	2	3	3	4	4	2.80	2
	Ancillary Alt 3	2	3	3	4	4	2.80	2

6.2 Evaluation of Alternatives – Wastewater Collection and Conveyance System

Evaluations of the wastewater collection and conveyance system were based on considerations of alternatives within each subdivision/unsewered area within the County that was included in the planning study. In addition to evaluation within each area, consideration was given to the ability to feasibly acquire adequate funding for each project.

6.2.1 Greenacres Subdivision

From a monetary perspective Alternative 4 (No Action) is the most desirable option since it has no capital costs associated with it. However, it is not a preferrable alternative since it does not address the Agreed Order compliance related to untreated sanitary discharges in this area. Alternative 3 is the lowest capital cost of the reasonable options but with consideration to the number of customers added, and consideration of cost/user, Alternative 2 becomes more economical although the most expensive.

In terms of technical advantage and reliability, Alternatives 1 and 2 are equally preferred as they only rely on the two lift station systems, as opposed to Alternative 3 which also requires grinder pumps for each residence.

Regarding implementation and environmental impact, Alternative 3 is best choice as it minimizes deep trench excavation, versus Alternatives 1 and 2 which require gravity sewers and manholes that can be 10-20 feet deep depending on the grade.

Alternative 2 has the highest weighted average rating of 2.9 because it provides the best opportunity to service the most areas and number of users.

6.2.2 Crystal Glades Subdivision

From a monetary perspective Alternative 4 (No Action) is the most desirable option since it has no capital costs associated with it. However, it is not a preferrable alternative since, although not cited by IDEM, it does not address the known septic issues in the subdivision. Alternative 3 is the lowest capital cost as well as cost per customer added. Alternative 2 has a higher capital cost than Alternative 1, but has a better cost per customer added.

In terms of technical advantage and reliability, Alternatives 1 and 2 are equally preferred as they only rely on the two lift station systems, as opposed to Alternative 3 which also requires grinder pumps for each residence.

Regarding implementation and environmental impact, Alternative 3 is best choice as it minimizes deep trench excavation, versus Alternatives 1 and 2 which require gravity sewers and manholes that can be 10-20 feet deep depending on the grade.

Alternative 2 has the highest weighted average rating of 2.6 because it provides the best opportunity to service the most areas and number of users.

6.2.3 North County Road 500 West

This area has only one reasonable alternative to compare with the No Action alternative. Alternative 1 has the highest weighted average rating of 2.95.

6.2.4 Lawrence Subdivision

From a monetary perspective Alternative 3 (No Action) is the most desirable option since it has no capital costs associated with it. However, it is not a preferrable

alternative since it does not address the Agreed Order compliance related to improperly treated wastewater discharges in the subdivision. Alternative 2 is the lowest capital cost as well as cost per customer added.

In terms of technical advantage and reliability, Alternatives 1 is preferred as it only relies on a single lift station, as opposed to Alternative 2 which requires grinder pumps for each residence.

Regarding implementation and environmental impact, Alternative 2 is best choice as it minimizes deep trench excavation, versus Alternatives 1 which requires gravity sewers and manholes that can be 10-20 feet deep depending on the grade plus a lift station near the 100-year flood zone.

Alternative 1 has the highest weighted average rating of 2.6 because it provides the best opportunity to service the most areas and avoids the long term operation and maintenance costs associated with individual grinder pumps.

6.2.5 JNRU Lift Station #7

From a monetary perspective Alternative 3 (No Action) is the most desirable option since it has no capital costs associated with it. However, it is not a preferrable alternative since it does not provide capacity for any additional flows from unserved areas in the future, doesn't address the existing infiltration, nor does it address the electrical control panel code violations. Alternative 1 is the lowest capital cost, but does not increase the capacity of the lift station. Alternative 2 is the highest capital cost, but provides the additional capacity for all potential considered future flows.

In terms of technical advantage, Alternative 1 and 2 are equally preferred as they both replace the existing pumps and controls.

Alternative 2 is the most reliable as it will handle the existing flows as well as the anticipated future flows.

Regarding implementation and environmental impact, Alternative 1 and 2 are equally preferred as they perform the same activities, the only difference being the pump size.

Alternative 1 and 2 both have the highest weighted average rating of 3.35.

6.2.6 Delmar Subdivision

This area has only one reasonable alternative to compare with the No Action alternative, which does not address the noted violations included in the Agreed Order. Alternative 1 has the highest weighted average rating of 2.95.

6.2.7 US 50 Bypass Service Area

This area has only one reasonable alternative to compare with the No Action alternative which offers no plan to serve development which could occur in the area. Alternative 1 has the highest weighted average rating of 2.95.

6.3 Evaluation of Alternatives –Wastewater Treatment – JNRU Facility

6.3.1 Base Biological Treatment Alternatives

From a monetary perspective Alternative 4 (No Action) is the most desirable option since it has no capital costs associated with it. However, it is not a preferrable alternative since it does not address the Agreed Order compliance, nor the operational issues with the existing facility. Alternatives 2 is the lowest capital cost as well as the lowest Net Present Worth.

In terms of technical advantage, Alternatives 1, 2 and 3 are equally preferred as they are all proven treatment technologies and systems.

Alternatives 1, 2 and 3 are also equally reliable to handle the existing and future flows.

Regarding implementation, Alternatives 1 and 2 are preferrable to Alternative 3 due to the staged conversion of the MSABP into an Extended Aeration system vs building a separate system that doesn't affect the existing treatment process during construction.

For environmental impact, Alternative 1, 2 and 3 are equally preferred as they will disturb roughly the same amount of land within the WWTP property.

Alternative 1 and 2 both have the highest weighted average rating of 3.35.

6.3.2 Ancillary Biosolids Alternatives

From a monetary perspective Alternative 1 has the lowest capital cost. Alternatives 2 and 3 have much higher capital cost.

In terms of technical advantage, Alternatives 1 is the preferred as it doesn't require as many controls or specialized operations.

Alternatives 1 is the most reliable as it has less equipment that could malfunction or breakdown.

Regarding implementation and environmental impact, Alternatives 2 and 3 are equally preferred over Alternative 1 as they are closed systems that interconnect and have less opportunities for spills.

Alternative 1 has the highest weighted average rating of 3.95.

6.4 Selected Plan – Wastewater Collection and Conveyance System

The list of alternatives described in Section 4.2 is extensive and represents a long-term plan that will extend beyond the recommendations in the PER. The selected plan includes adding a sewer system to Greenacres Subdivision (Alternative 2) as described in Section 4.2.2 which includes Scipio; adding a sewer system to Crystal Glades Subdivision (Alternative 1) as described in Section 4.2.5; adding a sewer system to Lawrence Subdivision (Alternative 1) as described in Section 4.2.11; and making improvements to JNRU Lift Station #7 (Alternative 2) as described in Section 4.2.15. The following is a summary of the projects that were recommended for inclusion in the selected plan:

The recommended project for the Greenacres Subdivision is Alternative 2 – Proposed Gravity Sewer including Downtown Scipio, Lift Station(s) and Force Main to the proposed Crystal Glades Collection System. This alternative would involve the construction of approximately 7,300 lineal feet of 8" gravity sewer system within the subdivision. This gravity sewer would collect into the new primary lift station with a design capacity of 90 gpm. Due to the distance between Greenacres and the anticipated discharge location (Crystal Glades) , it was determined that two lift stations would be needed for this alternative. The primary lift station

would be in the Southwest corner of the subdivision. The secondary lift station would be located along State Road 7 in Scipio. Also included is approximately 8,200 lineal feet of 8" gravity sewer in "downtown" Scipio to take advantage of the secondary lift station's service area and provide service for the existing residential and commercial users present. The secondary lift station has a design capacity of 150 gpm and will discharge into the proposed Crystal Glades gravity sewer system. The force main for both lift stations will be 4" and approximately 21,500 lineal feet in total length. Included at each lift station are provisions for odor control due the length of force main, long detention times, and low design flow. This alternative would address the issues of direct discharge of improperly treated wastewater in the Green Acres subdivision by providing a connection to the JNRU system and the sewage would ultimately be treated at the JNRU WWTP.

The recommended project for Crystal Glades Subdivision is Alternative 1 – Proposed Gravity Sewer, Lift Station and Force Main to JNRU Lift Station #7. This alternative would involve the construction of approximately 6,100 lineal feet of 8" gravity sewer system within the subdivision. The subdivision is split by the lake and the dam to the south so each side of the lake requires a lift station. The primary lift station on the west side of the lake with a design capacity of 45 gpm will discharge into the gravity sewer system on the east side of the lake that feeds the secondary lift station through approximately 2,300 lineal feet of 3" force main. The secondary lift station has a design capacity of 200 gpm to include potential flows from Greenacres and Scipio. The secondary lift station pumps through approximately 11,200 lineal feet of 6" force main along State Road 7 and discharges into JNRU's Lift Station #7. Included at each lift station are provisions for odor control due the length of force main, long detention times, and the low design flow. This alternative would connect currently unsewered residents so the sewage could be treated at the JNRU WWTP.

The recommended project for the Lawrence Subdivision is Alternative 1 – Proposed Gravity Sewer, Lift Station and Force Main with discharge to JNRU Lift Sation #7. This alternative would involve construction of approximately 2,600 lineal feet of 8" gravity sewer system within the subdivision. This gravity sewer would collect and convey flows to the proposed lift station with a design capacity of 30 gpm. The 4" force main from the proposed lift station will extend a length of 2,200 lineal feet, crossing SR 7 and discharge into the JNRU Lift Station #7. This alternative would address the discharges of improperly treated wastewater in and near the

subdivision by providing a connection to the JNRU system and the sewage would ultimately be treated at the JNRU WWTP.

The recommended project for the JNRU Lift Station #7 is Alternative 2 – Proposed Structural Improvements and Pump Replacement with increased capacity. This alternative would include replacing the existing pumps with a higher capacity to handle the additional service areas proposed, replacing the existing level switches, replacing and relocating the electrical control panel to meet current electrical code, and structural repairs the existing gravity sewer penetration into the wet well.

Figures 6.1, 6.2, 6.3, and 6.4 show the recommended collection and conveyance system elements of the selected plan.

Construction costs for the recommended projects are shown in **Table 6.2**. The construction cost, including contingency, is estimated to be $14,850,000.

6.5 Selected Plan – Wastewater Treatment – JNRU Facility

The recommended project from the list of alternatives described in Section 4.3 is Base Alternative 2 – Aero-Mod SEQUOX System. This alternative would involve replacing the MSABP biological process with an Aero-Mod SEQUOX Biological Nutrient Removal process to match the capacity of the existing plant at 0.35 MGD. This system incorporates aerobic biological treatment, clarification, and RAS/WAS pumping into a single compartmented concrete basin. Effluent from the Aero-Mod system will connect to the existing line discharging to the existing UV Disinfection System. Sludge from the Aero-Mod system will be pumped to the repurposed MSABP basin for aerobic digestion and sludge storage. Solids disposal will be achieved by dumpster-based horizontal dewatering filter bags. Necessary ancillary equipment for this alternative include new controls and a control building for the new equipment.

This alternative will also eliminate the grit handling system by bypassing the Headcell grit separator completely as this is not necessary with the new treatment process given the influent wastewater quality. This will also eliminate the Eutek Tea Cup system allowing both

systems to be decommissioned. The NPDES permit would be revised to reflect this process change along with the new design.

Additionally, this alternative will include the removal of sludge from the bottom of the lagoons. This will provide for compliance with the Agreed Order JNRU has with IDEM.

Figure 6.5 shows the recommended wastewater treatment system project of the selected plan.

Construction costs for the recommended projects are shown in Table 6.3. The construction cost, including contingency, is estimated to be $10,603,000.

Table 6.4 shows the total project costs for the Collection and Conveyance Systems and the Wastewater Treatment Improvements. The total project cost including construction, construction contingency, non-construction services and fees is estimated to be $30,200,000

6.6 Proposed Project Schedule

The selected plan is proposed to be implemented as indicated in Table 6.5 but is contingent on timing for securing funding from all anticipated funding agencies.

6.7 Contract Operations

Greenacres, Crystal Glades, and Lawrence Subdivisions are currently unsewered and do not contract for any of its operations or maintenance needs. It is anticipated that Jennings Northwest Regional Utility will operate and maintain the proposed wastewater facilities for the new sanitary collection systems.

6.8 Green Project Reserve

No elements in the recommended project are being considered for green project reserve inclusion.

Table 6.2
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Collection and Conveyance System Recommended Projects
Estimated Construction Costs

I. Greenacres Subdivision					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Sanitary Sewer 8" 0-10' dp.	4,855	LF	$100	$485,500
2	Sanitary Sewer 8" 10-20' dp.	2,415	LF	$150	$362,250
3	8" x 6" Wye Sanitary Lateral Connection	72	EA	$200	$14,400
4	6" Sanitary Sewer Lateral (20' each)	1,440	LF	$75	$108,000
5	Std. MH 0-10' dp.	19	EA	$7,500	$142,500
6	Std. MH 10-20' dp.	7	EA	$12,000	$84,000
7	Drop MH	3	EA	$15,000	$45,000
8	Lift Station 1 Complete	1	EA	$350,000	$350,000
9	LS 1 Odor Control	1	EA	$50,000	$50,000
10	Sanitary Sewer 8" 0-10' dp. (Scipio)	2,200	LF	$100	$220,000
11	Sanitary Sewer 8" 10-20' dp. (Scipio)	6,000	LF	$150	$900,000
12	8" x 6" Wye Sanitary Lateral Connection (Scipio)	48	EA	$200	$9,600
13	6" Sanitary Sewer Lateral (20' each) (Scipio)	960	LF	$75	$72,000
14	Std. MH 0-10' dp. (Scipio)	9	EA	$7,500	$67,500
15	Std. MH 10-20' dp. (Scipio)	18	EA	$12,000	$216,000
16	Lift Station 2 Complete	1	EA	$350,000	$350,000
17	LS 2 Odor Control	1	EA	$75,000	$75,000
18	LS 1 Force Main 4" (HDD Installation)	9,200	LF	$75	$690,000
19	LS 1 Force Main 4" (Creek Crossing)	200	LF	$200	$40,000
20	LS 1 Force Main 4" (Highway Crossing)	100	LF	$200	$20,000
21	LS 1 FM Air Release Valves (4" FM)	5	EA	$12,000	$60,000
22	LS 2 Force Main 4" (HDD Installation)	12,300	LF	$75	$922,500
23	LS 2 Force Main 4" (Highway Crossing)	100	LF	$200	$20,000
24	LS 2 FM Air Release Valves (4" FM)	6	EA	$12,000	$72,000
25	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
26	Utility Electrical Service to LS Allowance	2	EA	$75,000	$150,000
27	Granular Backfill	15,170	LF	$25	$379,250
28	Pavement Repair	14,970	LF	$60	$898,200
29	Drive Repair	200	LF	$100	$20,000
30	Rock Excavation (Undistributed)	630	CY	$175	$110,250
31	Erosion Control	1	LS	$50,000	$50,000
32	Maintenance of Traffic	1	LS	$20,000	$20,000
33	Additional Site Restorations	1	LS	$40,000	$40,000
34	Construction Engineering	1	LS	$40,000	$40,000
35	Mobilization and Demobilization (5%)	1	LS	$355,100	$355,100
	Subtotal Greenacres Subdivision Construction Costs				**$7,457,050**

II. Crystal Glades Subdivision					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Sanitary Sewer 8" 0-10' dp.	3,500	LF	$100	$350,000
2	Sanitary Sewer 8" 10-20' dp.	700	LF	$150	$105,000
3	8" x 6" Wye Sanitary Lateral Connection	34	EA	$200	$6,800
4	6" Sanitary Sewer Lateral (20' each)	680	LF	$75	$51,000
5	Std. MH 0-10' dp.	11	EA	$7,500	$82,500
6	Std. MH 10-20' dp.	2	EA	$12,000	$24,000
7	Lift Station Complete	1	EA	$350,000	$350,000
8	LS Odor Control	1	EA	$50,000	$50,000
9	LS Force Main 2" (HDD Installation)	4,700	LF	$50	$235,000
10	LS Force Main 2" (Creek Crossing)	100	LF	$200	$20,000
11	LS FM Air Release Valves (2" FM)	2	EA	$8,000	$16,000
12	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
13	Utility Electrical Service to LS Allowance	1	EA	$75,000	$75,000
14	Granular Backfill	4,000	LF	$25	$100,000
15	Pavement Repair	3,800	LF	$60	$228,000
16	Drive Repair	100	LF	$100	$10,000
17	Rock Excavation (Undistributed)	55	CY	$175	$9,625
18	Erosion Control	1	LS	$25,000	$25,000
19	Maintenance of Traffic	1	LS	$10,000	$10,000
20	Additional Site Restorations	1	LS	$2,000	$2,000
21	Construction Engineering	1	LS	$15,000	$15,000
22	Mobilization and Demobilization (5%)	1	LS	$89,200	$89,200
	Subtotal Crystal Glades Subdivision Construction Costs				**$4,314,875**

III. Lawrence Subdivision					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Sanitary Sewer 8" 0-10' dp.	2,385	LF	$100	$238,500
2	Sanitary Sewer 8" 10-20' dp.	245	LF	$150	$36,750
3	8" x 6" Wye Sanitary Lateral Connection	29	EA	$200	$5,800
4	6" Sanitary Sewer Lateral (20' each)	580	LF	$75	$43,500
5	Std. MH 0-10' dp.	10	EA	$7,500	$75,000
6	Std. MH 10-20' dp.	1	EA	$12,000	$12,000
7	Lift Station Complete	1	EA	$350,000	$350,000
8	LS Force Main 2" (HDD Installation)	2,150	LF	$50	$107,500
9	LS Force Main 2" (Highway Crossing)	100	LF	$200	$20,000
10	LS FM Air Release Valves (2" FM)	0	EA	$8,000	$0
11	Force Main Discharge Manhole Lining	3	EA	$6,000	$18,000
12	Utility Electrical Service to LS Allowance	1	EA	$75,000	$75,000
13	Granular Backfill	2,615	LF	$25	$65,375
14	Pavement Repair	2,515	LF	$60	$150,900
15	Drive Repair	100	LF	$100	$10,000

16	Rock Excavation (Undistributed)	20	CY	$175	$3,500
17	Erosion Control	1	LS	$25,000	$25,000
18	Maintenance of Traffic	1	LS	$10,000	$10,000
19	Additional Site Restorations	1	LS	$2,000	$2,000
20	Construction Engineering	1	LS	$15,000	$15,000
21	Mobilization and Demobilization (5%)	1	LS	$63,200	$63,200
	Subtotal Lawrence Subdivision Construction Costs				**$1,327,025**
IV. JNRU Lift Station #7 Improvements					
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Total Price**
1	Site Work	1	LS	$25,000	$25,000
2	Structural & Pump Upgrades	1	LS	$250,000	$250,000
3	Electrical	1	LS	$75,000	$75,000
4	Erosion Control	1	LS	$10,000	$10,000
5	Miscellaneous	1	LS	$25,000	$25,000
6	Mobilization and Demobilization (5%)	1	LS	$14,300	$19,300
	Subtotal JNRU Lift Station #7 Improvements Construction Costs				**$404,300**
V. Recommended Project					
	Subtotal Recommended Project Construction Costs				**$13,500,000**
	Construction Contingency (10%)				$1,350,000
	Total Construction Cost				**$14,850,000**

Table 6.3
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Wastewater Treatment Recommended Projects
Estimated Construction Costs

I. Wastewater Treatment System					
Item	Description	Quantity	Unit	Unit Price	Total Price
1	Aero-Mod SEQUOX Equipment	1	LS	$1,514,000	$1,514,000
2	Aero-Mod SEQUOX Concrete Tank	1	LS	$2,012,000	$2,012,000
3	Aero-Mod Clarifier Roof	1	LS	$125,000	$125,000
4	Aero-Mod Controls & Equipment Building	1	LS	$616,000	$616,000
5	Convert MSABP to Aerobic Digester & Sludge Storage	1	LS	$892,000	$892,000
6	Digester Submersible Pumps w/ VFDs	2	EA	$62,000	$124,000
7	Digester Pump Station	1	LS	$133,000	$133,000
8	Dewatering System	1	LS	$272,000	$272,000
9	Lagoon Sludge Removal	1	LS	$593,000	$593,000
10	Non-Potable Water System	1	LS	$138,000	$138,000
11	Headworks Bypass Channel	1	LS	$121,000	$121,000
12	Emergency Backup Generator	1	LS	$200,000	$200,000
13	Electrical and Controls	1	LS	$1,713,000	$1,713,000
14	Site Work	1	LS	$131,000	$131,000
15	Erosion Control	1	LS	$82,000	$82,000
16	Seeding & Restoration	1	LS	$66,000	$66,000
17	Construction Engineering	1	LS	$176,000	$176,000
18	Mobilization/Demobilization/Insurance/Bonds	1	LS	$701,000	$701,000
	Subtotal Wastewater Treatment System Construction Costs				**$9,639,000**
II. Recommended Project					
	Subtotal Recommended Project Construction Costs				**$9,639,000**
	Construction Contingency (10%)				$964,000
	Total Construction Cost				**$10,603,000**

Table 6.4
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Recommended Projects
Estimated Total Project Costs

Item	Description	Amount
I.	Construction Costs – Collection and Conveyance	
	Subtotal Construction Costs	**$13,500,000**
	Construction Contingency (10%)	$1,350,000
	Construction Costs – Wastewater Treatment	
	Subtotal Construction Costs	**$9,639,000**
	Construction Contingency (10%)	$964,000
	Total Construction Costs	**$25,450,000**
II.	Non-Construction Costs	
	Survey	$400,000
	Design & Permitting	$1,950,000
	Bidding	$50,000
	Construction Engineering	$450,000
	Construction Observation	$900,000
	Easements	$100,000
	Land Acquisition	$500,000
	Legal Services	$100,000
	Financial Services	$120,000
	Bond Counsel	$75,000
	Grant Administration	$60,000
	Labor Standards	$35,000
	Environmental Review	$10,000
	Total Non-Construction Costs	**$4,750,000**
	Estimated Total Project Costs	**$30,200,000**

1. Final Non-Construction Costs to be determined prior to design phase.

Table 6.5
Jennings County Sanitary Master Plan
Wastewater System Improvements PER
Proposed Project Schedule

Item	Description	Date
1	Acceptance of PER by SRF	October 2025
2	Develop Construction Plans & Bid Documents	November 2025 – June 2026
3	Submit Construction Permits	June 2026
4	Advertise and Bid Project	October 2026
5	Close of SRF Funding	January 2027
6	Construct Project	February 2027 – February 2028

Legend

- Proposed Manhole
- Proposed Sanitary Sewer
- Proposed Sanitary Sewer
- Proposed Sanitary Sewer
- Proposed Force Main
- LS Proposed Lift Station

study_area

Name

- Greenacres Subdivision

Streets

TIGER_FULLNAME

- Main Roads

N CO RD 700 W

W MARILANE

N GREENACRES RD

N BROOKS LN

Greenacres Subdivision
(72 Homes)

Primary Lift Station

STATE RD 7

E CO RD 800 N

IGIO, Maxar

N

Graphic Scale (Feet)

0 300 600

Scale: 1" =300'

Figure 6.1a

Jennings County Sanitary Master Plan

Greenacres Subdivision Recommended Alternative
Gravity Sewer

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan\Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

Legend

- Scipio
- Proposed Manhole
- Proposed Sanitary Sewer
- Proposed Lift Station (LS)
- Proposed Force Main
- Main Roads
- Stream/Creek

Sand Creek Crossing

Secondary Lift Station

Downtown Scipio (54 Homes & 6 Commercial)

E CO RD 700 N

STATE RD 7

WATER ST

PERRY ST

MARKET ST

N WASHINGTON ST

N ADAMS ST

SOUTH ST

N CO RD 575 W

W CO RD 600 N

1GIO, Maxar, Microsoft

N

Graphic Scale (Feet)

0 500 1,000

Scale: 1" =500'

Figure 6.1b

Jennings County Sanitary Master Plan

Greenacres Subdivision Recommended Alternative - Scipio Addition Gravity Sewer

Jennings County, Indiana

HWC ENGINEERING

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Legend

- Greenacres Subdivision
- Crystal Glades Subdivision
- Scipio
- LS Proposed Lift Station
- Proposed Force Main
- Main Roads
- Stream/Creek

W CO RD 950 N
ROSSROAD CREEK DR
N CO RD 70
Greenacres Subdivision
N BROOKS LN
Primary Lift Station
N CO RD 600 W
N CO RD 500 W
E CO RD 800 N
N CO RD 380 W
Nettle Creek Crossing
W CO RD 750 N
N CO RD 400 W
W CO RD 740 N
N CO RD 480 W
E CO RD 7
Sand Creek Crossing
Secondary Lift Station
WATER ST
PERRY ST
N ADAMS ST
Scipio
STATE RD 7
W CO RD 650 N
W CO RD 600 N
BLOSSOM DR
W CO RD 580 N
N CO RD 650 W
N CO RD 575 W
W CO RD 500 N
Crystal Glades Subdivision
N SUNSET GLADES BLVD
W CRYSTAL ST
BRANDYWYNE DR
STEPELWORTH WAY
PRIMSHIRE LN
BUCKINGHAM DR
IGIO, Maxar

N

Graphic Scale (Feet)

0 2,000 4,000

Scale: 1" =2,000'

Figure 6.1c

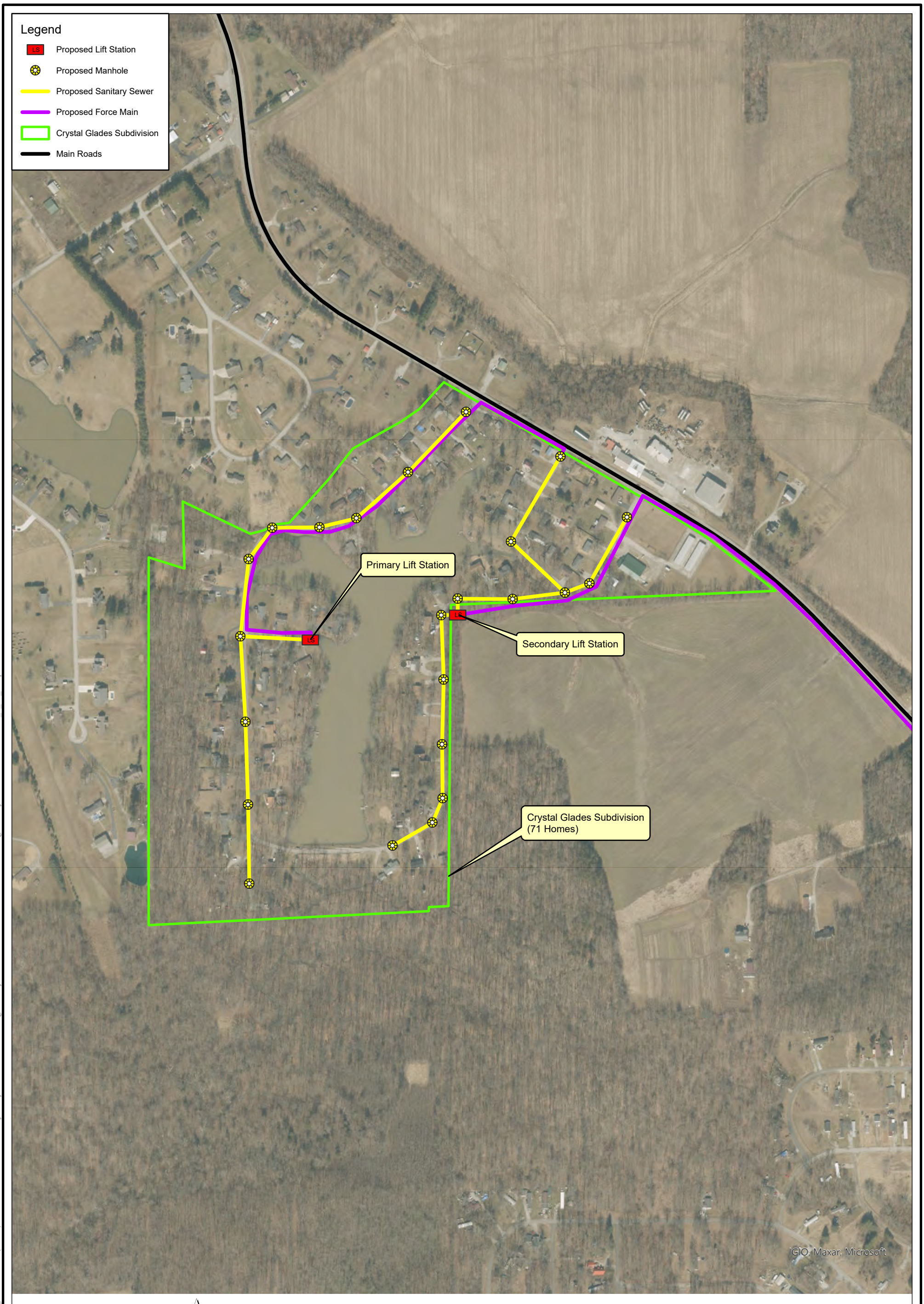
Jennings County Sanitary Master Plan

Greenacres Subdivision Recommended Alternative - Force Main to Crystal Glades

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx



N

Graphic Scale (Feet)

0 400 800

Scale: 1" =400'

Figure 6.2a

Jennings County Sanitary Master Plan

Crystal Glades Subdivision Recommended Alternative Gravity Sewer

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx

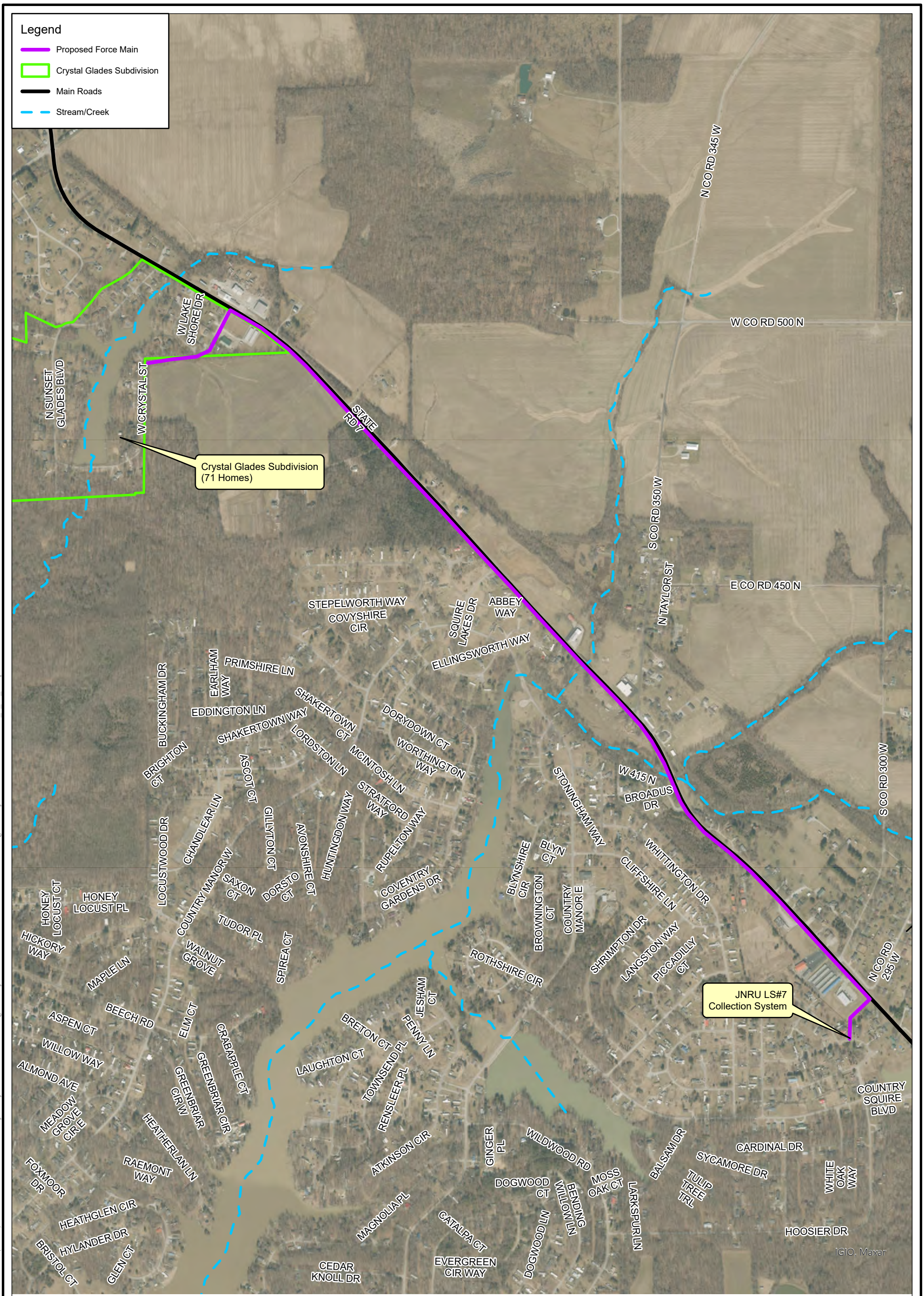


Figure 6.2b

Jennings County Sanitary Master Plan

Crystal Glades Subdivision Recommended Alternative Gravity Sewer

Jennings County, Indiana

HWC ENGINEERING

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Legend

- LS — Proposed Lift Station
- Proposed Manhole
- Proposed Sanitary Sewer
- Proposed Force Main
- Boundary Lines
- Existing 8" Gravity Sewer
- Main Roads
- Stream/Creek
- Floodway
- Flood Zone 'AE'
- Flood Zone 'A'

Sixmile Creek

Proposed Lift Station

S CO RD 300 W

N CO RD 295 W

Lawrence Subdivision
(29 Homes)

STATE RD 7

HAMPTON CT

DORVER LN

Country Squire Lakes Boundary

JNRU LS #7
Collection System

ASHLEY DR

1GIO, Maxar, Microsoft

N

Graphic Scale (Feet)

0 200 400

Scale: 1" =200'

Figure 6.3

Jennings County Sanitary Master Plan

Lawrence Subdivision Recommended Alternative
Gravity Sewer

Jennings County, Indiana

HWC ENGINEERING

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Legend

- Existing Lift Station (LS)
- Existing 2" Force Main
- Existing 6" Force Main
- Existing 6" Vacuum Sewer
- Existing 8" Gravity Sewer
- Boundary Lines
- Main Roads
- Stream/Creek

DORVER LN
HAMPTON CT
WHITTINGTON DR
WENTWORTH PL
ASHLEY DR
COUNTRY SQUIRE BLVD
CARDINAL DR
SYCAMORE DR
TULIP TREE TRL
WHITE OAK WAY
HOOSIER DR
STATE RD 7
LS

Alternative 2 - Increase Capacity
Replace Pumps and Level Switches, Replace and Relocate Control Panel, and Repair Wetwell Pipe Penetration

IGIO, Maxar, Microsoft

N

Graphic Scale (Feet)

0 200 400

Scale: 1" =200'

Figure 6.4

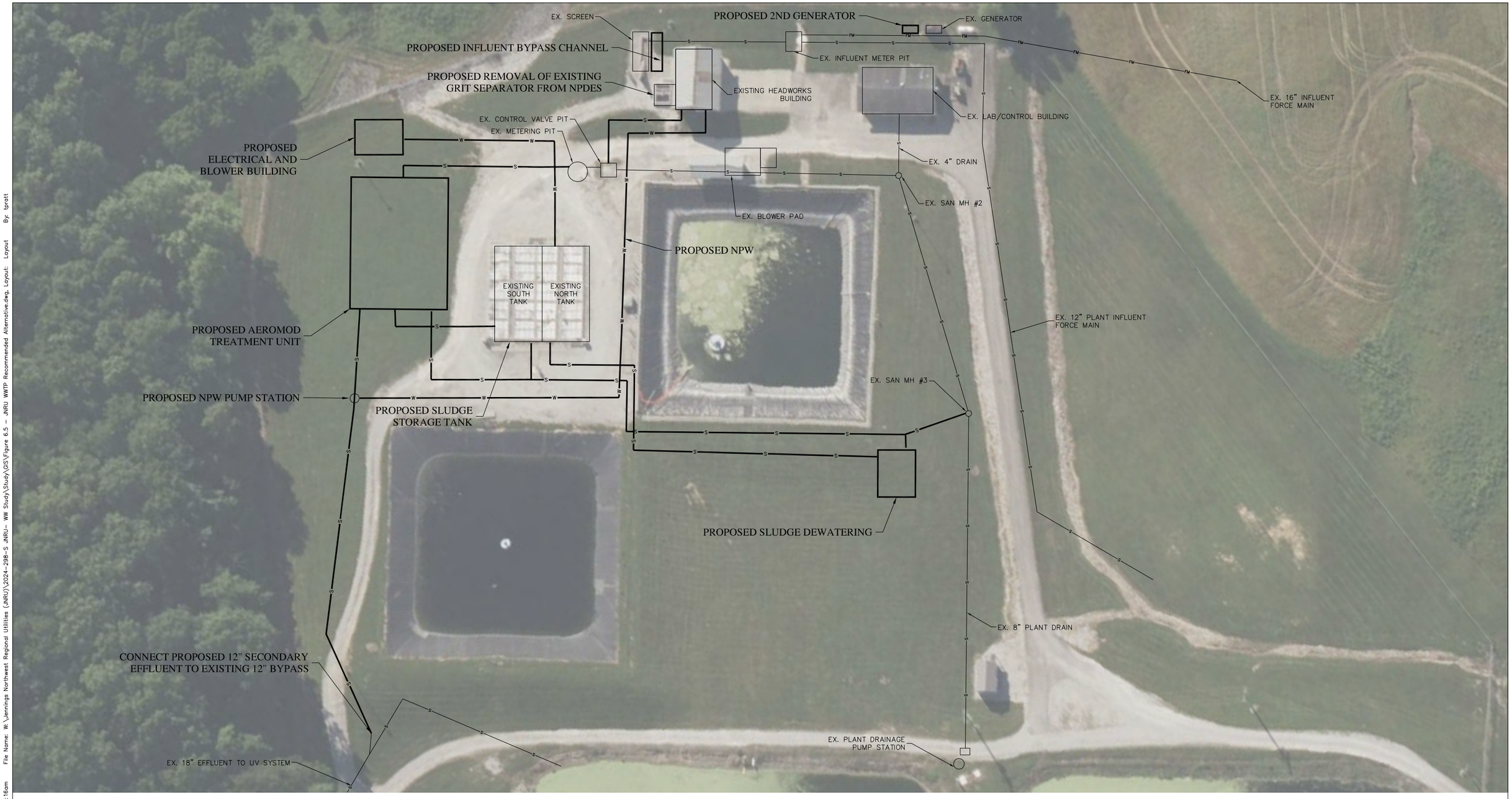
Jennings County Sanitary Master Plan

JNRU LS#7 Recommended Alternative

Jennings County, Indiana

HWC ENGINEERING

Path: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\2024-298 Jennings County Sewer Master Plan PER\2024-298 Jennings County Sewer Master Plan PER_1_14_25.aprx



GRAPHIC SCALE

0' 60' 120'

(IN FEET)

FIGURE 6.5
JENNINGS COUNTY SANITARY MASTER PLAN
JNRU WWTP RECOMMENDED ALTERNATIVE
AERO-MOD SEQUOX SYSTEM

JENNINGS COUNTY, INDIANA
MARCH 2025

HWC ENGINEERING

Plot Date: Mar 24, 2025 Plot Time: 9:16am File Name: W:\Jennings Northwest Regional Utilities (JNRU)\2024-298-S JNRU- WW Study\Study\GIS\Figure 6.5 – JNRU WWTP Recommended Alternative.dwg, Layout: Layout By: tpratt

Section Seven – Legal, Financial & Managerial Capabilities

7.1 Introduction

The following documents outline Jenning County's legal, financial and managerial capabilities to implement the recommended plan for the project areas and includes the signed Authorized Representative and PER Acceptance resolutions and the completed SRF Project Cost/Financing Information Form.

A preliminary sewer rate analysis is being prepared by Reedy Financial Group, which will be included in **Appendix C** once complete. The rate analysis will show the impact of the selected plan to offer a suggested loan payment schedule, and recommended sewer rates for JNRU and North Vernon customers that would enable Jennings County to pay for the selected plan project loan.

Table 7.1 was prepared in accordance with the preliminary sewer rate analysis for selected plan projects.

Jennings County will develop a Fiscal Sustainability Plan (to be included in the Asset Management Plan) that meets the minimum requirements listed in the Federal Water Pollution Control Act Section 603(d)(1)(E)(i) and will submit a completed FSP Certification Form (or AMP Certification Form inclusive of the FSP) prior to request for final disbursement related to the project.

As noted above, in conjunction with the Fiscal Sustainability Plan, Jennings County will develop an Asset Management Program that meets the requirements defined by the State Revolving Fund's Asset Management Program Guidelines pursuant to Indiana Code 5-1.2-10-16 and will submit a completed Asset Management Program Certification Form (inclusive of the FSP) prior to request for final disbursement related to the primary project.

Table 7-1

SRF PROJECT FINANCING INFORMATION
For Selected Plan Projects

1. Project Cost Summary

a. Wastewater Collection & Conveyance System Improvements	$13,500,000
b. Wastewater Treatment System Improvements	$9,639,000
c. Contingencies (should not exceed 10% of construction cost)	$2,314,000
d. Non-construction Cost	$4,750,000

e.g., engineering/design services, field exploration studies, project management & construction inspection, legal & administrative services, land costs (including capitalized costs of leased lands, ROWs, & easements), start-up costs (e.g., O&M manual, operator training).

e. **Total Project Cost** (lines a+b+c+d)	**$30,200,000**
f. Total ineligible SRF costs* (see next page)	$000

* Total ineligible SRF costs will not be covered by the SRF loan.

g. Other funding sources (list other grant/loan sources & amounts)

(1) Local Funds (hook-on fees, connection fees, capacity fees, etc.)	$0.00
(2) Cash on hand	$0.00
(3) Community Development Block Grant - Community Focus Fund (CFF)	$000
(4) US Dept. of Agriculture Rural Development (RD)	$000
(5) Other	
Total Other Funding Sources	**$000**

2. **SRF Loan Amount** (line e minus line item f+g*) **$30,200,000**

* If there are adequate funds available under (g) to cover (f) then subtract (g) only.

3. Monthly User Rates - TBD

4. Financial Advisor

a. Firm: Reedy Financial Group

b. Name: Katelyn Shafer

c. Phone Number: 317-820-3440

5. Bond Counsel

a. Firm: To Be Determined

b. Name: _____

c. Phone Number: _____

The following costs are *not eligible* for SRF reimbursement:

1. Land cost (*unless it's for sludge application*) $0.00

   Only the actual cost of the land is **not eligible**; associated costs (such as attorney's fees, site title opinion and the like) **are eligible**.

2. Materials & work done on private property $000.00

   (*Installation/repair of laterals, including disconnection of inflow into laterals; abandonment of on-site systems [septic tank or mound systems]).* Grinder pumps, vacuum stations and other appurtenances/installations on private property to treat/transport ARE fundable IF owned and maintained by the participant.

3. Grant applications and income surveys done for other agencies (e.g., OCRA, RUS, etc.).

   $0.00

4. Any project solely designed to promote economic development and growth is ineligible.

   $0.00

5. Costs incurred for preparing NPDES permit applications and other tasks unrelated to the SRF project.

   $0.00

6. Cleaning of equipment, such as digesters, sand filters, grit tanks and settling tanks. These items should have been maintained through routine operation, maintenance and replacement by the political subdivision. Sewer cleaning is **ineligible** for SRF *unless* the cleaning is required for sewer rehabilitation such as slip-lining and cured in place piping (CIPP)

   $0.00

AUTHORIZED REPRESENTATIVE RESOLUTION

WHEREAS, the Jennings Northwest Regional Utility of Jennings County, Indiana (PARTICIPANT) have plans for a wastewater infrastructure improvements project to meet State and Federal regulations, and the PARTICIPANT intends to proceed with the construction of such works:

NOW, THEREFORE, BE IT RESOLVED by the Utility Board, the governing body of the PARTICIPANT, that:

1. Brian Hatfield, Jennings Northwest Regional Utility Board President be authorized to make application for an SRF Loan and provide the State Revolving Fund Loan Program such information, data and documents pertaining to the loan process as may be required, and otherwise act as the authorized representative of Jennings County.

2. The PARTICIPANT agrees to comply with the Indiana Finance Authority, State of Indiana and Federal requirements as they pertain to the SRF.

3. That two copies of the resolution be prepared and submitted as part of the Indiana Finance Authority Preliminary Engineering Report.

WHEREAS, the PARTICIPANT has adopted this Resolution dated this 12 day of March, 2025.

JNRU Utility Board

Marshall Jenkins, Vice President

Michael Gerth, Secretary/Treasurer

Judi Johnson-Stevens, Member

Dale Boyd, Member

Attest: Andrew Klescht
Andrew Klescht, Manager

Approved and signed by the Utility Board President this 12 day of March, of 2025.

Brian Hatfield, President

Attest: Andrew Klescht
Andrew Klescht, Manager

PER ACCEPTANCE RESOLUTION

WHEREAS, the Jennings Northwest Regional Utility of Jennings County, Indiana (PARTICIPANT) has caused a Preliminary Engineering Report, PER, dated March 2025, to be prepared by the consulting firm of HWC Engineering; and

WHEREAS, said PER has been presented to the public at a public hearing held _____, 2025, for their comments; and

WHEREAS, the PARTICIPANT's Board finds that there was not sufficient evidence presented in objection to the recommended project in the Preliminary Engineering Report.

NOW, THEREFORE BE IT RESOLVED THAT:

The Wastewater Improvements Preliminary Engineering Report dated March 2025 be approved and adopted by the PARTICIPANT's Board; and

That said PER be submitted to the State Revolving Fund Loan Program for review and approval.

Passed and adopted by the PARTICIPANT's Board this _____ day of _____, 2025 at their regularly scheduled meeting.

JNRU Utility Board

_____
Brian Hatfield, President

_____
Marshall Jenkins, Vice President

_____
Michael Gerth, Secretary/Treasurer

_____
Judi Johnson-Stevens, Member

_____
Dale Boyd, Member

Attest: _____

State Revolving Fund Loan Program
Asset Management Program Certification Form
Inclusive of
Fiscal Sustainability Plan Certification

(To be submitted either at the time of loan closing or no later than the final disbursement of a Participant's loan proceeds)

Participant Name: Jennings Northwest Regional Wastewater Utility		
Street Address: 3847 Country Manor St	P. O. Box Number: NA	
City: North Vernon	State: Indiana	Zip Code: 47265

Indiana Code 5-1.2-10-16 requires a Participant that receives a loan or other financial assistance from the State Revolving Fund Loan Program (SRF) to certify that the Participant has documentation demonstrating it has the financial, managerial, technical and legal capability to operate and maintain its water or wastewater collection and treatment system. A Participant must demonstrate that it has developed an asset management program as defined in the Indiana Finance Authority's (Authority) Asset Management Program Guidelines.

Section 603(d)(1)(E) of the Federal Water Pollution Control Act (FWPCA) requires a recipient of a loan for a project that involves the repair, replacement, or expansion of a publicly owned treatment works to develop and implement a Fiscal Sustainability Plan (FSP). The requirement pertains to those portions of the treatment works paid for with Clean Water SRF Loan Funds.

The Asset Management Program (AMP) shall be inclusive of the requirements of the FSP for Wastewater and Drinking Water projects and shall include at a minimum the following: (1) A system map (2) An inventory and assessment of system assets (3) development of an infrastructure inspection, repair, and maintenance plan, including a plan for funding such activities (4) an evaluation and implementation of water and energy conservation efforts (5) An analysis of the customer rates necessary to support the AMP (6) Audit performed at least every two years (7) Cyber Vulnerability Assessment performed at least annually (8) Demonstration of the technical, managerial, legal and financial capability to operate and maintain the system, per the guidelines established by the Authority.

I hereby certify that I am an authorized representative for the above listed Participant and pursuant to IC 5-1.2-10-16 and Section 603(d)(1)(E), the Participant has developed and is implementing an AMP (inclusive of the requirements of an FSP) that meets the requirements established by the Authority. Upon the request of the Environmental Protection Agency (EPA) or the Indiana SRF, the Participant agrees to make the AMP (which includes the FSP requirements) available for inspection and/or review.

Participant's estimated capital asset needs in the next 5 years: $30,200,000
Estimated annual operation, maintenance and replacement costs for assets financed: $474,000
Pursuant to Indiana Code 5-1.2-10-16, upon request by the IFA, actual operation, maintenance and replacement costs for assets financed shall be provided.

Brian Hatfield	3/28/2025
Signature of Authorized Representative	Date
Brian Hatfield, Board President	765-346-5500, brianhatfield1959@icloud.com
Printed Name	Phone Number/Email Address

Section Eight – Public Participation

8.1 Introduction

To encourage public participation and ensure the community is informed and has the opportunity to discuss the proposed project, the Jennings Northwest Regional Utilities (JNRU) along with the Jennings County Board of Commissioners will hold a public hearing on April 15, 2025 for the purpose of discussing the proposed wastewater system improvements. A copy of the PER describing the proposed project will be available to all attendees at the hearing, as well as 10 days prior to the hearing.

8.2 Public Hearing

The public hearing will be publicized in the local newspaper a minimum of 10 days prior to the date of the hearing. The notice will state when and where the hearing will be held and what will be discussed. It will also state the PER will be available for public review prior to the hearing, as well as where and when the PER can be reviewed. Additionally, the notice will state that written comments will be accepted at the public hearing and for five days after the hearing.

A copy of the public hearing notice from the newspaper and the publisher's affidavit will be included in this report in **Appendix D** once available.

A sign-up sheet will be available at the public hearing for all individuals interested in receiving the CE/FNSEI, EA/FNSEI or EIS/ROD or environmental documents. The sign-up sheet from the public hearing as well as meeting minutes will also be included in **Appendix D** once available.

The public will be informed that JNRU and the County Commissioners will receive comments and questions regarding the PER for 5 days following the public hearing.